



12th AACR Conference on

THE SCIENCE OF CANCER HEALTH DISPARITIES IN RACIAL/ETHNIC MINORITIES AND THE MEDICALLY UNDERSERVED

IN ASSOCIATION WITH THE AACR MINORITIES IN CANCER RESEARCH COUNCIL

September 20-23, 2019 | Hilton San Francisco Union Square | San Francisco, CA

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Dear Colleagues,

On behalf of the American Association for Cancer Research and the Minorities in Cancer Research Council of the AACR, it is our pleasure to welcome you to San Francisco for the **12th AACR Conference on The Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved**.

We are all here because of our passion for reducing or eliminating the cancer burden in racial/ethnic minorities and the medically underserved. This conference provides a perfect venue to discuss basic, population, clinical, and transdisciplinary research related to health disparities in cancer. We are grateful to the 19 members of the Program Committee for their expert assistance in developing the scientific program for this conference. We also thank the Scientific Review Committee for reviewing the 537 submitted abstracts, the most submitted in the history of the conference!

We are honored to have Dr. Lisa C. Richardson, Director of CDC's Division of Cancer Prevention and Control (DCPC), join us to present her keynote lecture during our opening session. Our opening session will also feature the Tenth Annual AACR Distinguished Lectureship on the Science of Cancer Health Disparities.

Important scientific updates will be covered, and provocative questions will be raised during the plenary sessions and concurrent sessions. This year we are pleased to once again highlight the important role of advocates and the community in cancer health disparities research, and the conference features advocate speakers in several sessions. Two educational sessions will dive into geospatial and multilevel analyses, as well as disparities in therapeutic outcomes. Our concurrent sessions will discuss border health challenges, cancer prevention in middle-income countries, new approaches to omics and big data, and cancer center-led community outreach and engagement. This year two special *Hot Topics in Cancer Health Disparities* sessions will feature the top submitted abstracts and highlight groundbreaking research from some of the most innovative abstracts submitted for this year's conference.

The AACR extends its thanks to the National Cancer Institute Center to Reduce Cancer Health Disparities and Janssen for their general support of this meeting. In addition, we extend our thanks again to the National Cancer Institute Center to Reduce Cancer Health Disparities, and the AACR, for providing travel awards for this conference. Finally, we would like to thank Astellas, Daiichi Sankyo, Genentech, Lilly, Novartis, Pfizer, and TESARO for their support of our Professional Educational Grants.

We are pleased that this meeting continues to provide a forum to identify risk factors and barriers to the reduction and elimination of cancer health disparities. We feel confident that you will find this to be an exciting and engaging meeting, and we look forward to your participation.

With best wishes for an outstanding meeting,



Laura Fejerman, Chair



Smita Bhatia, Cochair



Phyllis Pettit Nassi, Cochair



Sandi L. Pruitt, Cochair



Mariana C. Stern, Cochair



Clayton C. Yates, Cochair



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Atlanta, GA

Jovanny Zabaleta, Louisiana State University School of
Medicine, New Orleans, LA

2019-2020 AACR Distinguished Lecture on the Science of Cancer Health Disparities Selection Committee

Gerardo Colón-Otero, Mayo Medical School. Mayo Clinic,
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Institute, Salt Lake City, UT

Anna R. Giuliano, H. Lee Moffitt Cancer Center and Research
Institute, Tampa, FL

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New York, NY

Augusto C. Ochoa, Louisiana State University Health Sciences
Center-Stanley S. Scott Cancer Center, New Orleans, LA

Ana Patricia P. Ortiz- Martínez, University of Puerto Rico,
San Juan, PR

Gloria M. Petersen, Mayo Clinic College of Medicine,
Rochester, MN

Nimmi Ramanujam, Duke University, Durham, NC

Mariana C. Stern, USC Norris Comprehensive Cancer Center,
Los Angeles, CA

Cornelia M. Ulrich, Huntsman Cancer Institute, Salt Lake City,
UT

Jeffrey N. Weitzel, Cancer Screening and Prevention Program
Network, City of Hope, Duarte, CA

Jennie L. Williams, Stony Brook University, Stony Brook, NY

Cheryl L. Willman, University of New Mexico Comprehensive
Cancer Center, Albuquerque, NM



AWARDS

Scholar-in-Training Awards

Forty-four presenters of meritorious abstracts have been selected by the Conference Chairs to receive an award to attend this conference. All graduate and medical students, postdoctoral fellows, and physicians-in-training who are AACR members were eligible for consideration. The names of the Scholar-in-Training awardees, affiliations, and poster numbers are provided below.

AACR Scholar-in-Training Awards— Supported by AACR

Shakir Ahmed, Tuskegee University, Tuskegee, AL, B062

Prachi Bajpai, University of Alabama at Birmingham, Birmingham, AL, C044

Susanna Basappa, Mayo Clinic, Rochester, MN, C099

Rania Bassiouni, University of Southern California, Los Angeles, CA, B088, PR13

Robert-Marlo Bautista, University of Kentucky, Lexington, KY, A126

Alem Belachew, The University of Texas MD Anderson Cancer Center, Houston, TX, B097, PR04

Halei Benefield, University of North Carolina-Chapel Hill, Chapel Hill, NC, C045

Yaelin Caba Silverio, Icahn School of Medicine, New York, NY, A101

Leslie Carnahan, University of Illinois at Chicago, Chicago, IL, D032

Kelsey Corrigan, Duke University School of Medicine, Durham, NC, A043

Burcu Darst, Keck School of Medicine, University of Southern California, Los Angeles, CA, A068, PR01

Rohit Gosain, Roswell Park Comprehensive Cancer Center, Buffalo, NY, A054

Wayne Lawrence, University at Albany, State University of New York, Albany, NY, A106

Marquita Lewis-Thames, Washington University in St. Louis School of Medicine, St. Louis, MO, A014, A015

Nicole Lorona, University of Washington, Seattle, WA, B106

Maret Maliniak, Emory University, Atlanta, GA, C074

Rachel Martini, Weill Cornell Medical College, New York, NY, B107

Joakin Mori, Tuskegee University, Tuskegee, AL, B072, PR02

Michelle Naidoo, Graduate Center of the City University of New York, New York, NY, B090

Mary Nittala, University of Mississippi Medical Center, Jackson, MS, B126, C016

Chelsea Obrochta, San Diego State University/University of California, San Diego, San Diego, CA, D077

Carol Ochoa, University of Southern California, Los Angeles, CA, A129

Gargi Pal, Hunter College, CUNY, New York, NY, B074

Margaret Pichardo, Yale School of Public Health, New Haven, CT, C076

Ricardo Ramirez, Washington University in St. Louis, St. Louis, MO, A003

Daniela Ramirez Aguilar, Fay Boozman College of Public Health, University of Arkansas for Medical Sciences, Little Rock, AR, C034, PR14

Andrea Riner, University of Florida, Gainesville, FL, B109

Anas Saad, Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio, B110

Yazmin San Miguel, University of California San Diego, San Diego, CA, B128

María Carolina Sanabria-Salas, Instituto Nacional de Cancerología, Bogotá, Columbia, B058

Janeth Sanchez, University of Washington, Seattle, WA, A058

Jason Semprini, University of Chicago, Chicago, IL, B059

Shaila Strayhorn, University of Illinois at Chicago, Chicago, IL, D024, D025

Zoe Underhill, Universidad Central del Caribe, Bayamon, PR, B113

Ana I Velazquez, University of California San Francisco, San Francisco, CA, C043, D134

Carol Wang, The University of Texas MD Anderson Cancer Center, Houston, TX, A060

Jason White, Tuskegee University, Tuskegee, AL, B079, PR12

Randi Williams, Georgetown University, Washington, DC, B054

Serena Xiong, University of Minnesota School of Public Health, Minneapolis, MN, B048

Melody Xu, University of California San Francisco, San Francisco, CA, A133

Annie Yang, Rutgers New Jersey Medical School, Newark, NJ, C018

Corey Young, Morehouse School of Medicine, Atlanta, GA, A110

Valentina Zavala, University of California San Francisco, San Francisco, CA, B080

Lin Zhu, Center for Asian Health, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, C079, C080

Minority and Minority-Serving Institution Faculty Scholar in Cancer Research Awards

Full-time minority faculty and faculty of Minority-Serving Institutions (Historically Black Colleges and Universities [HBCUs], Hispanic-Serving Institutions [HSIs], American Indian Tribally-Controlled Colleges and Universities [AITCCUs], and other postsecondary institutions as defined by the U.S. Department of Education) who present a proffered paper at this conference are encouraged to apply for this meritorious scholar award. Supported by a generous grant from the Center to Reduce Cancer Health Disparities of the National Cancer Institute, the purposes of these awards are to increase the scientific knowledge base of minority faculty and faculty at MSIs, to encourage them in their research, and to assist in inspiring their students to pursue careers in cancer research. Only citizens of the United States or Canada or scientists who are permanent residents of these countries may receive one of these awards. The names of the Minority and Minority-Serving Institution Faculty Scholars, affiliations, and their poster or proffered presentation numbers are provided below.

Vivian Colon Lopez, PhD, Professor, Univ. of Puerto Rico Cancer Center Control and Pop Science, San Juan, PR

Abstract Title: Content analysis of online media coverage of the human papillomavirus vaccine as a school-entry policy in Puerto Rico

Poster Number: D045

Albert J. Farais, PhD, Assistant Professor, Keck School of Medicine of the University of Southern CA, Los Angeles, CA

Abstract Title: Racial/ethnic disparities in weight, weight-change in adulthood and pancreatic cancer incidence: The Multiethnic Cohort

Poster Number: C071

Raymond W. Hughley, PhD, Data Analyst, Mount Sinai School of Medicine, New York, NY

Abstract Title: The impact of ancestry on mutational and immune signatures in triple-negative breast cancers

Poster Number: B105

Balasubramanyam Karanam, PhD, Assistant Professor, Tuskegee Univ., Tuskegee, AL

Abstract Title: Targeting ubiquitin receptor ADRM1 for the treatment of quadruple-negative breast cancer

Poster Number: D051

Gilberto Lopez, ScD, Assistant Professor, University of Rochester Medical Ctr., Rochester, NY

Abstract Title: Race, place, and smoking in rural America across four categories of an urban/rural continuum: Evidence from the Health Information National Trends Survey (HINTS)

Poster Number: A016

Michelle M. Martinez-Montemayor, PhD, Associate Professor, Universidad Central del Caribe-School of Medicine, Bayamon, PR

Abstract Title: Unique hormone receptor signatures of inflammatory breast cancer in a cohort of Puerto Rican women

Poster Number: B113

Yamile Molina, PhD, Assistant Professor, University of Illinois, Chicago, IL

Abstract Title: Empowering Latinas to obtain breast cancer screenings: Comparing interventions' behavioral and network effects

Poster Number: B011

AWARDS

Lynette A. Ruiz, PhD, Assistant Professor, Ponce Health Sciences University, Ponce, PR

Abstract Title: Prevalence of human papillomavirus infection in a sample of 21- to 29-year-old women living in Puerto Rico
Poster Number: C127

Danyell S. Wilson-Howard, PhD, Associate Professor, Bethune-Cookman University, Daytona Beach, FL

Abstract Title: Community engagement in the development of an m-health app utilizing a black male virtual health assistant (VHA) to promote colon cancer screening: An iterative study of credibility and likeability
Poster Number: A041

AACR-MICR Minority Scholar Awards in Cancer Research

Presenters of a proffered paper who are full-time predoctoral (graduate or medical) students, residents, and clinical or postdoctoral fellows who are engaged in cancer research or have the training and potential to make contributions to this field are encouraged to apply for this meritorious scholar award. Supported by a generous grant from the Center to Reduce Cancer Health Disparities of the National Cancer Institute, this program applies only to racial/ethnic minority groups that have been identified by the NCI as being traditionally under-represented in cancer and biomedical research, i.e., African American/Black, Alaskan Native, Hispanic/Latino, Native American, and Native Pacific Islander. Only citizens of the United States or Canada or scientists who are permanent residents of these countries may receive one of these awards. The names of the Minority Scholars, affiliations, and their poster or proffered presentation numbers are provided below.

Joycemary G. Amponsem, BS, Medical Student, Meharry Medical College, Nashville, TN

Abstract Title: Does insurance status explain the racial disparity in survival outcome seen in upper aerodigestive tract cancers in the United States?
Poster Number: A100

Portia L. Andrews, BS, Graduate Student, North Carolina Central University, Durham, NC

Abstract Title: Evaluating the ability of clinically approved chemotherapeutics to decrease race-associated breast cancer mortality disparities via targeting the tumor promoting effect of Crystallin Beta B2.
Poster Number: B116

Glizette O. Arroyo-Morales, BS, Graduate Student, Comprehensive Cancer Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Abstract Title: Arguments in favor and against the new HPV school entry implementation in Puerto Rico: Content analysis of online media coverage
Poster Number: D030

Sydney M. Cadiz, BA, Medical Student, Meharry Medical College, Nashville, TN

Abstract Title: Assessing knowledge of genetic testing for inherited cancer among registry-based young black breast cancer survivors and predominantly non-Hispanic white clinic-based patients
Poster Number: B056

Danielle A. Cerbon, MD, Medical Student, Sylvester Comprehensive Cancer Center, University of Miami, Miller School of Medicine, Miami, FL

Abstract Title: Intra-Caribbean Island differences drive breast cancer outcomes in US Caribbean-immigrant women compared to US-born Black women
Poster Number: B098

Megan C. Edmonds, MPH, Postdoctoral Fellow, Virginia Commonwealth University, Richmond, VA

Abstract Title: Surveillance mammography and follow-up care in Black and White breast cancer survivors
Poster Number: C107

Jason Garcia, BS, Graduate Student, University of Illinois, Chicago, IL

Abstract Title: Regulation of megalin by vitamin D as the mechanism for differential levels of intra-prostatic androgens between African American and Caucasian men
Poster Number: B094

Vanessa Gomez-Vargas, MS, Graduate Student, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Abstract Title: Cervical cancer survival analysis based on screening practices and the socioeconomic position index in Puerto Rico
Poster Number: C023

Jamal Jarrett, MPH, Medical Student, Medical College of Wisconsin, Wauwatosa, WI

Abstract Title: Developing Men Moving Forward, a lifestyle intervention for African American prostate cancer survivors
Poster Number: B006

Kimberley T. Lee, MD, Clinical Fellow, Johns Hopkins Sidney Kimmel Cancer Center, Baltimore, MD

Abstract Title: Racial disparities in delayed initiation of adjuvant endocrine therapy among patients with breast cancer

Poster Number: A136

Nikta N. Lovelady, DPhil, MPH, Postdoctoral Fellow, University of Arkansas for Medical Sciences, Little Rock, AR

Abstract Title: Using qualitative methods to develop health messages aimed to reduce secondhand smoke exposure among African American breast cancer survivors in a rural state

Poster Number: A018

Nita H. Mukand, MBA, Graduate Student, University of Illinois at Chicago College of Pharmacy, Chicago, IL

Abstract Title: Racial differences in the risks of second primary gynecologic cancers following chemotherapy for malignant ovarian tumors: Asian subgroups in the United States, 2000-2016

Poster Number: C020

Mayra Serrano, MPH, Graduate, Student, City of Hope, Duarte, CA

Abstract Title: Understanding the cancer needs of LGBTQ Latinx communities

Poster Number: C092

Sabrina L. Smiley, MPH, Postdoctoral Fellow, University of Southern California, Los Angeles, CA

Abstract Title: "Let me smoke that": Exploring combustible tobacco use and smoking cessation behavior among sexual minority young adult smokers in Washington, DC

Poster Number: A022

Derek L. Wagner, MS, Medical Student, Meharry Medical College, Nashville, TN

Abstract Title: The salivary proteome of African American and white American males diagnosed with laryngeal cancer

Poster Number: D129

AACR-Women in Cancer Research (WICR) Awards

The AACR is very pleased to administer this important program, which provides funds for the participation of early-career, meritorious scientists. Scholars are selected on the basis of their qualifications, references from mentors, and an estimation of the potential professional benefit to the awardees. Awards are funded by the AACR. The names and affiliations of the Women in Cancer Research Scholars, affiliation, and their poster or proffered presentation numbers are provided below.

Rachisan G. Djiake Tihagam, BS, Graduate Student, University of Virginia School of Med, Charlottesville, VA

Abstract Title: Oncogenic TRIM37 is a genetic determinant of racial disparity in TNBC patients

Poster number: A096

Ugonna A. Ihenacho, MPH, Graduate Student, University of Southern California, Los Angeles, CA

Abstract Title: Lifetime cigarette smoking and breast cancer risk in young women: Racial and socioeconomic disparities in risk in the Young Women's Health History Study

Poster number: A112

Catherine M. Pichardo, MA, Graduate Student, University of Illinois, Chicago, IL

Abstract Title: Estimating the costs and cost-effectiveness of promoting mammography screening among US-based Latinas

Poster number: B019

Vilnery Rivera-Figueroa, BS, Graduate Student, Comprehensive Cancer Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Abstract Title: Content analysis of online media coverage of the human papillomavirus vaccine as a school-entry policy in Puerto Rico

Poster number: D045

Nelybeth Santiago-Yance, MS, Graduate Student, Comprehensive Cancer Center, University of Puerto Rico Medical Sciences Campus, San Juan, PR

Abstract Title: Racial/ethnic disparities in awareness and attitudes towards the HPV vaccine among women living in the United States and Puerto Rico

Poster number: C091

disparities and provide the most appropriate care for a diverse patient population.

After participating in this CME activity, physicians should be able to:

1. Discuss the environmental, biologic, and genetic contributions to racial disparities in cancer risk and incidence
2. Assess the efficacy of various interventional approaches in specific populations to decrease cancer health disparities
3. Identify the impact of genetic susceptibility, socioeconomic factors, diet, and access to health care in the prevention and treatment of cancer
4. Identify factors that impact the development and treatment of cancers in patients from different populations
5. Distinguish how screening practices, testing, and biologic factors impact the survivorship and quality of life in cancer survivors from underserved populations

Disclosure Statement

It is the policy of the AACR that the information presented at AACR CME activities will be unbiased and based on scientific evidence. To help participants make judgments about the presence of bias, AACR will provide information

that Scientific Program Committee members and speakers have disclosed about financial relationships they have with commercial entities that produce or market products or services related to the content of this CME activity. This disclosure information will be made available in the Program/Proceedings of this conference.

Acknowledgment of Financial or Other Support

This activity is supported by Professional Educational Grants from Astellas, Daiichi Sankyo, Genentech, Lilly, Novartis, Pfizer, and TESARO. Any others will be disclosed at the activity.

Questions about CME?

Please contact the Office of CME at 215-440-9300 or cme@aacr.org.



SUPPORTERS AND GRANTS *as of August 14, 2019

The AACR would like to thank the following organizations
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The AACR thanks the following organizations
for their generous support of the travel awards provided at this conference.

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CONFERENCE PROGRAM AND SCHEDULE

Friday, September 20

4:00 p.m.-5:45 p.m. **Welcome and Opening Session**
Continental Ballroom 5 & 6

Keynote Address

It doesn't have to be this way: What is public health doing to address health equity in cancer?



Lisa C. Richardson, MD, MPH
Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA

Lisa Richardson, MD, MPH, serves as the Director of the Division of Cancer Prevention and Control in the National Center of Chronic Disease Prevention and Health Promotion at the CDC. She is responsible for providing leadership and direction for all scientific, policy, and programmatic issues related to four national programs: the Colorectal Cancer Control Program, the National Breast and Cervical Cancer Early Detection Program, the National Comprehensive Cancer Control Program, and the National Program of Cancer Registries. She oversees a well-developed research agenda that includes the national Cancer Prevention and Control Research Network. Her research focuses on access to cancer care, systems of care, health-related quality of life during cancer treatment, health disparities, and breast cancer treatment patterns of care.

Dr. Richardson graduated from the University of North Carolina in 1989 and completed internship, residency, and fellowship training at the University of Florida. In addition, she received her master's degree in epidemiology from the University of Michigan in 1997.

Distinguished Lecturer Series

Title to be announced



Steven Patierno, PhD
Deputy Director, Duke Cancer Institute

Steven Patierno, PhD, is honored for his research, which has had a far-reaching impact on the understanding of the social, structural, and biologic determinants of cancer health disparities. He is revered for his

discovery of race-related alternative RNA splice variants and the identification of novel, aberrant, and actionable molecular pathways specific to cancers in African American patients. Furthermore, Dr. Patierno is recognized for correlating the expression of these molecular insults with poor survival outcomes associated with various cancers such as breast, colon, and prostate cancer in minority patient populations. In addition to these discoveries, Dr. Patierno is recognized for his significant contributions to clinical patient care as his extensive health care delivery research has demonstrated that comprehensive patient navigation efforts are able to effectively mitigate cancer disparities when administered at the onset of cancer screening and diagnosis and throughout treatment and survivorship. For more information visit AACR.org/SAA.

5:45 p.m.-6:45 p.m. **MICR Council Meet and Greet**
South Lounge 2

6:45 p.m.-8:45 p.m. **Poster Session A / Opening Reception**
Yosemite and Imperial

Saturday, September 21

8:00 a.m.-8:55 a.m. **Continental Breakfast and Professional Networking Roundtables**
Yosemite and Imperial

9:00 a.m.-10:30 a.m. **Plenary Session 1: Cancer Health Disparities—Using Science to Inform Tobacco Policy**
Continental Ballroom 5 & 6

Session Chairs: **John M. Carethers**, University of Michigan, Ann Arbor, MI, and **Electra D. Paskett**, Ohio State University Comprehensive Cancer Center, Columbus, OH

Science to policy for a ban on the sale of menthol and flavored tobacco products: The San Francisco Cancer Initiative (SF CAN)
Robert A. Hiatt, University of California San Francisco, Helen Diller Family Comprehensive Cancer Center, San Francisco, CA

Title to be announced
Brian A. King, Office on Smoking and Health, Center for Disease Control and Prevention, Atlanta, GA

Title to be announced
Eliseo J. Pérez-Stable, National Institute on Minority Health and Health Disparities, Bethesda, MD

10:30 a.m.-11:00 a.m. **Break**
East Lounge

11:00 a.m.-12:30 p.m. **Plenary Session 2: Cancer Health Disparities in the LGBTQ Community**
Continental Ballroom 5 & 6

Session Chairs: **Madina Agénor**, Tufts University, Boston, MA, and **Liz Margolies**, National LGBT Cancer Network, New York, NY

Sexual orientation, race/ethnicity, and human papillomavirus vaccination disparities among young U.S. women: An intersectional approach
Madina Agénor

What do we know about sexual minorities and cancer and where do we go from here?
Ulrike Boehmer, Boston University, Boston, MA

Cancer survivorship among sexual minority people: Health, interventions, and next steps
Jennifer Jabson Tree, University of Tennessee, Knoxville, TN

Health care disparities experienced by LGBTQ patients facing terminal cancer
Shail Maingi, St. Peter's Health Partners, Troy, NY

12:30 p.m.-2:00 p.m. **MICR Professional Advancement Session (Lunch on own for those not attending)**
Continental Ballroom 4

2:00 p.m.-3:00 p.m. **Concurrent Sessions 1 and 2**
Concurrent Session 1: Border Health: Challenges and Opportunities for Control of Cancer Disparities
Continental Ballroom 5 & 6

Session Chair: **Shobha Srinivasan**, National Cancer Institute, Bethesda, MD

Border health overview: Challenges and opportunities
Amy Elizondo, National Rural Health Association, Washington, DC

Border health Consortium of the Californias
Prisci Quijada, California Department of Public Health, Sacramento, CA
Jesse Nodora, University of California San Diego, San Diego, CA

Colorectal cancer mortality along the U.S.-Mexico border
Caitlin Murphy, University of Texas Southwestern Medical Center, Dallas, TX

Cancer disparities and survivorship challenges facing young Latina women (< 50 years) on the U.S.-Mexico border
Rebecca Palacios, New Mexico State University, Las Cruces, NM

CONFERENCE PROGRAM AND SCHEDULE

Concurrent Session 2: Comprehensive Cancer Prevention Initiatives in Low- and Middle-Income Country Settings: What Does It Take?

Continental Ballroom 4

Session Chairs: **Lisa A. Newman**, Weill Cornell Medicine, New York, NY, and **Andrea S. Llera**, Instituto Leloir, Buenos Aires, Argentina

Introduction of HPV self-collection in Argentina, main results, and lessons

Silvina Arrossi, CEDES-Centro de Estudios de Estado y Sociedad, CABA, Argentina

Colorectal cancer prevention and screening in Nigeria

T. Peter Kingham, Memorial Sloan Kettering Cancer Center, New York, NY

Breast cancer screening opportunities in sub-Saharan Africa

Alice Chong, RAD-AID International, Philadelphia, PA

3:00 p.m.-3:30 p.m.

Break

East Lounge

3:30 p.m.-5:30 p.m.

Hot Topics in Cancer Health Disparities 1

Continental Ballroom 5 & 6

Session Chairs: **Steven R. Patierno**, Duke University School of Medicine, Durham, NC, and **Renee Reams**, Florida A&M University, Tallahassee, FL

The four-kallikrein panel discriminates prostate cancer and aggressive disease in a multiethnic population*

Burcu Darst, Keck School of Medicine, University of Southern California, Los Angeles, CA

Identification of mechanisms of resistance to enzalutamide treatment using in vitro castration-resistant prostate cancer models*

Joakin Mori, Tuskegee University, Tuskegee, AL

Disaggregation of gastric cancer risk between Asian American subgroups*

Robert Huang, Stanford University School of Medicine, Stanford, CA

Understanding outcome disparities in multiple myeloma: A multiethnic comparison of clinical characteristics in Hispanics*

Alem Belachew, The University of Texas MD Anderson Cancer Center, Houston, TX

A meta-analysis of genome-wide association study and eQTL analysis of multiple myeloma among African Americans*

Wendy Cozen, Keck School of Medicine, University of Southern California, Los Angeles, CA

Exposure to phthalates and risk of invasive breast cancer: The multiethnic cohort study*

Anna Wu, University of Southern California, Los Angeles, CA

Lung cancer incidence and risk factors in never-smoking Asian American, Native Hawaiian, and Pacific Islander women: A multilevel dataset of electronic health record, cancer registry, and environmental data*

Mindy DeRouen, University of California San Francisco, San Francisco, CA

Neighborhood-level social determinants impact non-small cell lung cancer aggressive somatic phenotypes*

Loretta Erhunmwunsee, City of Hope, Duarte, CA

5:30-7:30 p.m.

Poster Session B / Reception

Yosemite and Imperial

7:30 p.m.

Evening Off / Dinner on Own

*Short talk from proffered abstract

Sunday, September 22

8:00 a.m.-8:55 a.m. **Continental Breakfast and Professional Networking Roundtables**
Yosemite and Imperial

8:00 a.m.-9:00 a.m. **Addressing Advocacy at the Bench: Implementing Change**
Not eligible for CME credit
Continental Ballroom 8

Populations at risk for health disparities are less likely than other groups to participate in research studies. This gap in research participation threatens to increase health inequities, as cancer research studies drive the development of new and improved treatments. Researchers and advocates are combating this issue by co-creating patient engagement efforts that promise to increase patient participation in cancer research. This session will highlight case studies of community-based initiatives, developed and implemented by teams of patients and researchers, working together to reduce and eliminate research and health disparities.

Panel members:

Phyllis Pettit Nassi (moderator), Huntsman Cancer Institute, SSP Advocate

Panelist 1: Lola Fashoyin-Aje, U.S. Food and Drug Administration, Silver Spring, MD

Panelist 2: Candance Henley, Blue Hat Foundation, Chicago, IL, SSP Advocate

Panelist 3: Nynikka Palmer, University of California San Francisco, San Francisco, CA

Panelist 4: Jamie Brewer, U.S. Food and Drug Administration, Silver Spring, MD

9:00 a.m.-10:30 a.m. **Plenary Session 3: Cancer Health Disparities in California**
Continental Ballroom 5 & 6

Session Chairs: **Rick A. Kittles**, City of Hope, Duarte, CA, and **Dennis Deapen**, University of Southern California, Los Angeles, CA

Overview of cancer and unique disparities among American Indian and Alaska Natives in California

Claradina Soto, Keck School of Medicine, University of Southern California, Los Angeles, CA
Kori Novak, Toiyabe Indian Health Clinic, Bishop, CA

Observations and implications from examining cancer incidence rates and trends of ethnic Asian Americans

Lihua Liu, University of Southern California, Los Angeles, CA

The unnecessary epidemic: Skin cancer in Hispanics and what we need to do about it

Myles G. Cockburn, University of Southern California, Los Angeles, CA

Title to be announced

Valerie Yerger, University of California San Francisco, San Francisco, CA

10:30 a.m.-11:00 a.m. **Break**
East Lounge

11:00 a.m.-12:30 p.m. **Plenary Session 4: Addressing Multilevel Factors, from Genomics to Environment, in Prostate Cancer Disparities among African American Men**
Continental Ballroom 5 & 6

Session Chairs: **Graham Colditz**, Washington University School of Medicine, St. Louis, MO, and **Gary L. Ellison**, National Cancer Institute, Bethesda, MD

Title to be announced

John D. Carpten, Keck School of Medicine, University of Southern California, Los Angeles, CA

Social factors and prostate cancer disparities in African American men

Scarlett Lin Gomez, University of California San Francisco, San Francisco, CA

CONFERENCE PROGRAM AND SCHEDULE

A comprehensive and integrated approach to identify factors associated with aggressive prostate cancer in African-Americans: The RESPOND Study

Ann S. Hamilton, Keck School of Medicine, University of Southern California, Los Angeles, CA

12:30 p.m.-2:30 p.m. Poster Session C / Lunch
Yosemite and Imperial

2:30 p.m.-3:30 p.m. Educational Sessions 1 and 2

Educational Session 1: Geospatial and Multilevel Analyses Applied to Cancer Health Disparities

Continental Ballroom 4

Session Chair: Sandi L. Pruitt, University of Texas Southwestern Medical Center, Dallas, TX

Housing discrimination and cancer disparities research: How are key decisions made?

Kirsten Beyer, Medical College of Wisconsin, Milwaukee, WI

Spatial epidemiology and cancer research

Dustin T. Duncan, NYU School of Medicine, New York, NY

Using cancer registry data for geospatial and disparity research

Recinda Sherman, North American Association of Central Cancer Registries, Springfield, IL

Educational Session 2: Disparities in Therapeutic Outcomes and Prevalence of Adverse Effects

Continental Ballroom 5 & 6

Session Chair: M. Eileen Dolan, University of Chicago, Chicago, IL

Metformin use and pancreatic cancer survival: Are there racial differences?

Adetunji T. Toriola, Washington University School of Medicine, St. Louis, MO

Breast tumor microenvironment in black women: A distinct signature of CD8+ T-cell exhaustion

Song Yao, Roswell Park Comprehensive Cancer Center, Buffalo, NY

Disparities in cardiovascular disease incidence in breast cancer survivors

Zaixing Shi, Fred Hutchinson Cancer Research Center, Seattle, WA

Advocate perspective

Desiree A. H. Walker, SHARE Cancer Support, New York, NY

3:30 p.m.-4:30 p.m. Concurrent Sessions 3 and 4

Concurrent Session 3: Cancer Center-Led Community Outreach and Engagement at NCI Cancer Centers

Continental Ballroom 4

Session Chair: Lourdes Baezconde-Garbanati, University of Southern California Norris Comprehensive Cancer Center, Los Angeles, CA

Population-level problems require system-level solutions: Using collective impact approaches to solving cancer disparities

Kim Rhoads, UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA

Collaboration to address cancer health disparities among Asian Americans and Latinos in Orange County, CA

Sora Park Tanjasiri, University of California, Irvine, Irvine, CA

Innovative strategies for outreach and engagement to reduce cancer disparities. Working with and for Latinos, African Americans, and other at-risk populations

Lourdes Baezconde-Garbanati

Concurrent Session 4: New Approaches to Omics and Other Big Data

Continental Ballroom 5 & 6

Session Chair: Melissa B. Davis, Weill Cornell Medical College, New York, NY

Molecular characterization of sessile serrated adenoma/polyps: A risk factor for higher colorectal cancer that further associates with endometrial polyps in female African Americans

Hassan Ashktorab, Howard University, Washington, DC

The impact of ancestry on mutational signatures in populations with African ancestry

Paz Polak, Icahn School of Medicine at Mount Sinai, New York, NY

Precision medicine at Weill Cornell Medicine/New York Presbyterian: Breaking silos, integrating resources, being inclusive

Andrea Sboner, Weill Cornell Medicine, New York, NY

4:30 p.m.-6:30 p.m. **Poster Session D**
Yosemite and Imperial

6:30 p.m. **Evening Off / Dinner on Own**

Monday, September 23

8:00 a.m.-8:55 a.m. **Continental Breakfast and Professional Networking Roundtables**
Golden Gate Rooms

9:00 a.m.-11:00 a.m. **Hot Topics in Cancer Health Disparities 2**
Continental Ballroom 5 & 6

Session Chairs: Gerardo Colon-Otero, Mayo Clinic Cancer Center, Jacksonville, FL and **Julie Dutil**, Ponce Health Sciences University, Ponce, PR

Racial disparities in health insurance status of U.S. adults with hematologic malignancies in states with and without Medicaid expansion: Analyses from the National Cancer Database, 2007-2016*

Gregory Calip, University of Illinois at Chicago, Chicago, IL

Emergency department-mediated cancer diagnosis in the United States*

Caroline Thompson, San Diego State University, San Diego, CA

Development of a prostate cancer care and survivorship intervention trial for ethnically diverse Black men*

Folakemi Odedina, University of Florida, Orlando, FL

Using whole-exome sequencing of archived FFPE tissue to characterize the mutational landscape of prostate cancer in Nigerian men*

Jason White, Tuskegee University, Tuskegee, AL

Loss of alpha-catenin expression is associated with race, aggressive disease, and chemoresistance in triple-negative breast cancer*

Rania Bassiouni, University of Southern California, Los Angeles, CA

Dietary folate and prostate cancer tumor aggressiveness differences between African Americans and European Americans*

Daniela Ramirez Aguilar, University of Arkansas for Medical Sciences, Little Rock, AR

Intratumoral heterogeneity in Latino gastric adenocarcinomas*

Luis Carvajal Carmona, University of California Davis, Davis, CA

Association of renal cell carcinoma subtypes with race/ethnicity and comorbid medical conditions*

Iona Cheng, University of California San Francisco, San Francisco, CA

11:00 a.m.-11:30 a.m. **Break**
East Lounge

11:30 a.m.-1:00 p.m. **Plenary Session 5: Cancer Disparities in Children and AYA**
Continental Ballroom 5 & 6

Session Chair: Elizabeth Gage-Bouchard, Roswell Park Comprehensive Cancer Center, Buffalo, NY

Disparities in AYA oncology: The role of treatment site
Julie Wolfson, University of Alabama-Birmingham School of Medicine, Birmingham, AL

Survival by race and ethnicity in pediatric and adolescent patients with Hodgkin lymphoma: A report from the Children's Oncology Group

Justine Kahn, Columbia University, New York, NY

What causes the increased risk of acute lymphoblastic leukemia in Latinos?

Adam de Smith, Keck School of Medicine, University of Southern California, Los Angeles, CA

Inspiring hope, help, and healing: The hard work and heart work of cancer survivorship

Jameisha (Meisha) Brown, Texas A&M University, College Station, TX; Emory Candler School of Theology, Atlanta, GA

**Short talk from proffered abstract*

CONFERENCE PROGRAM AND SCHEDULE

1:00 p.m.-2:30 p.m. **Plenary Session 6: Disparities in Response to Immunotherapy and the Cancer Immune Profile**
Continental Ballroom 5 & 6

Session Chair: Stefan Ambs, National Cancer Institute, Bethesda, MD

Race-related liver tumor subtypes are associated with gut microbiome-mediated metabolism
Xin W. Wang, National Cancer Institute, Bethesda, MD

Differences in the immune microenvironment of African American and Caucasian triple-negative breast cancer
Lajos Pusztai, Yale Cancer Center, New Haven, CT

Immunologic treatment of advanced prostate cancer: Preferential responsiveness in African-Americans
Oliver Sartor, Tulane Cancer Center, New Orleans, LA

2:30 p.m. **Closing Remarks**





UPCOMING CONFERENCES

Cancer Research UK-AACR Joint Conference: Engineering and Physical Sciences in Oncology

Conference Cochairs: Sangeeta N. Bhatia,
Kevin M. Brindle, Joe W. Gray, and Molly Stevens
October 15-17, 2019 | United Kingdom

AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics

Organizing Committee Cochairs: Elizabeth M. Jaffee,
James H. Doroshow, and Denis A. Lacombe
October 26-30, 2019 | Boston, MA

Tumor Immunology and Immunotherapy

Conference Cochairs: Timothy A. Chan,
Charles G. Drake, Marcela V. Maus,
and Arlene H. Sharpe
November 17-20, 2019 | Boston, MA

San Antonio Breast Cancer Symposium

Codirectors: Carlos L. Arteaga,
Virginia G. Kaklamani, and C. Kent Osborne
December 10-14, 2019 | San Antonio, TX

Advancing Precision Medicine Drug Development: Incorporation of Real World Data and Other Novel Strategies

Conference Cochairs: David M. Hyman,
Elaine R. Mardis, Lillian L. Siu,
and Eliezer M. Van Allen
January 9-12, 2020 | San Diego, CA

Sixth AACR-IASLC International Joint Conference: Lung Cancer

January 11-14, 2020 | San Diego, CA

Advances in Liquid Biopsies

Conference Cochairs: Luis A. Diaz Jr., Maximilian Diehn,
Irene M. Ghobrial, and Nicholas C. Turner
January 13-16, 2020 | Miami, FL

The Microbiome and Viruses

Conference Cochairs: Cynthia L. Sears, Giorgio Trinchieri,
Jennifer A. Wargo, and Laurence Zitvogel
February 21-24, 2020 | Orlando, FL

The Evolving Landscape of Cancer Modeling

Conference Cochairs: Cory Abate-Shen, Andrea Califano,
Jos Jonkers, and Calvin J. Kuo
March 2-5, 2020 | San Diego, CA

EACR-AACR Basic and Translational Research C onference: Tumor Microenvironment In partnership with ASPIC (Portuguese Association for Cancer Research)

Scientific Committee Cochairs: Carlos M. Caldas,
Luís Costa, and Lisa M. Coussens
March 2-4, 2020 | Lisbon, Portugal

Evolutionary Dynamics in Carcinogenesis and Response to Therapy

Conference Cochairs: James DeGregori,
Marco Gerlinger, Robert Gillies, and Andriy Marusyk
March 12-15, 2020 | Denver, CO

Advances in Prostate Cancer Research

Conference Cochairs: Felix Y. Feng,
Karen E. Knudsen, and Scott A. Tomlins
March 12-15, 2020 | Denver, CO

Please visit

[AACR.org/meetingcalendar](https://www.aacr.org/meetingcalendar)

for additional conferences and program updates.

INVITED ABSTRACTS

IA01 It doesn't have to be this way: What is public health doing to address health equity in cancer? [Lisa C. Richardson](#). Centers for Disease Control and Prevention, Atlanta, GA.

Public health is the science of protecting and improving the health of people and their communities. Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as a local neighborhood or as big as an entire country. The Centers for Disease Control and Prevention's (CDC's) main mission is to collect and analyze data to show where differences in outcomes occur and to design and implement programs to alleviate these differences. Dr. Richardson will present on the role of CDC's cancer control programs in identifying these differences and what they are doing address them. CDC works in collaboration with other governmental organizations and community leaders to lessen the cancer burden for everyone.

IA02 Science to policy for a ban on the sale of menthol and flavored tobacco products: The San Francisco Cancer Initiative (SF CAN). [Robert A. Hiatt](#). University of California San Francisco, San Francisco, CA.

The San Francisco Cancer Initiative (SF CAN) seeks to implement evidence-based interventions for the top five most prevalent cancers for which prevention and early detection procedures are available. In San Francisco, breast, prostate, colorectal, liver, and lung and other tobacco-caused cancers account for 48% of cancer mortality, and cancer is now the leading cause of death. SF CAN uses a "collective impact" structure whereby multiple health systems, the Department of Public Health, safety net clinics, nongovernmental agencies, and community groups all work together on the same goal of accelerating the reduction in cancer mortality at the population level, with the University of California San Francisco (UCSF) serving as the backbone entity. SF CAN has been active for 3 years and is supported by philanthropy, grants, and in-kind contributions from collaborative partners. Implementation work is carried out by five task forces, each made up of members from UCSF and collaborating institutions and agencies. The Tobacco Task Force, led by Dr. Stanton Glantz and his colleagues, has sought to have an impact on the use of menthol and flavored cigarettes on African Americans and other targeted ethnic groups, youth, and young adult tobacco use and tobacco cessation among homeless and substance-abusing populations within the city. Some of the interventions they are implementing, based on scientific evidence of impact, have had or will have direct policy implications. Foremost among these has been the use of evidence on the impact of menthol cigarettes, commonly used by African American,

Latino, and LGBT communities. The Task Force investigators assembled data on both the biologic mechanisms by which menthol additives increase the likelihood of addiction and the historical data from examination of documents obtained through legal channels from the tobacco industry. These data were first supplied to the FDA to assist in their decision-making and then made available to San Francisco Supervisors for their consideration for actions by local government ordinance. After consideration of the evidence and motivated by the health issues of their constituents, they wrote an ordinance completely banning the sale of all flavored tobacco products (including menthol). The ordinance passed unanimously in June 2017 and was signed into law by then-Mayor Lee. A petition drive to revoke the ordinance by referendum, heavily financed by RJ Reynolds Tobacco (maker of the leading menthol cigarette, Newport) with support from other tobacco companies, failed with 68% of voters in favor of keeping the ban. The ordinance went into effect in July 2018 with systematic outreach and education to retailers of tobacco by the SF DPH, and initial inspections were begun in Dec 2018 and have continued as routine since April of 2019 and found strong by tobacco outlets. This and other efforts at policy change in tobacco that have been conducted in the area of health economics of tobacco use and in the institution of smoke-free areas in homeless shelters around the city will be described.

IA05 Sexual orientation, race/ethnicity, and human papillomavirus vaccination disparities among young U.S. women: An intersectional approach. [Madina Agénor](#). Tufts University, Medford, MA.

Introduction: Human papillomavirus (HPV) vaccination, which is recommended for U.S. women and girls aged 11–26 years, effectively prevents cervical cancer. Researchers have identified HPV vaccination disparities among groups of women and girls defined in relation to sexual orientation identity or race/ethnicity. However, no study has used an intersectional approach to ascertain HPV vaccine uptake among sexual orientation identity and racial/ethnic subgroups of U.S. women and girls.

Methods: Using 2011–2015 National Survey of Family Growth data, we used multivariable logistic regression to estimate differences in the odds of HPV vaccination initiation (i.e., > one dose) across sexual orientation identity and racial/ethnic subgroups of black and white U.S. women aged 15–24 years (N = 2,413), adjusting for demographic factors. We also assessed whether socioeconomic and health care factors helped explain observed disparities.

Results: The overall prevalence of HPV vaccination initiation was 47.7%. Compared to white heterosexual women, black lesbians (odds ratio [OR] = 0.16; 95% confidence interval [95% CI]: 0.06, 0.46) had the lowest adjusted odds of HPV vaccination initiation, followed by white lesbians (OR = 0.33; 95% CI: 0.13, 0.82) and black heterosexual women (OR = 0.63; 0.47, 0.85). Including socioeconomic factors in the model only slightly attenuated the HPV vaccination initiation odds ratios for black lesbians (OR = 0.19; 95% CI: 0.06, 0.56), white lesbians (OR = 0.37; 95% CI: 0.15, 0.90), and black heterosexual women (OR = 0.70; 95% CI: 0.52, 0.93) compared to white heterosexual women. Adding health care factors only slightly additionally attenuated the odds ratio comparing black lesbians and white heterosexual women (OR = 0.21; 95% CI: 0.07, 0.67).

Conclusions: Our findings identified black lesbians as a particularly underserved subgroup and suggest that sexual orientation identity and race/ethnicity may have a compounding effect on HPV vaccination initiation among black and white U.S. women and girls. Evidence-based interventions that are adapted to the specific needs and experiences of black lesbians and other multiply marginalized groups are needed to promote equity in HPV-related outcomes.

IA06 What do we know about sexual minorities and cancer and where do we go from here? Ulrike Boehmer. Boston University, Boston, MA.

Lesbian, gay, bisexual, and individuals with same-sex partners are defined as sexual minority individuals and have been recognized as an underserved population. By reviewing key findings from population-based studies of sexual minority and heterosexual cancer survivors, we can determine characteristics of sexual minorities with cancer that are consistent across existing studies. Moreover, existing studies allow for the identification of potential mechanisms for consideration in interventions and to move towards development of tailored programs and interventions that improve sexual minority survivors' well-being. At the same time, it is important to describe gaps in knowledge about sexual minorities and cancer to direct future research needs to more fully understand sexual minority cancer survivorship.

IA07 Cancer survivorship among sexual minority people: Health, interventions, and next steps. Jennifer M. Jabson Tree. University of Tennessee, Knoxville, TN.

In the United States, approximately 1 million cancer survivors are sexual minority (cancer survivors who identify as gay, lesbian, bisexual) cancer survivors. The experience of cancer survivorship is not the same for all cancer survivors, and sexual minority cancer survivors experience barriers to health and positive outcomes as compared to heterosexual cancer survivors. Inequity in mortality risk, psychological distress, insurance denial, alcohol, tobacco, and substance use, poor self-rated health, and elevated stress and discrimination contribute to the risk for and prevalence of poorer outcomes after cancer treatment during the survivorship period for sexual minority cancer survivors. In an effort to improve health and reduce risk for poor outcomes after cancer, a few behavioral interventions have been introduced and tested for this unique group of cancer survivors. In this portion of the plenary I will discuss what is known about the existing behavioral interventions designed for sexual minority cancer survivors and their preliminary outcomes. The presentation of these interventions will be organized according to primary, secondary, and tertiary levels of prevention.

IA09 Border health overview: Challenges and opportunities. Amy Elizondo. National Rural Health Association, Washington, DC.

The rural areas of the United States-Mexico border are impacted by challenges that are uniquely different for health care providers and patients compared to those seen in urban areas. Rural populations, on average, have relatively more elderly, unemployment and underemployment, and poor, uninsured, and underinsured residents. They are more vulnerable to economic downturns because of their economic specialization than their urban counterparts. The US-Mexico border is one of the busiest in the world, spanning 2,000 miles between California to Texas, with roughly 30% of the estimated 30 million residing in rural areas of the border. In June of 2008, the National Rural Health Association (NRHA) convened the first meeting towards implementing an NRHA Border Health Initiative, a partnership for addressing the access needs of rural communities in this vast region of the country. Since the start of the initiative, partnerships between the NRHA and federal, state, and community-based organizations have been established to help address border specific issues through advocacy, communications, education, and research. This presentation will highlight the challenges and opportunities along rural areas of the US-Mexico border and discuss some of the outcomes of the

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NRHA's initiative that have developed over the last 11 years. Attendees can expect to 1) have a better understanding of specific health, population, and systemic issues occurring in this part of the country; 2) become familiar with some of the partners making an impact in this area; and 3) learn about recommendations for establishing progress.

IA10 Colorectal cancer mortality along the U.S.-Mexico border. [Caitlin C. Murphy](#). University of Texas Southwestern Medical Center, Dallas, TX.

Colorectal cancer (CRC) incidence and mortality have changed strikingly in the U.S. over the past three decades. Incidence and mortality rates have decreased among older adults since the early 1990s, largely due to improvements in average-risk screening. By contrast, incidence rates have rapidly increased in younger (age <50 years) adults, but little is known about the mechanisms contributing to young-onset CRC. These changes in incidence and mortality rates have not occurred equally by race/ethnicity or geography. To better understand the burden of CRC among Hispanics, we examined CRC mortality along the U.S.-Mexico border. We used data from the National Center for Health Statistics to estimate age-adjusted (to the 2000 U.S. standard population) mortality rates per 100,000 persons. We compared mortality rates between counties on the U.S.-Mexico border (41 counties in California, Arizona, New Mexico, and Texas) to non-border counties in the same states, overall and by ethnicity (Hispanic vs. non-Hispanic white) and age (+/- 50 years). From 1990 to 2016, there were 25,057 CRC deaths in counties along the U.S.-Mexico border and 1,453,410 deaths in non-border counties. Age-adjusted mortality rate was 21.1 per 100,000 and 25.9 per 100,000 in border and non-border counties, respectively (rate ratio [RR] 1.23; 95% CI 1.21, 1.24). Rates decreased over time in both border and non-border counties: from 26.9 per 100,000 to 17.8 per 100,000 in border counties and from 33.9 per 100,000 to 19.9 per 100,000 in non-border counties. There were differences in mortality by county and ethnicity in older adults (age ≥50 years). Specifically, the lowest overall mortality rate was among Hispanics living in border counties (43.1 per 100,000), and the highest was among whites in non-border counties (58.6 per 100,000). These differences disappeared over time, and in 2012-16, mortality rates across the four subgroups were similar (border: 42.3 per 100,000 non-Hispanic whites, 41.6 per 100,000 Hispanics; non-border: 44.8 per 100,000 non-Hispanic whites, 41.8 per 100,000 Hispanics). Mortality rates in younger adults increased from 1990 to 2016, and rates were slightly higher in non-border counties. For example, in 2012-16, age-adjusted mortality of young-onset

CRC was 2.6 per 100,000 in border counties compared to 2.9 per 100,000 in non-border counties (RR 1.11; 95% CI 1.00, 1.23). We observed lower CRC mortality rates in counties along the U.S.-Mexico border, particularly for older Hispanics. The mortality advantage in this subgroup declined over time, driven by improvements in non-border counties and among non-Hispanic whites. Rates remained stable among Hispanics in border and non-border counties. Younger adults experienced CRC-related mortality, regardless of county or ethnicity. These findings may reflect generational or birth cohort differences in cancer risk.

IA11 Cancer disparities and survivorship challenges facing young Latina women (<50 years) on the U.S.-Mexico border. [Rebecca Palacios](#). New Mexico State University, Las Cruces, NM.

Disparities in the incidence of specific cancers are prevalent among young Latinas (i.e., < 50 years). Although research focusing exclusively on Latina cancer survivors is limited, mixed-sample research suggests that Latina cancer survivors experience greater distress relative to non-Latina white (NLW) survivors, predisposing them toward poorer cancer outcomes. Young Latina survivors who are parenting school-age children may be at even higher risk of poor cancer survivorship, given research demonstrating that young NLW women experience worse physical and psychological well-being and greater illness intrusiveness compared to older NLW women (i.e., >50 years). This presentation describes the cancer disparities and survivorship challenges encountered by young Latina women living along the Paso del Norte U.S.-Mexico border region.

Methodology: Cancer registries were used to identify cancer disparities in the U.S.-Mexico border counties. Elicitation and focus group interviews conducted with diagnosed child-rearing Latina mothers explored their challenges in coping with cancer while parenting school-age children. Findings from the qualitative research informed the cultural adaptation of an evidence-based program, Enhancing Connections, to help Latina cancer survivors and their children cope with cancer. A subsequent study examined the feasibility and short-term efficacy of the culturally adapted Conexiones program.

Results: Based on research conducted exclusively with Latina women along the U.S.-Mexico border, this presentation will demonstrate (1) how cancer disparities worsen as the focus shifts from the national level to the U.S.-Mexico border region, (2) the challenges in cancer survivorship along the Paso del Norte U.S.-Mexico border region, and (3) research

efforts designed to improve the quality of survivorship among young Hispanic mothers diagnosed with cancer.

IA12 Border Health Consortium of the Californias. Prisci Quijada. California Department of Public Health, San Diego, CA.

San Diego County is a minority-majority region, in which non-Hispanic whites are not the majority population (46%). Hispanics comprise 33.5% of the population and Asian Pacific Islanders (APIs) make up 12.8%. For risk factor burden, data based on California Health Interview Survey and Behavioral Risk Factor Surveillance System show that Hispanics in San Diego County have the lowest colorectal, breast, and cervix cancer screening rates, the highest obesity prevalence, and the highest proportion of no physical activity. The mission of the Border Health Consortium of the Californias-Binational Cancer Work Group is to promote cancer-free lives and erase borders in our region. We will identify and characterize priority cancer topics for our border region, organize along the cancer control continuum, identify key border region cancer activities and resources (binational), and identify key border region cancer needs (binational). To reach our objectives we will optimize collaboration, coordination, and cooperation.

IA13 Introduction of HPV self-collection in Argentina, main results, and lessons. Silvina Arrossi. CEDES, Buenos Aires, Argentina.

Background: Control of cervical cancer in developing countries has been hampered by a failure to achieve high screening uptake. HPV self-collection could increase screening coverage, but implementation of this technology is difficult in countries with low-income settings. In Argentina, during 2012-2014 we implemented the Jujuy Demonstration (JDP) to introduce HPV testing as primary screening. As part of the JDP, we investigated whether offering HPV self-collection during routine home visits by community health workers could increase cervical screening.

Methods: We describe the programmatic components developed for each phase of HPV self-collection implementation as well as present data about its performance to detect CIN2+ lesions. For that we analyzed data from the national screening information system (SITAM); we reviewed program documents, presentations, and reports; and we also analyzed qualitative/quantitative data about HPV self-collection acceptability by women and health providers.

Results: Acceptability and effectiveness of HPV self-collection to increase screening-uptake was evaluated in

a research project (The EMA Project) carried out in 2012 in the province of Jujuy. The project combined qualitative research with a Cluster Randomized Trial. 200 community health workers were randomly allocated in a 1:1 ratio to either the intervention group (offered women the chance to self-collect a sample for cervical screening during a home visit) or the control group (advised women to attend a health clinic for cervical screening). Results showed that HPV-self collection was accepted by women and health providers, and effective to increase screening uptake (risk ratio 4.02, 95% CI 3.44–4.71). HPV-testing CIN2+ detection rate was 1.15%. Results from the EMA Project were used to design and develop key components of the scaling-up phase (training and communication materials, protocols, and guidelines). In 2014 HPV self-collection was extended to the whole province as a strategy to increase screening among socially vulnerable women. It was offered by 70% of the 700 provincial community health workers. Facilitators of self-collection scaling-up were the organizational capacity of the provincial health system, sustainable funding for HPV testing, and local consensus about the value of the technology. In 2014, self-collection represented 38% of total HPV testing and, if we consider the whole JDP, 10% of screening in the target population was achieved through self-collection. CIN2+ detection rate of HPV self-collection when used as a programmatic strategy was 0.6%; this decrease in relation to the detection rate found in the EMA Project is probably explained by a loss to follow-up.

Conclusion: HPV self-collection was successfully scaled up, with a high level of adoption among health providers, which resulted in increased screening among socially vulnerable underscreened women.

IA15 Breast cancer screening opportunities in sub-Saharan Africa. Alice Chong. RAD-AID International, Chevy Chase, MD.

Breast cancer, the most common cancer in women worldwide, is largely curable in high-income countries when detected early. In the low- and middle-income countries (LMICs), including those in sub-Saharan Africa, breast cancer usually presents as a late-stage disease that is associated with high mortality rates. Using specific country examples, the presentation covers tailored strategies for breast cancer screening and early detection in low-resource settings, which should be undertaken only after diagnostic and treatment infrastructure is assured.

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IA17 Observations and implications from examining cancer incidence rates and trends of ethnic Asian Americans. [Lihua Liu](#), Juanjuan Zhang, Andrea Sipin-Baliwas, Amie Hwang, Mariana C. Stern, Myles Cockburn, Dennis Deapen. University of Southern California, Los Angeles, CA.

Asian Americans are a fast-growing population group in the United States (US). The substantial heterogeneity within them (e.g., by origin, language, culture, immigration history, socioeconomic status, degree of acculturation, etc.) and its impact on health and cancer disparities are increasingly being recognized. Except for Japanese Americans, the majority of the ethnic Asian Americans are foreign-born. Monitoring cancer incidence rates and trends among immigrant populations, especially in comparison with those of their countries of origin and US, can provide valuable information for understanding cancer etiology and identifying modifiable environmental and behavioral risk factors. As population mobility increases globally with time, this area of research will become more important and needed. The Los Angeles Cancer Surveillance Program (LACSP) is the population-based cancer registry for Los Angeles County (LAC) in California with over 10 million residents. It is a member of the California Cancer Registry (CCR) and the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program. It is also the only U.S. cancer registry that has consistently reported cancer incidence for four ethnic Asian American populations (i.e., Chinese, Filipinos, Japanese, and Koreans) in its catchment area, which allows the comparisons of these largely immigrant populations against those of their countries of origin and US whites. The standardized and detailed data from LACSP and around the world published in the Cancer in Five Continents (CI5) volumes have enabled numerous international comparison studies. We used the CI5 online analysis tool, CI5plus, and extracted age-adjusted incidence rates by sex and cancer site in LAC for Chinese, Filipinos, Japanese, and Koreans, respectively, to compare with rates from China, Philippines, Japan, and South Korea, as well as those for whites from the SEER registries for the period of 1973-2012. We observed: 1) Cancer-specific incidence rates among all four Asian ethnic groups in LAC have deviated from the rates in their countries of origin to approaching US whites; 2) although their risks for some cancers decreased (e.g., cervical, gastric, and liver), their risks for other cancers increased (e.g., breast, uterine, non-Hodgkin lymphoma, and testicular); and 3) Filipino Americans display rather different cancer risk profiles from other ethnic Asian Americans. Our findings highlight the important changes in cancer-specific incidence rates and trends among the ethnic Asian American subgroups as compared to those of their countries of origin. These changes

underline the significance of nongenetic factors, including environmental, behavioral, and lifestyle factors, in cancer development and deserve further attention. Along with existing literature on known differences in cancer risk among these subpopulations, our work will help establish priorities to decrease cancer burden among Asian immigrants.

IA18 The unnecessary epidemic: Skin cancer in Hispanics and what we need to do about it. [Myles Cockburn](#), Jennifer Unger, Kimberly Miller. USC/Keck School of Medicine, Los Angeles, CA.

Melanoma is a highly complex disease with multifaceted etiology, whose incidence is on the rise, over and above the impact of screening. Hispanics represent an underserved and understudied population when it comes to melanoma occurrence and outcome. Hispanics are diagnosed with melanoma at later stages than their non-Hispanic white (NHW) counterparts, leading to increased likelihood of metastasis and worse survival. Hispanics are the largest ethnic group in the United States and have rising rates of melanoma, and in particular, increases in tumors with the worst prognosis. While histologic type of melanoma varies by ethnicity (Hispanics tend to get more acral lentiginous melanomas, which tend to present at a later stage), histology does not explain the poorer experience of Hispanics: they are diagnosed with later-stage disease regardless of histology. In our recent analysis, while the risk of presenting with a late-stage melanoma was higher for Hispanics (OR:1.65 [95% CI:1.52-1.79]) than NHW, the overall risk of death from melanoma after accounting for stage at diagnosis was similar for Hispanics and NHW (HR: 0.99 [95% CI: 0.94-1.04]), implying that the overall poorer prognosis for Hispanics is due almost entirely to their later stage of disease at diagnosis, rather than response to treatment or other factors (e.g., ability to access treatment) once they are diagnosed. However, the key question remaining to be answered is *why* Hispanics are diagnosed at a later stage: without answering that question, we cannot begin to design, test, and implement effective interventions to reduce the melanoma burden in Hispanics. A later stage of diagnosis among Hispanics (compared to NHWs) could be due to a multitude of factors, all of which are modifiable: a lack of access to appropriate screening, lack of adherence to screening recommendations, lack of understanding of appropriate screening approaches in the primary care setting (among both patients and physicians), or a combination of these factors. Addressing the epidemic of melanoma among Hispanics is not limited to investigation of factors resulting in delayed diagnosis: we also lack an understanding

of the primary drivers of Hispanics' lower overall incidence of melanoma (roughly 7 times lower than non-Hispanic whites). Melanoma risk factors either have similar frequency in Hispanics and NHWs (e.g., many large nevi) or are less frequent in Hispanics but do not explain a high proportion of disease variation (e.g., red hair). Considering current knowledge of risk factor prevalence, melanoma incidence rates should actually be similar in Hispanics and non-Hispanic whites. Understanding the factors leading to the lower overall rate of melanoma in Hispanics could help inform prevention strategies for non-Hispanic whites—or determine new genetic pathways as yet undiscovered. While it is possible that Hispanics' rates of melanoma are lower because they practice better sun-exposure behaviors, we have recently shown that Hispanic children, while frequently engaging in some sun-protective behaviors, also had a high rate of sunburn (59%). U.S.-acculturated Hispanic children reported less shade-seeking at school ($P = .001$). The surprisingly high rate of sunburn in Hispanic children suggests that the way in which they are practicing sun protection is not preventing sunburns and is an alarming early warning sign for future increases in melanoma rates among Hispanics. Sun safety interventions should be targeted toward Hispanic youth to provide them with practical methods of effective sun protection, in addition to education on the risks of high sun exposure. The contrast in melanoma experience between Hispanics and NHW implies that we already know how to reduce the occurrence of late-stage melanoma in Hispanics, and a better understanding of the differing rates of melanoma among Hispanics and NHW might actually provide insight into enhanced melanoma primary prevention in both groups.

IA21 Social factors and prostate cancer disparities in

African American men. [Scarlett Lin Gomez](#)¹, Iona Cheng¹, Salma Shariff-Marco¹, Mindy C. DeRouen¹, Ann S. Hamilton², Daphne Y. Lichtensztajn¹, Pushkar Inamdar¹, Debby Oh¹, Laura Allen¹, Kirsten Beyer³, Yuhong Zhou³, Joseph Gibbons⁴, Richard Pinder², David J. Press⁵, David Conti², Christopher Haiman². ¹Helen Diller Family Comprehensive Cancer Center, University of California San Francisco, San Francisco, CA, ²Keck School of Medicine, University of Southern California, Los Angeles, CA, ³Medical College of Wisconsin, Wauwatosa, WI, ⁴San Diego State University, San Diego, CA, ⁵University of Chicago, Chicago, IL.

African-American (AA) men experience the highest prostate cancer (PCa) incidence and mortality rates of all U.S. racial/ethnic groups. They are also known to present with more aggressive high-risk disease, especially of higher Gleason score and PSA levels. Factors contributing to the high burden of PCa among AA men are not known. AAs are exposed

to considerably higher levels of social stressors such as institutional and interpersonal discrimination, early life adversity, crime, low socioeconomic status, social isolation, and resource-poor environments. These social stressors exist at multiple levels, from individual to neighborhood to institutional, and across the lifecourse, leading to chronic stress. These social stressors experienced among AA men may thus be a contributor to the development of aggressive PCa and high mortality. This presentation will explore the conceptual multilevel frameworks that emphasize the consideration and evaluation of exposures from “cells to society” to understand how “stress gets under the skin” to cause biologic vulnerability, specifically the high burden of PCa among AA men. Within the infrastructure of the new RESPOND (Research on Prostate Cancer in Men of African Ancestry: Defining the Roles of Genetics, Immunity and Social Stress) Study, a nationwide cohort of 10,000 AA men with incident PCa, our project aims to: 1) Examine the associations between exposures to neighborhood social stressors and risk of aggressive PCa and mortality among AA and non-Hispanic White (NHW) men. Among population-based samples of all AA (N=149,000) and NHW (N=668,000) men diagnosed with PCa in the RESPOND catchment areas, we will link geospatial neighborhood data on segregation, racial composition, socioeconomic deprivation, and other social and built environment attributes to cancer registry data and examine the associations between these neighborhood factors and aggressive PCa and risk of mortality. 2) Examine the associations between exposures to multilevel social stressors across the lifecourse and risk of aggressive PCa among 10,000 AA men in RESPOND. 3) Examine the associations between exposures to multilevel social stressors across the lifecourse and genetic factors, as well as their combined effects in association with aggressive PCa. Covering 6 states and 1 metropolitan region and representing 38% of all AA men with PCa in the US, RESPOND will represent the single largest coordinated research effort to study aggressive PCa in AA men, with an innovative focus on social stressor exposures that are most relevant to this population. This project has the potential of identifying modifiable risk factors for aggressive prostate cancer to inform targeted prevention on a broad public health scale, such as targeting community support resources to neighborhoods with high stressors; the lifecourse approach will also provide the opportunity to identify critical time windows of disease susceptibility. The short-term impact of this research will be our expanded understanding of contextual- and individual-level stressors that are associated with aggressive disease among African American men, and the long-term impact, with future follow-up, is the determination of the effect of these social factors on disease progression and mortality.

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IA22 A comprehensive and integrated approach to identify factors associated with aggressive prostate cancer in African-Americans: The RESPOND Study.

Ann S. Hamilton¹, Scarlett Gomez², Xiao-Cheng Wu³, Kevin Ward⁴, Melissa Bondy⁵, Rosemary Cress⁶, Jennifer Beebe-Dimmer⁷, Karen Pawlish⁸, Jong Park⁹, Iona Cheng², Antoinette Stroup¹⁰, Thomas Sellers⁹, Susan Gundell¹, Angelo Demarzo¹¹, Denise Modjeski¹, Stephen Chanock¹², Salma Shariff-Marco², Mindy DeRouen², John Carpten¹, Franklin Huang², Karen Sfanos¹¹, Tamara Lotan¹¹, David Conti¹, Christopher Haiman¹. ¹University of Southern California, Los Angeles, CA, ²University of California San Francisco, San Francisco, CA, ³Louisiana State University Health Center, New Orleans, LA, ⁴Emory University, Atlanta, GA, ⁵Baylor College of Medicine, Houston, TX, ⁶Public Health Institute, Davis, CA, ⁷Wayne State University, Detroit, MI, ⁸New Jersey Department of Health, Trenton, NJ, ⁹Moffitt Cancer Center, Tampa, FL, ¹⁰Rutgers University, New Brunswick, NJ, ¹¹Johns Hopkins University, Baltimore, MD, ¹²NCI, Bethesda, MD.

African American (AA) men have a >60% higher incidence, are more likely to be diagnosed with aggressive and potentially lethal PCa, and are more than twice as likely to die from PCa than white (WH) men. Reasons for the greater burden of aggressive disease in AA men are unknown but are likely to include a multitude of factors including social factors such as lifetime stress, inherited susceptibility, and tumor-related features such as somatic alterations and local inflammation in the microenvironment. RESPOND (Research on Prostate Cancer in Men of African Ancestry: Defining the Roles of Genetics, Immunity and Social Stress) has been funded to study the reasons for increased risk of aggressive disease among AA and will include a comprehensive approach including the role of stress and the contextual environment (Project 1), germline susceptibility (Project 2), tumor somatic genetics (Project 3), inflammatory tumor microenvironment (Project 4), and, the integrated synergistic effects of these factors. Project 1: Social stress: AA men are uniquely exposed to high levels of social adversity such as discrimination, violence, crime, financial strain, and residence in poor-resourced environments, over their lifetime. These social stressors are experienced at multiple levels, including individual, neighborhood, and institutional, ultimately leading to chronic and long-term stress. Social stressors may be a contributor to the development of aggressive PCa and high mortality. Project 2: Germline genetic factors: There is evidence to suggest genetic differences in the allelic architecture of PCa across populations. We found a region of the genome (8q24) that harbored genetic risk alleles that may contribute to the greater risk of PCa in AA men. Substantially larger collections of AA cases are needed to

reveal a common susceptibility locus that is specific to high-risk disease. We will be expanding genome-wide efforts to identify susceptibility alleles for aggressive PCa in AA men. Project 3: Somatic genetic factors. PCa is a heterogeneous and multifocal disease with a diverse genetic component. Few genetic or molecular drivers of aggressive disease have been identified, and studies in AA men are critically limited. This is due to the fact that the majority of PCa profiling studies have focused on localized disease and largely on men of European ancestry. We will address this issue through the comprehensive and integrated genomic and transcriptomic analysis of a large number of clinically annotated aggressive vs. nonaggressive PCas in AA men. We anticipate that this study will identify genomic markers of aggressive PCa in general and AA PCa in particular, with some of these somatic events being therapeutically actionable, leading to new treatment paradigms for this lethal disease. Project 4: Inflammatory tumor microenvironment. There is evidence to suggest that inflammation drives the formation of precursor lesions to PCa development and may contribute to PCa progression. The consistent observation of overexpression of genes involved in inflammatory pathways in PCa tumors from AA men points to a proinflammatory immune cell component in the tumors of these men that may contribute to PCa progression and their higher PCa mortality. Integration of social and genetic information: Independently evaluating germline, somatic genome, and tumor microenvironment characteristics of PCa ignores the potential for shared biologic mechanism(s). The integration of data across these domains will lead to the identification of shared genes and/or pathways that define more homogeneous, and clinically important, subsets of PCa tumors. The vast genomic and molecular data generated in the same individuals will facilitate the estimation of tumor subgroups as a function of somatic and tumor microenvironment and an assessment of their relationship with other potential PCa risk factors, such as socioeconomic factors, lifetime stress, and genomic germline variation. We will evaluate the association of integrated molecular profiles with recurrence and survival in the future. The RESPOND Cohort: We are in the process of recruiting a cohort of 10,000 incident AA PCa cases to support the four research projects. The men, diagnosed between 2015-2018, are being recruited through cancer registries in 7 states (California, Florida, Georgia, Louisiana, Michigan, New Jersey, and Texas). The fieldwork procedures include enrolling the men by completion of a mailed (or online) survey, followed by a request to obtain a saliva sample and HIPAA authorization to obtain tumor tissue. Of the ~23,000 AA PCa patients we will contact, we estimate to receive a survey from 45% (10,050), DNA from 33% (7,543), HIPAA release from 26% (6,030) and tumor samples

for 13% (3,015). Impact: In Project 1, we are studying the impact of multilevel stressors over the lifecourse on risk of developing aggressive and lethal PCa, providing both a means of identifying high-risk men for targeted prevention and treatment, as well as informing the etiology by which tumor aggressiveness arises. In Project 2, the ability to better understand, based on inherited variation, which AA men are at greater risk of developing aggressive and lethal PCa will help in the development of targeted screening and prevention strategies. In Project 3, delineating the genomic events that are acquired during the development of PCa in AA men may guide the development of targeted therapeutic strategies for men whose tumors display aggressive molecular signatures. In Project 4, the ability to define immune profiles associated with aggressive PCa in AA men could inform the development of cancer prevention and/or treatment strategies. Altogether, this body of research will provide impactful information as to the underlying factors that contribute to aggressive PCa in AA men.

IA23 Housing discrimination and cancer disparities research: How are key decisions made? [Kirsten M. M. Beyer](#). Medical College of Wisconsin, Milwaukee, WI.

Housing discrimination, including residential racial segregation, is of growing interest as an upstream influence on cancer disparities. However, there are a number of measures available at various spatial scales, and decisions must be made along the way when choosing how to include these constructs in empirical research. In this presentation, we will discuss how these decisions are made, including: (1) how do you choose a measure of housing discrimination? (2) how do you choose a spatial scale (e.g., metropolitan area, tract, ZIP code)? (3) how do you select a study design? (4) where do you get the data? (5) how might these choices be informed by a conceptual model? and (6) how do you interpret findings? We will draw upon the Breast Cancer, Race and Place study, based in Milwaukee, Wisconsin, to illustrate these decisions and share recent findings from this ongoing project.

IA25 Using cancer registry data for geospatial and disparity research. [Recinda Sherman](#). North American Association of Central Cancer Registries (NAACCR).

This talk will provide an overview on how to use cancer registry data in geospatial analysis. Our national cancer surveillance system comprises a set of international data collection standards overseen by individual state registries. While there are highly detailed geospatial data available

from each state registry, not all registries release these data and each have separate data release procedures, regulations, and cost. This presentation will discuss how the cancer surveillance community geocodes cancer incidence data and creates geocoded data quality measures. This presentation will also detail the current area-based social measures available to researchers in the national CiNA (Cancer in North America) cancer incidence dataset. Release procedures and limitations of the data will be described, and the move towards a national geographic dataset for cancer incidence data will be presented.

IA26 Breast tumor microenvironment in black women: A distinct signature of CD8+ T-cell exhaustion. [Song Yao](#)¹, Ting-Yuan Cheng², Ahmed Elkhanany¹, Li Yan¹, Angela Omilian¹, Scott I. Abrams¹, Sharon Evans¹, Chi-Chen Hong¹, Qianya Qi¹, Warren Davis¹, Song Liu¹, Elisa V. Bandera³, Kunle Odunsi³, Kazuaki Takabe¹, Thayer Khoury¹, Christine B. Ambrosone¹. ¹Roswell Park Comprehensive Cancer Center, Buffalo, NY, ²University of Florida, Gainesville, FL, ³Rutgers Cancer Institute of New Jersey, New Brunswick, NJ.

Background: Blacks tend to have a stronger inflammatory immune response than Whites. We hypothesized that racial differences in host immunity also manifest in the tumor microenvironment (TME), constituting part of a distinct tumor biology underlying more aggressive breast cancer and higher mortality in Black women.

Patients and Methods: Pathologic and gene expression profiling approaches were used for comprehensively characterizing infiltrating immune cells in breast TME from 1,315 patients from the Women's Circle of Health Study (WCHS). Racial differences in tumor immune phenotypes were compared, with results validated in data from The Cancer Genome Atlas (TCGA). Prognostic associations of immune phenotypes were assessed in WCHS, TCGA and Molecular Taxonomy of Breast Cancer International Consortium (METABRIC) cohorts.

Results: We found marked and consistent differences in tumor immune responses between Black and White patients. Not only did tumors from Blacks display a stronger overall immune presence, but the composition and quality of immune infiltrates differed, independent of tumor subtypes. Black patients had a stronger humoral immunity response, and further, a more exhausted CD8+ T-cell profile featuring the coexpression of PD-1, LAG3, and CTLA4. A signature indicating a higher ratio of exhausted CD8+ T cells to total CD8+ T cells (ExCD8-r) was consistently associated with poorer survival, particularly among hormone receptor-

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positive patients. Combinations of the absolute fraction of CD8+ T cells and ExCD8-r signature identified the CD8-low/ExCD8-r-high subgroup, the most prevalent among Blacks, as having the worst survival.

Conclusions: Our findings of a distinct exhausted CD8+ T-cell signature in Black breast cancer patients indicates an immunobiologic basis for their more aggressive disease, and also a rationale for the use of immune checkpoint inhibitors targeting the exhaustion phenotype.

IA27 Metformin use and pancreatic cancer survival: Are there racial differences? Kenneth R. Carson, [Adetunji T. Toriola](#), Suhong Luo, Theodore Thomas, Bettina F. Drake, Su-Hsin Chang, Kristen M. Sanfilippo. Washington University School of Medicine, St. Louis, MO.

Background: The effect of metformin use on survival among pancreatic ductal adenocarcinoma (PDAC) patients is controversial. Further, there are no data on African American patients. To address these, we analyzed data from the United States Veterans Health Administration (VHA).

Methods: We performed a population-based retrospective cohort study evaluating survival among 3,811 PDAC patients with pre-existing diabetes mellitus (DM), diagnosed with PDAC within the VHA between 1998 and 2013. We calculated hazard ratios (HRs) and 95% confidence intervals (CIs) using multivariable adjusted conventional Cox proportional hazards regression as well as the time-varying Cox proportional hazards regression to control for immortal time bias and confounders. All statistical tests were two-sided.

Results: In multivariable adjusted analyses using the conventional Cox model, there was an artificial survival benefit associated with metformin use: HR= 0.89 (95%CI 0.83-0.98, p-value=0.01). In multivariable adjusted analyses using the time-varying Cox model, metformin use was not associated with survival: HR=1.05 (95%CI 0.92-1.14, p-value=0.28). Results were similar among non-Hispanic white patients: HR=1.05 (95%CI 0.96-1.14, p-value=0.26) and African American patients: HR=1.01 (95%CI 0.86-1.19, p-value=0.88). Among patients who were metformin naïve at the time of PDAC diagnosis (N=1158), metformin use was associated with improved survival in non-Hispanic white: HR=0.78 (95%CI 0.61-0.99, p-value=0.04), but not African American patients: HR=1.20 (95%CI 0.75-1.93, p-value=0.45). The survival benefit among non-Hispanic whites was limited to patients with metastatic disease: HR=0.67 (95%CI 0.44-1.01, p-value=0.055). Among African American patients with metastatic disease, HR was 1.30 (95%CI 0.77-2.53, p-value=0.28). There was an interaction between race

and metformin use in patients with metastatic disease (p-interaction=0.05).

Conclusions: Although metformin use was not associated with survival in patients with PDAC, the survival benefit limited to non-Hispanic white patients who were metformin naïve at the time of diagnosis deserves further study in a racially diverse study population.

IA28 Disparities in cardiovascular disease incidence in breast cancer survivors. [Zaixing Shi](#)¹, Heather Greenlee¹, Romain S. Neugebauer², Carlos Iribarren², Mai N. Nguyen-huynh², Jamal S. Rana², Dawn L. Hershman³, Lawrence H. Kushi², Marilyn L. Kwan². ¹Fred Hutchinson Cancer Research Center, Seattle, WA, USA, ²Kaiser Permanente, Oakland, CA, ³Herbert Irving Comprehensive Cancer Center, New York, NY.

Many breast cancer therapies have adverse effects on the cardiovascular health of patients. Breast cancer patients who are members of racial/ethnic minority and disadvantaged socioeconomic groups suffer disproportionately from cardiotoxicity during and after cancer treatment, leading to disparities in overall survival. These disparities may exist, in part, because of inequality in the management of pre-existing cardiovascular diseases and its risk factors such as hypertension and diabetes. Shared lifestyle risk factors for breast cancer and cardiovascular diseases, including obesity, poorer diet, and lack of physical activity may contribute to disparate outcomes in cardiotoxicity. In addition, patients of racial/ethnic minority and disadvantaged socioeconomic groups may have limited access to cardio-oncology care due to lack of insurance coverage and longer geographic distance from their health care provider. Patients living in disadvantaged neighborhoods may lack healthy food options and exercise facilities, thus are unable to follow a healthier lifestyle. We present evidence from prior studies on these potential mechanisms of disparities in cardiotoxicity and accompanying gaps in research. Finally, we introduce our ongoing Pathways Heart Study (R01 CA214057, mPI: Kwan, Greenlee), a large population-based study of nearly 15,000 breast cancer survivors and 75,000 noncancer controls who are members of Kaiser Permanente Northern California, which is an extension of the Pathways Study of 4,505 breast cancer survivors (U01 CA195565, mPI: Kushi, Ambrosone). Our study provides a unique opportunity to better understand the individual and health care system level contributors to risk of cardiotoxic outcomes.

IA30 Population-level problems require system level solutions: Using collective impact approaches to solving cancer disparities. [Kim F. Rhoads](#). UCSF Helen Diller Family Comprehensive Cancer Center, San Francisco, CA.

Disparities in cancer incidence and mortality are longstanding and tenacious. The disproportionate burden of disease is borne by racial/ethnic minority groups, as well as those living in economically depressed conditions, regardless of race/ethnicity. Although there is no physiologic or genetic link between some of these disparate populations, the similarities in the experience of cancer outcomes suggests that they may be driven by socioeconomic conditions and inequities that underpin the US health care system. Despite the multilevel nature of the drivers of disparate outcomes, public health facing solutions have largely focused on interventions aiming to change individual level health behaviors, such as risk reduction, increasing screening, and early detection. Historically, much less attention and intervention have been directed toward addressing systemic factors, either inside or outside of the health care system, that contribute. Accordingly, gaps in cancer survival have persisted over time, and in some cases those gaps have widened. More recent discourse on cancer and other health disparities has emphasized the importance of the Social Determinants of Health (SDOH); in doing so have made clear the necessity for a multilevel, multisectoral approach to eliminate these differences. “Collective impact” is one such approach. Collective impact is defined as the commitment of a group of key actors from different sectors to a common agenda for solving a specific social problem. The five conditions of a collective impact approaches include a common agenda, shared measurement systems, mutually reinforcing activities; continuous communication, and backbone support organizations. This presentation will review some successes and lessons learned from well-established collective impact activities addressing noncancer conditions at our institution. We will then explore the establishment of a collective impact approach to addressing the burden of cancer in San Francisco and other surrounding counties. We will emphasize early successes in both big “P” as well as small “p” policy realms and highlight the role of the Comprehensive Cancer Centers in supporting system-level solutions to this longstanding population-level challenge.

IA31 Collaboration to address cancer health disparities among Asian Americans and Latinos in Orange County, CA. [Sora P. Tanjasiri](#), Cevadne Lee. University of California, Irvine, Irvine, CA.

Introduction: Orange County (OC) is the third most populated county in California, and the primary catchment area for the University of California, Irvine’s Chao Family Comprehensive Cancer Center (CFCCC). With nearly 3.2 million residents over a urban/suburban geographic area of nearly 950 square miles, the county is home to the second-largest population of Latinos (nearly 1.1 million) in California, and the largest population of Vietnamese (over 170,000) in the US. While breast, lung and colorectal cancers are the top overall causes of cancer incidence and mortality in OC, respectively, our catchment area also includes unique cancers among Latinos (e.g., liver), Asian Pacific Islanders (e.g., liver and stomach), and Whites (e.g., skin/melanoma).

Methods: Since launching CFCCC’s Office of Community Outreach and Engagement in August 2018, our staff has undertaken an exhaustive needs assessment and focused our educational activities on strengthening the infrastructure of community partners to meet the prevalent and unique cancer needs of our communities. Based upon the definition that community engagement “...refers to values, strategies, and actions that support authentic partnerships, including mutual respect ..., power sharing and equity; mutual benefit... and flexibility in pursuing goals, methods and time frames to fit the ... capacities of communities” (Jones et al., 2007), we have intentionally pursued collaborations that allow CFCCC to enhance rather than compete with community organizations and health systems.

Results: Data from n=18 key informant interviews and the California Cancer Registry found that the top catchment area priorities to be increasing cancer screening rates, reducing cultural cancer stigmas, and collaborations that facilitate access to cancer care for low-income populations. CFCCC collaborated on the launch of three large-scale capacity-building cancer education collaborations for skin screening targeting the overall OC population; for Vietnamese Hepatitis B screening and prevention; and for breast, cervical, colorectal, and liver cancer screenings among Latinos and Asian Americans.

Conclusions: These efforts demonstrate the power of community engagement to rapidly catalyze and create unique community-based efforts that strengthen capacities and infrastructures and promote best practices in cancer prevention and early detection designed to decrease cancer incidence and/or mortality in the communities we serve. Future plans include understanding and addressing unique

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cancer prevention (e.g., tobacco), best practices to achieving cancer health equity, and co-survivor needs.

IA33 Precision medicine at Weill Cornell Medicine/New York Presbyterian: Breaking silos, integrating resources, being inclusive. [Andrea Sboner](#), Cora Sternberg, Juan Miguel Mosquera, Wei Song, Michael Kluk, Wayne Tam, Hanna Rennert, David Pisapia, Jeffrey Catalano, Gloria Cheang, David Wilkes, Danielle Bulaon, M. Laura Martin, Alexandros Sigaras, Kenneth Eng, Rohan Bareja, Rob Kim, Massimo Loda, Olivier Elemento. Weill Cornell Medicine, New York, NY.

Genomic testing with next-generation sequencing (NGS) has become a pillar of precision medicine, whose aim is to identify the genomic alterations of a patient's tumor and provide guidelines to clinicians for optimal treatment. Clinical testing is typically performed with targeted panels interrogating a limited set of genes, selected based on our best scientific knowledge on their diagnostic or prognostic role. Despite more recent efforts to be more inclusive, most genomic databases have a limited representation of non-European populations, resulting in a biased selection of those genes, and the potential exclusion of under-represented groups from the benefit of precision medicine. At the Englander Institute for Precision Medicine (EIPM), we developed a whole-exome sequencing (WES) clinical test, EXaCT-1, which interrogates about 21,000 protein coding genes for single-nucleotide variants, indels, and copy number. EXaCT-1 enables an unbiased view of the genomic landscape of a patient's tumor and allows for the collection of data to investigate genomic diversity. We also tackled one of the major barriers of precision medicine: the infrastructure to execute clinical sequencing. From ordering a test, collecting and processing samples, to the analysis and review of the data and generation of reports, several systems, procedures, and expertise are involved, and their effective coordination is a key component for the timely delivery of results. We have built a framework supporting the entire process of clinical genomic testing: a Laboratory Information Management System (LIMS) helps the clinical lab to receive orders, acquire and process specimens, and seamlessly communicate with the sequencers and the computational pipelines. Molecular pathologists use NGSReporter, a secure web application, to review the data and sign-out reports. NGSReporter integrates the results of a test with our Precision Medicine Knowledge Base (PMKB – <https://pmkb.weill.cornell.edu>), which classifies variants based on their relevance to clinical management and provides standardized interpretations. Reports are sent to the electronic health record (EHR) as PDFs as well as discrete entities, enabling queries such as: “Which Hispanic patients with KRAS mutations are diabetic?” Sharing

de-identified data is also a key aspect of precision medicine. To this end, we provide our investigators and collaborators with a protected cBioPortal instance that, in addition to publicly available datasets, includes internal data, thus enabling the exploration of hypotheses about the role of alterations across different cohorts and clinical features. Being in the center of New York City has the added benefit of an ethnically diverse patient population. Finding the “right treatment for the right person and at the right time” requires a concerted effort of multiple partners. The EIPM infrastructure facilitates these efforts, with the goal of making precision medicine accessible to everyone.

IA34 The impact of ancestry on mutational signatures in population with African ancestry. [Paz Polak](#). Icahn School of Medicine, Mount Sinai Hospital, New York, NY.

Mutational processes generate variations in DNA that fuel tumor development. These processes include DNA damage due to exposure to environmental carcinogens and DNA repair. Different processes may lead to varying rates and types of mutations in cancers. Mutational processes can be inferred from whole-exome sequencing data using a computational method called mutational signatures framework. Sequencing tumors across populations can reveal population-specific signatures that can be mapped to specific environmental exposures or genetics. Knowing how mutational processes lead to tumor formation is key to understating the etiology of cancer. We analyzed The Cancer Genome Atlas data and discovered a mutational signature characteristic of homologous recombination deficiency (HRD). We found that this HRD signature was mainly attributed to germline mutations in BRCA1/BRCA2 in whites and promoter methylation of BRCA1/RAD51C in patients of African ancestry. Patients with BRCA mutation will likely benefit from cisplatin inhibitors in both neoadjuvant and at time of recurrence. Clinical trials suggest TNBC patients with methylation of BRCA1 are less likely to benefit from cisplatin at the time of recurrence. Hence our initial observation might indicate that black TNBC patients might benefit from other treatment strategies.

IA35 Molecular characterization of sessile serrated adenoma/polyps: A risk factor for higher colorectal cancer that further associates with endometrial polyps in female African Americans. [Hassan Ashktorab](#), Saman Azam, Babak Shokrani, Edward Lee, Taraneh Arjomand, Priyanka Kanth, Don Delker, Adeyinka Laiyemo, John Caretheres, Mehdi Nouraie, Hassan Brim. Howard University, Washington, DC.

Colorectal cancer is the third leading cause of cancer-related deaths in the United States, and rates are highest among African Americans (AAs). Sessile serrated adenoma/polyps (SSA/Ps) may be precursors to up to 30% of all colorectal cancers. Flat and mucinous features make SSA/Ps difficult to detect and diagnose. As such, there is a need for specific sensitive molecular biomarkers for an accurate and reliable diagnosis. Our aim was to assess the diagnostic value of molecular biomarkers that may distinguish SSA/Ps from benign hyperplastic polyps (HPs) among AA SSA/P patients. We conducted a retrospective study of all colonoscopies (n=12,085) performed at Howard University Hospital (2010-2015), which confirmed 4,070 AA patients with polyps, including 252 with SSA/Ps. Gene expression and mutation frequency profiles were analyzed in a total of 47 patients (62 specimens: 29 SSA/Ps, 26 HPs, 3 tubular adenomas, and 4 normal tissues). We tested 4 transcripts (MUC6, FSCN1, SEMG1, and TRNP1) using qRT-PCR. MSI and BRAF mutations were analyzed. CIMP analysis was performed using CACNA1G, IGF2, NEUROG1, RUNX, SOCS, and MLH1. In a parallel study, we assessed the association between endometrial polyp occurrence in patients with different types of colorectal lesions. MUC6, SEMG1, TRNP1, and FSCN1 were significantly more expressed in SSA/Ps vs. HPs (P<0.05; fold differences of 37.2, 10.7, 5.8 and 2.5, respectively). BRAF mutation was found in 55.6% of SSA/Ps vs. 12.0% in HPs (P = 0.001). The frequency of CIMP was higher in SSA/Ps but not statistically significant, while MSI was more prevalent in HPs (P > 0.05). There was a higher loss of MLH1 expression in HPs than SSA/Ps (42.9% showing expression vs 70.3% IHC staining >=2 in HPs and SSA/Ps). The SSA/Ps in our AA study were primarily distal (67%). In female patients, SSA/Ps associated with the higher frequency of endometrial polyps (8% vs. 2% in controls, p=0.003). Our results show that MUC6-SEMG1-TRNP1 expression and BRAF mutation have the strongest correlation with SSA/Ps. The distal location might help explain why MSI and CIMP may not be optimal molecular biomarkers in African American patients with SSA/Ps. These markers may be of high relevance for the diagnosis of ambiguous lesions and will benefit patients' management for scheduling follow-ups based on the nature of index lesions. Females with colon lesions of the SSA/Ps type might benefit from a screening for an endometrial polyp in an age-independent manner.

IA37 Survival by race and ethnicity in pediatric and adolescent patients with Hodgkin lymphoma: A report from the Children's Oncology Group. [Justine Kahn](#)¹, Kara M. Kelly², Qinglin Pei³, Rizvan Bush⁴, Debra L. Friedman⁵, Frank G. Keller⁶, Smita Bhatia⁷, Tara O. Henderson⁸, Cindy L. Schwartz⁹,

Sharon M. Castellino⁶. ¹Columbia University Irving Medical Center, New York, NY, ²Roswell Park Comprehensive Cancer Center, Buffalo, NY, ³Children's Oncology Group Statistics & Data Center, Department of Biostatistics, Gainesville, FL, ⁴Children's Oncology Group Statistics & Data Center, Monrovia, CA, ⁵Vanderbilt University School of Medicine, Nashville, TN, ⁶Emory University School of Medicine, Atlanta, GA, ⁷University of Alabama at Birmingham, Birmingham, AL, ⁸University of Chicago Comer Children's Hospital, Chicago, IL, ⁹Medical College of Wisconsin, Milwaukee, WI.

Background: While survival in Hodgkin lymphoma (HL) is excellent, disparities by race/ethnicity have been described. Population-based and single-center studies of children and adolescents with Hodgkin lymphoma (HL) report a survival disadvantage in non-Hispanic black (NHB) and Hispanic (vs. non-Hispanic white [NHW]) patients (Grubb, *Pediatr Blood Cancer* 2016; Metzger, *JCO* 2008). These studies, though suggestive of a significant public health disparity, are often limited by lack of information about disease characteristics and therapeutic exposures. Thus, whether racial/ethnic disparities persist after adjustment for clinical and treatment-related variables remains a subject of debate. We examined event-free survival (EFS) and overall survival (OS) in NHW, NHB and Hispanic patients receiving risk-stratified, response-adapted therapy for de novo HL on contemporary Children's Oncology Group (COG) trials.

Methods: This was a pooled analysis of individual, patient-level data from 1,605 children and adolescents (<1 – 21 years) enrolled on three consecutive phase III clinical trials for treatment of intermediate, low-, and high-risk HL (AHOD0031, AHOD0431, AHOD0831). Event-free survival and OS were compared between NHW and non-white patients (NHB and Hispanic) and were estimated using the Kaplan-Meier method. Cox Proportional Hazards for survival were estimated for both de novo and relapsed HL, adjusting for age, sex, insurance, histology, Ann Arbor stage, B-symptoms, bulk disease, COG study, and radiation therapy (RT).

Results: Between 2002 and 2012, 2,155 patients enrolled on COG trials for the treatment of newly diagnosed HL; 1,605 (76%) were included in this study. Patients treated outside of the United States (N= 299), with lymphocyte predominant histology (N= 86), and who withdrew consent after one cycle (N= 37), were excluded. For the purpose of this study, analyses were restricted to patients who were NHW, NHB, and Hispanic. In total, N= 49 patients who were Asian/Pacific Islander and N= 79 patients who were other/mixed race were excluded. Sixty-seven percent of the study cohort (N= 1,083) was NHW. Among non-white patients (N= 522), 13% were NHB and 20% were Hispanic. Median age was 14.6

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years (± 3.5 years). Approximately 16% of NHW patients vs. 41% and 44% of NHB and Hispanic patients had public or government insurance ($P < 0.01$). Non-white patients were also more to come from low-income households ($P < 0.01$). Compared with non-white patients, a higher proportion of NHW children had nodular sclerosing histology ($P < 0.01$). A higher proportion of non-white patients presented with stage III/IV (vs. I/II, $P < 0.01$) and bulky disease ($P = 0.04$); however, there was no difference in receipt of RT by race/ethnicity. At median follow-up of 6.9 years, cumulative incidence of relapse was 17% and did not significantly differ by race/ethnicity. Unadjusted 5-year EFS and OS were 83% (standard error [SE]: 1.2%) and 97% (SE: $< 1\%$), respectively, and neither differed by race/ethnicity. In multivariable analyses for OS, non-white patients had 1.88-times higher hazard of death (95% confidence interval [CI]: 1.1–3.3). Five-year post-relapse survival probabilities by race were NHW: 90%, NHB: 66%, Hispanic: 80% ($P < 0.01$). Compared with NHW patients, Hispanic and NHB children had 2.7-fold (95% CI: 1.2–6.2) and 3.5-fold (95% CI: 1.5–8.2) increased hazards of post-relapse mortality, respectively.

Conclusion: In the controlled setting of COG clinical trials, treatment with dose-dense, response-adapted therapy for newly diagnosed HL eliminates racial/ethnic differences in EFS. This observation suggests that current approaches to risk stratification with response-adapted regimens are highly effective for both NHW and non-white children with HL. Though there was no difference in EFS across NHW and non-white patients in our cohort, the striking difference in the risk of all-cause mortality lends weight to the possibility that differences in cancer therapy or supportive care outside of the cooperative group setting may be driving the disparities observed at the population level. Critical areas of future study to reduce racial disparities in HL should focus on improving health equity, expanding clinical trial participation, and identifying drivers of racial/ethnic disparities in children with relapsed disease.

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IA38 What causes the increased risk of acute lymphoblastic leukemia in Latinos?

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Acute lymphoblastic leukemia (ALL) is the most common childhood cancer and, despite high cure rates, remains one of the leading causes of cancer-related mortality in children. Moreover, childhood ALL survivors are faced with severe long-term treatment-related morbidities, including increased risk of cardiovascular disease, secondary cancers, and pulmonary disease. Children of Latino ethnicity have the highest incidence of ALL in the United States. This increased risk likely has a genetic component, although the rising incidence of ALL in recent decades, which is increasing fastest in Latinos, points towards a role for environmental exposures. In this talk, I will discuss recent research from our group and others that has shed light on the potential etiologies of the increased ALL risk in Latinos. Genome-wide association studies (GWAS) of childhood ALL have pinpointed several risk loci at genes involved in B-cell development and hematopoiesis. In our earlier studies of ALL in the genetically admixed Latino population of California, we capitalized on their altered linkage disequilibrium patterns (compared to non-Latino whites) to identify putative causal variants, including a missense SNP in CDKN2A. More recently, we performed a large multiethnic GWAS of ALL including Latinos, non-Latino whites, and African-Americans, and identified new ALL risk loci at 8q24 and IKZF3. Fine-mapping at known loci also helped to confirm an independent risk locus at chromosome 10p12.31 and pinpointed a likely causal variant in an enhancer region for BMI1. Our group and others previously showed that the risk allele frequencies of several loci, including ARID5B, PIP4K2A, and GATA3, are higher in Latino populations and are associated with Native American ancestry. In two recent, independent GWAS of ALL in Latinos, a novel risk locus was identified at the erythroblast transformation-specific (ETS)-related gene (ERG) on chromosome 21, which was found to confer stronger leukemia risk in Latinos than in non-Latino whites. Moreover, within Latinos the effect of this risk locus increased with increasing Native American ancestry. We subsequently confirmed ERG as the first identified genetic risk locus for ALL in children with Down syndrome (DS-ALL), in which the effect size was again stronger in Latino than in non-Latino white children with DS. Our research group has also identified varied associations between Latinos and non-Latino whites

for risk factors pertaining to immune stimulation (childhood contacts) and infection (cytomegalovirus). Future studies of ALL risk factors in Latinos, including even larger GWAS, polygenic risk score analysis, admixture mapping, as well as continued investigation of environmental risk factors, will be critical for our understanding the etiology of this disease and for identifying possible avenues to reduce the ethnic disparity in ALL incidence.

IA39 Inspiring hope, help, and healing: The hard work and heart work of cancer survivorship. [Jameisha Brown](#). Texas A&M University, College Station, TX.

Cancer is the leading cause of disease-related death in children and teens. However, medical milestones advance cancer treatments that help nearly 85% of children diagnosed with cancer live at least five years following diagnosis. Some children are ultimately considered cured. Consequently, there is an increasing interest in childhood cancer survivorship. The current aim is to increase quality of life by decreasing treatment toxicity and proactive surveillance of potential late effects through long-term follow-up. Brown will share her challenges and triumphs experienced from more than 20 years of childhood cancer survivorship, long-term follow-up, and patient and research advocacy.

IA40 Race-related liver tumor subtypes are associated with gut microbiome-mediated metabolism. [Xin W. Wang](#)¹, Anuradha Budhu¹, Jittiporn Chaisaingmongkol², Yotsawat Pomyen¹, Mathuros Ruchirawat², Tim F. Greten¹. ¹National Cancer Institute, Bethesda, MD, ²Chulabhorn Research Institute, Bangkok, Thailand.

Liver cancer has one of the fastest-rising incidence rates in the United States and across the world. It disproportionately affects men and individuals of Asian and African descent. Liver cancer consists of two main histologically distinct subtypes, i.e., hepatocellular carcinoma (HCC) and intrahepatic cholangiocarcinoma (iCCA) confined within the liver, whose diagnoses and treatment decisions are uniquely based on their baseline clinical features. However, both HCC and iCCA are genetically, etiologically, and biologically heterogeneous, and have a complex mutational landscape with vast intertumor and intratumor heterogeneity, which poses a major challenge to define actionable drivers. With the need of a well-annotated biobank to improve our understanding of disease susceptibility, progression, and outcome at a global level, we established the Thailand Initiative in Genomics and Expression Research for Liver Cancer (TIGER-LC) consortium to create a comprehensive

biorepository with biospecimens linked to etiologies and clinical features from 3,000 patients with liver cancer and 3,000 high-risk and healthy individuals who reside in Thailand. Here, by characterizing the first 199 sequentially enrolled Thai patients, we could demonstrate the presence of common molecular subtypes among HCC and iCCA patients in Thailand using state-of-the-art systems integration of genomics, transcriptomics, and metabolomics. While HCC and iCCA share recurrently mutated genes (TP53, ARID1A, and ARID2), mitotic checkpoint anomalies distinguish the C1 subtype with key drivers PLK1 and ECT2 from the C2 subtype, which is mainly linked to obesity, T-cell infiltration, and gut microbiome-mediated bile acid metabolism. Intriguingly, however, certain molecular subtypes were found in Asian, but less so in Caucasian, patients in our study, indicating geographic differences in disease presentation. Notably, Thai patients with the common C2 subtype showed elevated serum microbial metabolites, consistent with a potential effect of the local microbiome on tumor biology. In support of this hypothesis, we could demonstrate that gut microbiome-mediated bile acid metabolism regulates liver cancer via NKT cells in mice. Thus, HCC and iCCA, while clinically treated as separate entities, shared common molecular subtypes with similar actionable drivers and underlying tumor biology in an Asian patient population. However, our study also provides evidence of geographic disease heterogeneity and a rationale for liver cancer intervention based on regulating the balance of gut microflora.

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PRO1 The four-kallikrein panel discriminates prostate cancer and aggressive disease in a multiethnic population. [Burcu F. Darst¹](#), Peggy Wan¹, Alisha Chou¹, Emily Vertosick², David V. Conti¹, Lynne Wilkens³, Loic Le Marchand³, Andrew Vickers², Hans Lilja⁴, Christopher A. Haiman¹.

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Purpose: The four-kallikrein (4K) panel, commercially available as the 4Kscore, has been demonstrated to improve prediction of aggressive prostate cancer (PCa) compared to prostate-specific antigen (PSA) alone or PSA in combination with free PSA. However, the development and testing of the 4K panel has been limited to studies conducted primarily in White men.

Methods: We prospectively evaluated the 4K panel in a nested case-control study among African American (AA), Latino (LA), Japanese (JA), Native Hawaiian (NH), and White (WH) men in the Multiethnic Cohort (MEC). Prediagnostic blood levels of free, intact, and total PSA and human kallikrein-related peptidase 2 (hK2) were measured among 2,227 incident PCa cases and 2,189 controls. We used area under the curve (AUC) calculations to compare the discriminative ability of the 4K panel to PSA for overall PCa, Gleason-Grade Group (GGG) 2 or higher, aggressive PCa (Gleason >7, non-localized disease, or death from PCa), and death due to PCa within and across all racial/ethnic groups.

Results: The mean ages of the cases and controls at blood draw were 68 (range 47–86) and 69 (range 47–87), respectively, and for cases, samples were drawn an average of 4.9 years prior to their PCa diagnosis (range <1–18 years). For men with elevated PSA (≥ 2.0 ng/ml; 1,669 cases and 663 controls), the AUC for overall PCa was 0.76 (95% CI 0.74–0.78) for the 4K panel compared to 0.72 (95% CI 0.70–0.74) for free plus total PSA and 0.67 (95% CI 0.65–0.70) for total PSA alone. Discrimination was slightly enhanced for the 4K panel for GGG ≥ 2 (1,067 cases; 0.78 for panel versus 0.74 for free plus total PSA and 0.68 for total PSA only) and aggressive PCa (542 cases; 0.79 for panel versus 0.74 for free plus total PSA and 0.68 for total PSA only). Improvement of the 4K panel over total PSA alone was observed in each racial/ethnic group for all four PCa outcomes, most notably for GGG ≥ 2 (AA, 0.71 vs. 0.66; LA, 0.82 vs. 0.71; JA, 0.80 vs. 0.69; NH, 0.90 vs. 0.77; WH, 0.77 vs. 0.69) and aggressive

PCa (AA, 0.72 vs. 0.67; LA, 0.81 vs. 0.70; JA, 0.81 vs. 0.69; NH, 0.91 vs. 0.73; WH, 0.77 vs. 0.67).

Conclusion: The superior predictive ability of the 4K panel over PSA for overall and aggressive PCa across multiethnic populations indicates the broad clinical applicability of the 4K panel.

This abstract is also being presented as Poster A068.

PRO2 Identification of mechanisms of resistance to enzalutamide treatment using in vitro castration-resistant prostate cancer models. [Joakin O. Mori](#), Hui-Xian Lin, Jason White, Alahni Becks, Raven Williams, Clayton Yates, Honghe Wang. Tuskegee University, Tuskegee, AL.

Prostate cancer (PCa) disproportionately affect African American (AA) men. Compared to their European American (EA) counterparts, AA men are at higher risk of developing PCa and more likely to develop metastatic castration-resistant PCa (mCRPC). Enzalutamide (ENZ), a second-generation antiandrogen for treatment of mCRPC, prolongs survival of patients; however, its overall benefit is modest (4.8 months) and most patients relapse in less than two years. To date, the molecular mechanism underlying ENZ resistance has not been well illustrated. Identifying molecular pathways underlying hormone therapy resistance is critical for developing novel combinatorial therapies to inhibit resistance, prevent tumor recurrence, and extend patient survival. Presently, in vitro models commonly used for research on PCa are of EA origin. A primary versus mCRPC model specific to AAs was developed by subjecting primary prostate tumor cell lines (non CRPC/AA)—RC77T, RC43T, RC165T to invasion chamber and ENZ selection pressure. The resulting castration Resistant prostate tumor isogenic cell lines—RC77T-CR, RC43T-CR, RC165T-CR (CRPC/AA) were maintained in K-SFM containing 10 μ M MDV3100. The primary prostate tumor non-CRPC/AA cell lines were epithelial in appearance, while the CRPC/AA lines appeared mesenchymal. To identify transcriptomic signatures associated with acquisition of ENZ resistance, we profiled gene expression in ENZ-sensitive and -resistant mCRPC cells using RNA sequencing. Analysis revealed a panel of 352 genes differentially expressed between non CRPC/AA and CRPC/AA cells. Comparison of CRPC/AA and CRPC/EA cell lines (C4-2B, PC3 and DU-145) revealed 1,005 DEGs, suggesting a substantial difference between EA and AA cell line models. Comparison between CRPC/AA and CRPC/EA identified 2,802 DEGs, while up to 6,104 DEGs were identified between EA and AA cells lines. Overlapping DEGs in the ENZ-sensitive and -resistant cells were ranked by gene set enrichment

analysis (GSEA), which identified regulation of organelle organization, central nervous system development, regulation of hydrolase activity, cell proliferation, and regulation of cytokine production as the top five biologic pathways upregulated by the DEGs. *LEF1*, *IGF2BP1*, and *TBC1D3* were the three most common genes associated with upregulated biologic processes. On the other hand, *KRT4*, *EDAR*, *GJA5*, and *EDNA2* were the most common genes involved in downregulated biologic processes. The present results showed that different genes are expressed between EA and AA cell lines in general and between CRPC/EA and CRPC/AA. These transcriptional changes have potential for further study as predictive biomarkers and as targets of mCRPC treatment. Our findings suggest that RNA alteration profiling can identify potential mechanisms of ENZ resistance that may not only contribute to the recurrence of CRPC, but also serve as new targets for CRPC therapy.

This abstract is also being presented as Poster B072.

PRO3 Disaggregation of gastric cancer risk Between Asian American subgroups. [Robert J. Huang](#)¹, [Joo Ha Hwang](#)¹, [Ann Hsing](#)², [Latha Palaniappan](#)¹. ¹Stanford University School of Medicine, Stanford, CA, ²Stanford Cancer Institute, Stanford, CA.

Introduction: Within the United States (US), Asian/Pacific Islanders (APIs) are at increased risk for non-cardia gastric adenocarcinoma (NCGA) compared to non-Hispanic whites (NHWs). Previous epidemiologic research has treated APIs as an aggregated group for analysis; however, substantial genetic and environmental differences may exist within subgroups. Very limited data exist regarding gastric cancer epidemiology as stratified by API subgroup.

Methods: All incident cases of NCGA diagnosed in the years 2000-2014 were identified from the Surveillance, Epidemiology, and End Results Program registries incorporating California, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Atlanta, and New Jersey. API subgroup of patients was identified: Korean, Japanese, Chinese, Vietnamese, Filipino, and Indian. API subgroup population estimates were obtained from the American Community Survey. The age-adjusted incidence rates per 100,000 population and 95% confidence intervals (CIs) were generated for each subgroup, and among non-Hispanic whites (NHWs) for reference. The stages of diagnosis (as defined by National Cancer Institute summary stage) were compared between subgroups. Differences between subgroups in all-cause mortality following diagnosis were evaluated utilizing proportional hazards (PH) regression, adjusting for differences in tumor stage, age, and gender.

Results: There exist substantial differences in age-adjusted incidences of NCGA between subgroups: Koreans (34.8 per 100K), Japanese (17.0 per 100K), Vietnamese (14.6 per 100K), Chinese (11.2 per 100K), Indian (5.4 per 100K), and Filipino (5.3 per 100K). The incidence among NHWs was 3.8 per 100K. All API subgroups as well as NHWs demonstrated a decrease in age-standardized incidence over the study period. There exist differences in the proportion of cancers diagnosed at local stage: Koreans (37.8%), Japanese (28.1%), Chinese (25.7%), Vietnamese (24.4%), Indian (21.6%), Filipino (18.9%), and NHWs (23.7%). API subgroups had better overall survival from NCGA compared to NHWs (reference) in PH regression: Korean (HR 0.50, CI 0.47-0.54, $p < 0.001$), Japanese (HR 0.79, CI 0.74-0.85, $p < 0.001$), Vietnamese (HR 0.79, CI 0.72-0.87, $p < 0.001$), Chinese (HR 0.70, CI 0.65-0.74, $p < 0.001$), and Indian (HR 0.69, CI 0.58-0.81, $p < 0.001$). These differences remained significant even after adjustment for stage of diagnosis, age, and gender.

Discussion: Substantial heterogeneity in risk for NCGA exist between API subgroups. Korean Americans are at highest risk, with incidence nearly seven-fold higher than Filipinos and Indians (whose risk is similar to NHW). This suggests that the higher NCGA-risk in APIs in aggregate are driven by certain subgroups. Interestingly, Koreans, Japanese, Vietnamese, Chinese, and Indians all had better survival following NCGA diagnosis than NHWs, even after adjustment for stage of diagnosis. These epidemiologic data may hold important implications for gastric cancer screening or surveillance programs.

This abstract is also being presented as Poster B104.

PRO4 Understanding outcome disparities in multiple myeloma: A multiethnic comparison of clinical characteristics in Hispanics. [Alem A. Belachew](#), [Xiaohui Tang](#), [Lily K. Sandblom](#), [Luis A. Acevedo-Soto](#), [Robert Z. Orłowski](#), [Elisabet E. Manasanch](#), [Michelle A.T. Hildebrandt](#). The University of Texas MD Anderson Cancer Center, Houston, TX.

Purpose: Although Hispanics are the fastest-growing minority population in the United States, little is known regarding clinical attributes of multiple myeloma (MM) in this group. Here, we ascertain unique MM disease characteristics in Hispanics when compared to a multiethnic MM patient population.

Methods: Self-reported 152 Hispanic, 219 non-Hispanic black (NHB), and 275 non-Hispanic white (NHW) MM cases were selected from the MD Anderson Cancer Center Patient and Survivor Cohort. Patient demographics, history of premalignancy, MM (Ig) subtypes, and baseline diagnostic

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and prognostic indicators were then abstracted for each patient. Comparative cross-ethnic analysis was conducted using chi-squared tests and student t-tests as appropriate for categorical and continuous variables. Overall survival was determined from date of death or last date of follow-up, and Kaplan-Meier curves were utilized to visualize outcome by ethnic group.

Results: Hispanic MM cases were significantly younger (57.0) compared to NHW cases (62.1; $P=0.003$) and similar to NHB cases (57.4; $P=0.77$). IgG comprised the majority (54.3%) of MM subtypes in Hispanic patients, followed by IgA (24.5%) and light chain restricted (11.9%). Hispanics had the least incidence of premalignant MGUS and smoldering myeloma (8.50%) compared to NHB (21.9%; $P=0.0006$) and NHW patients (13.8%; $P=0.12$). Cross-ethnic assessment of baseline blood biomarkers revealed a significant difference in median beta-2-microglobulin levels between the Hispanic (4.60) and NHB (3.30) cases ($P=0.03$). In addition, baseline median hemoglobin levels in Hispanics (11.2) were significantly higher from that in NHB cases (10.0; $P=0.0001$) but were similar to NHW patients (11.2). Furthermore, the median M spike at diagnosis was significantly lower in Hispanics (2.45) compared to both NHW (3.4) and NHB (3.4) study groups ($P=0.011$ for both). Interestingly, the median overall survival time for Hispanic patients (63.9 months) was 15 months longer than NHB (48.8 months; log-rank $P=0.10$) and over 21 months longer than NHW MM patients (42.4 months; log-rank $P=0.016$).

Conclusion: We identified distinct clinical features in Hispanic MM patients that differed from NHW and NHB cases. Findings of our study may provide a better understanding for cancer diagnosis and management in the Hispanic populations. Ongoing efforts include assessing differences by genetic ancestry to refine clinical characterization among this highly admixed population.

This abstract is also being presented as Poster B097.

PRO5 A meta-analysis of genome-wide association study and eQTL analysis of multiple myeloma among African

Americans. Zhaohui Du¹, Niels Weinhold², Gregory Chi Song², Kristen A. Rand³, David J. Van Den Berg¹, Amie E. Hwang¹, Xin Sheng¹, Victor Hom¹, Sikander Ailawadhi⁴, Ajay K. Nooka⁵, Seema Singhal⁶, Karen Pawlish⁷, Edward Peters⁸, Cathryn Bock⁹, Ann Mohrbacher¹⁰, Alexander Stram¹¹, Sonja I. Berndt¹², William J. Blot¹³, Graham Casey¹⁴, Victoria L. Stevens¹⁵, Rick Kittles¹⁶, Phyllis J. Goodman¹⁷, W. Ryan Diver¹⁴, Anselm Hennis¹⁸, Barbara Nemesure¹⁸, Eric A. Klein¹⁹, Benjamin A. Rybicki²⁰, Janet L. Stanford¹⁶, John S. Witte²¹, Lisa Signorello¹²,

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Background: Persons of African ancestry (AA) experience a 1.5-2-fold risk of multiple myeloma (MM) compared to persons of European ancestry (EA). We assembled a set of MM patients with self-reported AA in order to evaluate the contribution of genetics to etiology in this high-risk group.

Methods: Here we present the results of a meta-analysis of two GWAS in 1,813 cases and 8,871 controls of AA. We also conducted an admixture mapping scan to identify risk alleles associated with local ancestry, fine-mapped the 23 known susceptibility loci to find markers that could better capture MM risk in individuals of AA, and constructed a polygenic risk score (PRS) to assess the aggregated effect of known MM risk alleles. Finally, we conducted an eQTL analysis measuring gene expression in those genes harboring a risk variant in malignant plasma cells from 292 of the patients from a single site.

Results: In GWAS analysis, we identified two suggestive novel loci located at 9p24.3 and 9p13.1 at $P < 1 \times 10^{-6}$, but no genome-wide significant association was noted. In admixture mapping, we observed a genome-wide significant inverse association between local AA at 2p24.1-23.1 and MM risk in AA individuals. 20 of the 23 known EA risk variants showed directional consistency and 9 replicated at $P < 0.05$ in AA individuals. In eight regions, we identified markers that better capture MM risk in persons of AA. AA individuals with a PRS in the top 10% had a 1.82-fold (95%CI: 1.56, 2.11) increased MM risk compared to those with average risk (25-75%). The strongest functional association was between the risk allele for variant rs56219066 at 5q15 and lower ELL2 expression ($P = 5.1 \times 10^{-12}$).

Conclusion: Our study shows that common genetic variation contributes to MM risk individuals of AA.

This abstract is also being presented as Poster C040.

PR06 Exposure to phthalates and risk of invasive breast

cancer: The Multiethnic Cohort Study. Anna H. Wu¹, Adrian A. Franke², Chiuchen Tseng¹, Shannon M. Conroy³, Yuqing S. Li³, Mindy DeRouen⁴, Linda Polfus⁵, Christian Caberto², Daniel Stram¹, Chris Haiman¹, Lynne R. Wilkens², Loic Le Marchand², Iona Cheng⁴. ¹University of Southern California, Los Angeles, CA, ²University of Hawaii, Honolulu, HI, ³University of California Davis, Davis, CA, ⁴University of California San Francisco, San Francisco, CA, ⁵University of Southern California, Los Angeles, CA.

Background: Phthalates (Phth), known endocrine-disruptors, may play a role in breast carcinogenesis. Low-molecular-weight phthalates (LMWPhth) are commonly found in personal care products while high MWPhth (HMWPhth) are used primarily as plasticizers. Individual Phth may disrupt normal mammary gland development and promote tumorigenesis by binding to and activating the estrogen receptor (ER).

Methods: We prospectively examined the association between pre-diagnostic urinary levels of Phth metabolites and breast cancer risk in a case-control study nested within the Multiethnic Cohort (MEC). We measured 11 Phth metabolites and phthalic acid from overnight/first morning urine samples of 798 women with invasive breast cancer (355 Japanese Americans, 218 Whites, 125 Native Hawaiians, 62 Latinos, and 38 African Americans; the latter three groups were combined due to small numbers) and 796 matched controls using an ultrasensitive isotope dilution orbitrap LCMS assay after hydrolysis from conjugation, extraction, and concentration. Average time between urine collection and breast cancer diagnosis was 5.5 years (SD=3.3). Cases and controls were 1:1 matched on area (Hawaii or California), birth year (± 1 year), race/ethnicity, urine type (overnight or first morning), and date of urine collection (± 1 year). Association of LMWPhth (MBP, MiBP, MEP, MMP), HMWPhth (MBzP, MEHP, MEHHP, MEOHP, MECPP, MCMHP, MCHP), and total Phth exposure (LMWPhth + HMWPhth), and phthalic acids with breast cancer risk were examined using conditional logistic regression. All models were adjusted for creatinine levels, demographics, and potential confounders (e.g., education and established breast cancer risk factors). Stratified analyses were conducted by race/ethnicity and ER and progesterone receptor (PR) status.

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Results: Women in the highest tertile (T3) of total Phth exposure showed a significant increased risk of breast cancer compared to women in the lowest tertile (T1) (HR=1.36, 95% CI: 1.02-1.82). The association was suggested across race/ethnicity with a statistically significant positive association observed in the three smaller groups combined (Native Hawaiians, Latinos, and African Americans) with HR for T2=2.29 (95% CI: 1.27-4.41) and HR for T3=2.42 (95% CI: 1.25-4.70); Ptrend=0.006. By ERPR status, risk associations tended to be stronger for ER-PR- (n=96 cases) (HR=1.13, 95% CI: 0.89-1.45) than for ER+PR+ (n=694 cases) (HR=1.06, 95% CI: 0.94-1.19) breast tumors. Among the three smaller groups combined, total Phth exposure was associated with a significant increased risk of ER-PR- breast cancer (n=38 cases) (P=0.045).

Conclusion: This is one of the first studies of Phth exposure and breast cancer to include large numbers of diverse populations in a single study. Risk patterns were stronger among the combined group of Native Hawaiians, Latinos, and African American and for ER-PR- breast cancer. Better understanding of these differences in risk associations by race/ethnicity and ERPR status is needed.

This abstract is also being presented as Poster D100.

PRO7 Lung cancer incidence and risk factors in never-smoking Asian American, Native Hawaiian, and Pacific Islander women: A multilevel dataset of electronic health record, cancer registry, and environmental data.

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Background: For Asian American, Native Hawaiian, and Pacific Islander (AANHPI) females, lung cancer is one of the most common cancers and the leading cause of cancer death. More than half of AANHPI female lung cancers occur in never-smokers, and contributing risk factors among never-smokers remain largely unknown. Until now, there was no single sufficiently large data source to document lung cancer incidence rates by smoking status and sex among specific AANHPI ethnic groups, which is central to understanding and reducing the burden of this disease in this population.

We assembled a large-scale cohort to quantify the burden of lung cancer by smoking status among single- and multiethnic AANHPI groups, with an emphasis on identifying the underlying factors driving lung cancer risk among never-smoking AANHPI females.

Methods: Assembly of the cohort involved (1) harmonizing and pooling electronic health record (EHR) data on known and putative lung cancer risk factors from two large health systems (i.e., Northern California Sutter Health system and Kaiser Permanente Hawaii (KPH)), (2) linking EHR data from Sutter and KPH with tumor and diagnosis data from the California Cancer Registry and Hawaii Tumor Registry, respectively, (3) geocoding and linking the Sutter portion of the cohort to regional air pollutant data and data on specific neighborhood contextual factors from the California Neighborhoods Data System, and (4) developing neighborhood contextual variables to enhance the geocoded data for KPH cohort members. Incidence rates stratified by sex, detailed race/ethnicity, smoking status, and lung cancer histology have been calculated; as well as incidence rate ratios by race/ethnicity.

Results: The cohort comprises over 2.3 million individuals (250,000 AANHPI females) followed up to 15 years for incident lung cancer. It includes over 6,000 incident lung cancer cases, of which 558 are AANHPI females. Among AANHPI female groups, proportions of lung cancers among never-smokers range from 31% among Native Hawaiian to 88% among Chinese females. Incidence rates of never-smoking lung cancer are highest among Native Hawaiian females (AAIR, 28.7) and Asian females reporting multiple races/ethnicities (AAIR, 27.8).

Conclusions: We have assembled a large, integrated dataset well suited to study multilevel risk of lung cancer that will serve as a critical evidence base to inform screening, research, and public health priorities, especially among AANHPI females. Ongoing work will include longitudinal analyses of lung cancer risk among never-smoking AANHPI females, including absolute risk modeling, examining six exposure domains representing known and putative lung cancer risk factors.

This abstract is also being presented as Poster A104.

PRO8 Neighborhood-level social determinants impact non-small cell lung cancer aggressive somatic phenotypes.

Loretta Erhunmwunsee, Hengrui Hu, Catherine Raquel, Lisa N. Lopez, Jenny Shen, Lennie Wong, Jae Y. Kim, Dan J. Raz, Karen L. Reckamp, Ravi Salgia, Stacy W. Gray. City of Hope, Duarte, CA.

Background: It is unclear why poor Americans die of non-small cell lung cancer (NSCLC) at a significantly higher rate than their affluent counterparts. We aimed to evaluate the relationship between (1) social determinants of health (SDH) (e.g., pollution, education), (2) cigarette smoke, and (3) aggressive NSCLC somatic biologic phenotypes (e.g., KRAS G12C and G12V and TP53 mutations) in smoking and nonsmoking patients with NSCLC. We hypothesize that adverse social determinants will be associated with more aggressive NSCLC tumor biology.

Methods: We conducted a single institutional retrospective cohort study of patients seen at the City of Hope National Medical Center from 2015-2018. Clinical data were obtained from electronic medical records. Risk factor data (air quality measure [PM 2.5 exposure], neighborhood-level income, education, and minority population data) were obtained from the Environmental Protection Agency (EPA). Associations were modeled using logistic regression models, controlling for all demographic variable (TP53) or variables significant on bivariate analyses (KRAS variants G12C and G12V).

Results: Of 812 NSCLC patients, 617 (76%) had somatic genomic testing and were included in analyses (mean age 67.6, 53% female, 30% Asian, 4% African American, 64% White, 10% Hispanic, 64.3 % Stage 4, 83% adenocarcinoma, and 38% never smokers). Smokers had a mean pack-year of 20. 22% of patients had KRAS mutations and 42.6% had TP53 mutations. For neighborhood level exposures, the mean PM 2.5 level was 11.7 $\mu\text{g}/\text{m}^3$ (US average is 9.5 $\mu\text{g}/\text{m}^3$). Patients were almost evenly distributed in the good and moderate PM2.5 risk categories (good 47.6%, moderate 52.4%). There was no overall association between SDH and KRAS mutations. However, multivariable analyses revealed that lower neighborhood education (OR=15.98, 95%CI 1.5-170.4) was associated with KRAS variants G12C and G12V specifically. Poor air quality as measured by PM2.5 was associated with TP53 mutations (OR=2.09, 95%CI 1.33-3.29).

Conclusion: Poor air quality is associated with increased risk of TP53 mutations, while low neighborhood-level education is associated with KRAS G12C/G12V mutations. Our study finds a link between adverse neighborhood-level social determinants and aggressive biologic NSCLC behavior. These hypothesis-generating findings suggest a mechanism by which deprived NSCLC populations may experience inferior outcomes. Larger, prospective studies are needed to further evaluate these associations.

This abstract is also being presented as Poster C054.

PR09 Racial disparities in health insurance status of U.S. adults with hematologic malignancies in states with and without Medicaid expansion: Analyses from the National Cancer Database, 2007-2016. Gregory S. Calip¹, Naomi Y Ko², Karen I. Sweiss¹, Pritesh R. Patel¹, Brian C.-H. Chiu³. ¹University of Illinois at Chicago, Chicago, IL, ²Boston University School of Medicine, Boston, MA, ³University of Chicago, Chicago, IL.

Introduction: Lack of health insurance is an important determinant of cancer health disparities in the United States. For patients with hematologic malignancies, breakthroughs in novel chemotherapeutics, targeted therapies, and stem cell transplantation are counterbalanced with concerns for financial toxicity and lack of access without adequate health coverage. Our objective was to measure racial differences in uninsured rates among patients with hematologic malignancies in states with and without Medicaid expansion under the Affordable Care Act.

Methods: We conducted a hospital-based retrospective cohort study of adults aged 40-64 years diagnosed with hematologic malignancies (lymphoma, multiple myeloma, leukemia, and Waldenstrom macroglobulinemia) between 2007 and 2016 using the National Cancer Database (NCDB). We collected information on demographics, clinical characteristics, insurance coverage, socioeconomic factors, and state Medicaid expansion status. We grouped Medicaid expansion states as: (i) non-expansion states, (ii) early expansion states (2010-2013), and (iii) late expansion states (2014-2016). Covariate adjusted difference-in-differences (DID) analyses were performed to determine changes in the percentage of uninsured hematologic malignancy patients over time. In modified Poisson regression models, we calculated adjusted rate ratios (RR) and 95% confidence intervals to identify disparities in uninsured rates among black, Hispanic, and Asian/Pacific Islander (API) patients compared to white patients by time period and Medicaid expansion.

Results: An overall cohort of 338,353 hematologic malignancy patients (median age: 56 years; 43% female) residing in Medicaid non-expansion (n=124,875), early expansion (n=60,305) and late expansion (n=153,173) states were included. Compared to 2007-2009, the proportion of uninsured patients was lower in 2014-2016 across all states; however, more substantial decreases in percentage uninsured occurred in states with Medicaid expansion (4.9% to 2.5%, diff 2.4%) versus states without expansion (9.4% to 8.3%, diff 1.1%; DID -1.3, P<0.01). These reductions were consistent among white (DID -1.1, P<0.01) and Hispanic (DID -4.3, P<0.01) patients; however, decreases in uninsured rates among black (DID -0.3, P=0.67) and API (DID 1.9, P=0.41) patients were not

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statistically significant. Regardless of expansion status, racial disparities persisted over time with racial and ethnic minority patients having a 1.5- to 3.0-fold higher likelihood of being uninsured compared to white patients.

Conclusions: Our study found that the proportion of uninsured hematologic malignancy patients in the NCDB decreased between 2007 and 2016, but this reduction was significantly greater in states with Medicaid expansion. We also identified racial disparities where black and API patients experienced minimal decreases attributed to Medicaid expansion and black, Hispanic, and API patients were consistently more likely to be uninsured over time.

This abstract is also being presented as Poster A115.

PR10 Emergency department-mediated cancer diagnosis in the United States. [Caroline A. Thompson](#)¹, [Paige Sheridan](#)², [James D. Murphy](#)², [Georgios Lyratzopoulos](#)³. ¹San Diego State University, San Diego, CA, ²University of California San Diego, San Diego, CA, ³University College London, London, United Kingdom.

Background: It is estimated that 20-50% of breast, colon, and lung cancers are diagnosed in an emergency department (ED) globally. Cancer diagnosis via the ED increases time to treatment, worsens short-term survival, and reduces quality of care. Studies in Europe have shown that older, racially diverse, and socioeconomically deprived patients are at a higher risk of ED diagnosis. However, no studies in the U.S. have reported patterns of cancer patients initially presenting to the ED. We identified and characterized patients who were diagnosed with a malignant tumor following presentation to an ED using data from the Surveillance, Epidemiology and End Results (SEER) Medicare-linked database.

Methods: We studied 415,395 Medicare beneficiaries with histologically confirmed first malignant invasive tumors of the breast, colon and rectum, lung, and prostate between 2004 and 2013. Patients were excluded if they did not have continuous coverage in the year prior to diagnosis, had more than one primary tumor, or were diagnosed after death. ED-mediated diagnosis was defined as having at least one ED claim in the month before the date of cancer diagnosis. Covariate adjusted generalized linear models were used to estimate prevalence odds ratios for race/ethnicity, comorbidity, and income levels. A secondary analysis examined associations stratified by the presence of an outpatient clinic visit in the year prior to diagnosis as a proxy for having any usual source of care.

Results: Overall, 42,186 (11%) of cancer diagnoses were ED-mediated (by site: breast: 5%, colorectal: 13%, lung: 15%, prostate: 6%). Patients presenting to the ED were more likely to be: unmarried (OR:1.32; 95% CI: 1.29-1.34), Hispanic (OR:1.47; 95% CI: 1.37-1.57) or Black (OR:1.41; 95% CI:1.37-1.45), have 3+ comorbidities (OR:3.08; 95% CI: 3.00-3.16), and in the lowest income quartile (OR:1.26; 95% CI:1.21-1.30). In stratified analyses income was more strongly associated with emergent presentation among patients with no usual source of care.

Conclusions: This is the first study to describe patterns and predictors of ED-mediated cancer diagnosis in the U.S. We found that minority patients and those with lower SES were more likely to present with cancer via the ED. While some cancers diagnosed in the ED may indicate incidental findings, later-stage symptomatic cancers not identified until they become an emergency may reflect the failure of public health campaigns and primary care services. Reducing emergency presentation of cancer patients may improve patient outcomes and health care system efficiency. Further research is needed to uncover symptomatic and incidental pathways to diagnosis and to identify targets for interventions.

This abstract is also being presented as Poster A132.

PR11 Development of a prostate cancer care and survivorship intervention trial for ethnically diverse Black men. [Folakemi Odedina](#)¹, [MaryEllen Young](#)¹, [Getachew Dagne](#)², [Jennifer Nguyen](#)³, [Ernest Kaninjing](#)⁴, [Nissa Askins](#)¹. ¹University of Florida, Orlando, FL, ²University of South Florida, Tampa, FL, ³Mercer University, Atlanta, GA, ⁴Georgia College, Milledgeville, GA.

Introduction: Research on the physical, psychosocial, and economic effects and coping mechanisms used by Black men from the time of prostate cancer (CaP) diagnosis to survivorship is limited. The result of the limited research on CaP care and survivorship (CaPCaS) is lack of tailored behavioral intervention programs focused on assisting Black men through the CaPCaS process. Using the principles of community engagement research, we (1) employed a Grounded Theory study design to develop a CaPCaS model for Black men and (2) developed and tested the efficacy of CaPCaS video documentary designed to assist newly diagnosed Black men in coping with their diagnosis and transitioning effectively through the CaPCaS process.

Methodology: Black CaP survivors were identified through the Florida Cancer Data System. For aim 1, semistructured interviews were conducted to collect data from participants using audio, video, and Photovoice recordings on

participants' experiences on CaP prevention, detection, diagnosis, treatment, survivorship, and advocacy. Using an iterative process, we developed the CaPCaS model for Black men. For aim 2, we developed the CaPCaS video documentary based on the ethnographic data collected from aim 1. Subsequently, we tested the efficacy of the CaPCaS video documentary among Black men relative to assisting them across the CaPCaS process.

Results: The study comprised 10,818 Black men diagnosed with CaP. Of the 10,818 participants, the birthplaces of 4,117 Black men were identified, which allowed us to classify them into three ethnic groups: US-born (63.5%), African-born (0.9%), and Caribbean-born (35.6%). We found significant differences among these men relative to smoking status, age at CaP diagnosis, and first-course therapy for CaP. To develop the CaPCaS model, we reached data saturation with 32 participants for the Grounded Theory study. The CaPCaS model that was developed represented the trajectory of CaP prevention, screening, diagnosis, treatment, survivorship, and advocacy. An unexpected unique theme that emerged is the Point of Prostate Cancer Diagnosis (PPCD) Model. The PPCD interpretative framework provides information that can be used by physicians to prepare for their PPCD consultation with Black men as well as develop a support system for Black men at the PPCD. We also developed CaPCaS video documentary for each of the CaP care continuum phases (see: https://www.dropbox.com/sh/c4g49x47n9jx2fp/AACHF8vnI_5H6MB00U3mN9rla?dl=0). The videos were tested among 17 Black men. Satisfaction and quality were rated high for all 6 videos. In addition, there was improvement in the attitude, beliefs, perceived behavioral control, and knowledge of participants after the CaPCaS videos' intervention.

Conclusion: Through the Florida CaPCaS project, we have developed 6 video interventions based on the CaP experiences of ethnically-diverse Black men. The videos provide Black men the ability to connect with and learn from survivors who have gone through CaP diagnosis.

This abstract is also being presented as Poster B013.

PR12 Using whole exome sequencing of archived FFPE tissue to characterize the mutational landscape of prostate cancer in Nigerian men. Prostate Cancer Transatlantic Consortium Members¹, Jason White², Wei Tang³, Stefan Ambs³, Solomon Rotimi⁴, Mohammed Faruuk⁵, Folakemi Odedina⁶, Clayton Yates². ¹Prostate Cancer Transatlantic Consortium Members, ²Tuskegee University, Tuskegee, AL, ³National Cancer Institute, Bethesda, MD, ⁴Covenant

University, Ota, Ogun State, Nigeria, ⁵Ahmadu Bello University, Zaria, Kaduna State, Nigeria, ⁶University of Florida, Gainesville, FL.

Compared to other ancestral groups, men of African ancestry (MAA) have the highest incidence and mortality of prostate cancer (PCa), with African men having the highest. Multiple studies have demonstrated that genetic/biologic differences in African American (AA) tumor biology contribute to PCa development and aggressiveness; furthermore, building evidence suggests that the observed differences are population specific and form unique paths to cancer aggressiveness. Despite this, MAA continue to be underrepresented in PCa studies. This lack of adequate representation greatly diminishes the ability to identify clinical interventions to address this disparate disease. In this study, we used whole-exome sequencing of 148 Nigerian PCa FFPE samples (75 Tumor, 62 BPH, and 11 non-matched Normal) to determine the mutational landscape of PCa. Samples were collected from 6 sites in central and southwest Nigeria and quality screened. Samples passing QC were sequenced (Illumina HiSeq 4000 PE150) and read files were processed using the Tumor Only Somatic Mutation pipeline developed by the CCR Collaborative Bioinformatics Resource (CCBR). In addition to the CCBR pipeline, Exomiser was used to prioritize non-silent variants according to variant frequency, pathogenicity, quality, and model organism phenotype data. 246 genes showed significant ($p \geq 0.05$) tumor mutation and high prioritization (Exomiser score ≥ 0.75). These genes included BCR, KMD1A, MSH6, TLR4, and BMPR1B with mutation rates of 17%, 13%, 12%, 11%, and 8%, respectively. These rates were higher than process matched controls and TCGA tumor samples. Mutation signature analysis showed enrichments in 4 Cosmic signatures. 38.6% of Tumor samples contained signatures similar (cosine similarity [cs] = 0.912) to Signature 1, 29.3% were similar (cs = 0.849) to Signature 4, 14.6% were similar (cs = 0.743) to Signature 5, and 17.3% were similar (cs = 0.635) to Signature 25. Groupwise comparisons of gene mutations and mutation signatures showed that 8 of the 29 tumors ($p \leq 0.06$), having a Signature 1 similar signature, contained a BCR frameshift insertion (c.3275_3278dup), which duplicates a four-nucleotide CCGG sequence in exon 19. The relationship between BCR and prostate cancer is still poorly understood; however, within the TCGA PRAD cohort, low BCR expression does significantly ($p \leq 0.024$) correlate with poor survival. These results suggest that mutations within BCR result in a disruption of methylation and expression patterns that could contribute to worse outcomes in Nigerian PCa patients. Without tumor/normal matched pairs, more analysis is needed to ensure the accuracy of this characterization;

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however, completion of this study would comprise the largest mutational analysis of Nigerian PCa to date. Understanding the genetic underpinnings of PCa in Nigerian patients will add much-needed context to the study of the disease in MAA, further illuminating clinical interventions that may prove beneficial in diminishing outcome disparities.

This abstract is also being presented as Poster B079.

PR13 Loss of alpha-catenin expression is associated with race, aggressive disease, and chemoresistance in triple-negative breast cancer. [Rania Bassiouni](#)¹, Sandeep Singhal², Lee D. Gibbs¹, Yunchi Li¹, Patrick Pirotte³, Nasreen Vohra⁴, Kevin Gardner², John D. Carpten¹. ¹University of Southern California, Los Angeles, CA, ²Columbia University Medical Center, New York, NY, ³Translational Genomics Research Institute, Phoenix, AZ, ⁴East Carolina University, Greenville, NC.

Triple-negative breast cancer (TNBC) is an aggressive and difficult-to-treat subtype of the disease. A well-documented health disparity exists within TNBC: African American (AA) women are more likely to be diagnosed with and die from the disease. Our group previously reported homozygous deletions in the CTNNA1 gene, which encodes the protein alpha-catenin, in AA TNBC. We have undertaken a basic and translational research study to understand the mechanistic role and clinical impact of alpha-catenin loss in TNBC, particularly in AA patients. To explore the association of alpha-catenin loss with race, we first examined gene expression data available in the TCGA. We determined that race was significantly associated with alpha-catenin expression, with lower expression found in AA patients. We also found a significant over-representation of AA patients in the lowest subset of expressers. We validated this association in an independent, racially diverse cohort comprising 460 breast cancer patients. Interestingly, we observed loss of nuclear alpha-catenin specifically to be associated with race. We also found strong associations between low alpha-catenin expression and survival, tumor stage, and lymph node metastasis. While its junctional role has been well studied, little is known about nuclear alpha-catenin and its role in disease. To understand the nuclear function of alpha-catenin, we sought to identify its nuclear binding partners by performing co-immunoprecipitation followed by mass spectrometry. We found nuclear alpha-catenin to interact with ATR, a kinase critical to the DNA damage response and G2/M checkpoint. To determine whether loss of alpha-catenin affected ATR function, we developed several isogenic cell line pairs. Using CRISPR/Cas9-mediated gene editing, we generated CTNNA1 knockout BT-549, MB-MDA-436, and MDA-MB-231 cell lines. We also reintroduced

CTNNA1 into MDA-MB-468 cells—a line derived from an AA woman with an endogenous deletion in CTNNA1. Using these models, we found that loss of alpha-catenin promoted greater ATR activation in response to DNA damage. This was accompanied by increased phosphorylation of downstream effector proteins, including Chk1 and RPA2. Consistent with ATR hyperactivation, we found cells lacking alpha-catenin to be more sensitive to inhibitors of ATR and the G2/M checkpoint kinases Chk1 and Wee1. Additionally, alpha-catenin loss promoted DNA damage repair, thus decreasing sensitivity to DNA-damaging chemotherapies clinically utilized for TNBC treatment. In our studies, we have identified nuclear alpha-catenin as a tumor suppressor that effects TNBC's susceptibility to chemotherapy by playing a role in ATR-directed DNA repair. Our data suggest that loss of alpha-catenin is more common in AA patients, and is associated with aggressive disease and poor prognosis. Therefore, CTNNA1 status may be important in determining appropriate therapeutic strategies for this subset of patients, which is disproportionately affected by the disease.

This abstract is also being presented as Poster B088.

PR14 Dietary folate and prostate cancer tumor aggressiveness differences between African Americans and European Americans. [Daniela Ramirez Aguilar](#)¹, Susan E Steck², Hui-Yi Lin³, LJ Su⁴. ¹Fay Boozman College of Public Health, University of Arkansas for Medical Sciences, Little Rock, AR, ²Department of Epidemiology and Biostatistics, The Cancer Prevention and Control Program, University of South Carolina, Columbia, SA, ³Department of Biostatistics, The Louisiana State University Health Sciences Center, New Orleans School of Public Health, New Orleans, LA, ⁴Fay Boozman College of Public Health, Department of Epidemiology, University of Arkansas for Medical Sciences and Winthrop P. Rockefeller Cancer Institute, Little Rock, AR.

Introduction: Folate is a water-soluble B vitamin, which is involved in DNA synthesis and repair and in regulation of gene expression through DNA methylation as a methyl donor. Despite the confirmed beneficial effect on the prevention of neural tube defect, concerns have been raised on high intakes of folate and its synthetic form, folic acid, may promote carcinogenesis or cancer progression. African American (AA) males tend to have a more aggressive prostate cancer tumor diagnosis compared to European American (EA) males.

Objective: This aim of this study is to examine the association between folic acid intake in the year prior to PCa diagnosis among AAs and EAs. Using a population-based case-only study, an examination of folic acid was conducted

to evaluate the effects of dietary folate on prostate cancer aggressiveness.

Methods: Data from the North Carolina-Louisiana Prostate Cancer Project (PCaP) questionnaire were used to evaluate 1,497 participants (AA n = 722 and EA n = 775) with a low or high aggressiveness prostate cancer to assess dietary folate intake one year prior to PCa diagnosis using the National Cancer Institute Dietary History Questionnaire. High-aggressive disease was defined as Gleason sum ≥ 8 , or prostate-specific antigen (PSA) >20 ng/mL, or Gleason score ≥ 7 and clinical stage T3-T4, while low-aggressive disease was defined as Gleason sum <7 and stage T1–T2 and PSA <10 ng/mL. All four variables for dietary folate (natural folate, synthetic folate, folate, and dietary folates) were examined. Multivariate logistic regression was used to assess dietary folate and prostate cancer aggressiveness. Confounding variables considered for this analysis include age, BMI, total energy (kcal), education level, and first-degree family history of PCa. Additionally, dietary folate was categorized into tertiles. Models were stratified by race and the dose-response relationship was evaluated.

Results: Folate intakes, regardless natural folate (mean = 354.5 vs 304.1), synthetic folate (176.3 vs 157.5), or total dietary folate equivalent (654.0 vs 571.5), were higher among AA than EA, respectively. Based on the tertile categorization, the highest dietary folate was significantly associated with high-aggressive prostate cancer when compared to the lowest intake group among AA and EA combined (odds ratio (OR) = 1.41, 95% confidence interval (CI) = 1.04 – 1.90) after adjusted for confounders. Stratified model by race showed that there is an increased trend in PCa aggressiveness and increased folate intake (2nd tertile OR = 1.03, 95%CI = 0.67 – 1.56; 3rd tertile OR = 1.41, CI = 1.11 – 2.48), p-value for trend = 0.01. The association was not observed among EA. The trend is very similar regardless of natural or synthetic folate.

Conclusion: It appeared that AA with high folic acid intake had a greater chance of being diagnosed with high-aggressiveness PCa, while the association was not observed among EA. The finding suggests that the metabolism of folate may be different between AA and EA, possibly due to genetic polymorphisms.

This abstract is also being presented as Poster C034.

PR15 Intratumoral heterogeneity in Latino gastric

adenocarcinomas. Ted Toal¹, Guadalupe P. Echeverry¹, Ruta Sahasrabudhe¹, Mabel Bohorquez², Javier Torres³, Shiro Urayama⁴, Amanda Kirane⁴, Magdalena Echeverry², [Luis G. Carvajal Carmona](#)¹. ¹University of California Davis, Davis, CA, ²Universidad del Tolima, Ibague, , Colombia, ³Instituto Mexicano de Seguro Social, Mexico City, Mexico, ⁴University of California Comprehensive Cancer Center, Sacramento, CA.

The goal of this study was to examine gastric (stomach) cancer mutational intratumoral heterogeneity (ITH) in Latinos using multiregion sequencing (MSEQ). Gastric cancer is the 2nd leading cause of cancer-related death worldwide. It is diagnosed in 25,000 Americans each year, with Latinos twice as likely to succumb as Whites. Treatment is currently limited to a few molecularly guided therapies, but TCGA data show that 70% of GC patients have a mutation in a gene targetable with existing drugs. Significant ITH has been identified in a variety of tumor types to date, although a GC study has yet to be published. ITH is an important consideration for personalized therapy. Driver gene mutations are frequently found to be nonclonal, a crucial factor when assessing effective druggability. In this study, two to five tumor biopsies and adjacent normal tissue were obtained from 33 Latino patients, totaling 120 tumor (T) biopsies and 33 normal (N) samples. DNA was extracted from the tissues and the coding regions of 762 cancer-related genes were sequenced using Agilent target enrichment and Illumina sequencing. For each biopsy, estimates were made of sample purity and ploidy, somatic mutations were called using joint analysis of all T and N sequence data for each patient, cancer cell fraction (CCF) was estimated for each mutation, and copy number variation (CNV) was called across the genome. Somatic mutations and copy number changes were analyzed for clonality in each patient. We found a high degree of heterogeneity, both intratumoral and interpatient, with the fraction of functional somatic mutations that are clonal ranging from 0 to 68%, the fraction private to one biopsy ranging from 32% to 100%, and the fraction shared between multiple but not all biopsies ranging from 0 to 42%. For 10 of the 33 samples there was at least one gene, containing a clonal functional mutation, for which there is an FDA-approved targeted therapy. In summary, our study is the first to assess ITH in GC. Our results are important to understand the genetic diversity and clonal architecture of these tumors and to improve molecular diagnostics.

This abstract is also being presented as Poster D107.

PROFFERED ABSTRACTS

PR16 Association of renal cell carcinoma subtypes with race/ethnicity and comorbid medical conditions. Daphne Y. Lichtensztajn¹, Brenda M. Hofer², John T. Leppert³, James D. Brooks⁴, Benjamin I. Chung⁴, Sumit A. Shah⁴, Mindy C. DeRouen¹, Scarlett L. Gomez¹, [Iona Cheng](#)¹. ¹University of California San Francisco, San Francisco, CA, ²California Cancer Reporting and Epidemiologic Surveillance (CalCARES) Program, University of California, Davis, Sacramento, CA, ³Veterans Affairs Palo Alto Health Care System and Stanford University School of Medicine, Palo Alto, CA, ⁴Stanford University School of Medicine, Stanford, CA.

Background: Renal cell carcinomas (RCC) comprise distinct subtypes that differ in molecular characteristics and prognosis. The distribution of these subtypes varies by race/ethnicity. Hypertension, obesity, chronic kidney disease, and diabetes have been associated with increased risk of RCC, and emerging evidence suggests that the risk may be subtype specific. We assessed whether race/ethnicity and comorbidities were independently associated with RCC subtypes.

Methods: Using population-based data from the California Cancer Registry linked to the Office of Statewide Health Planning and Development, we identified non-Latino White, non-Latino Black, Latino, and Asian/ Pacific Islander adults diagnosed with their first microscopically confirmed RCC between 2005 and 2015. Diagnosis of hypertension, diabetes, and kidney disease was defined by ICD-9 and ICD-10 codes present prior to RCC diagnosis. We used multivariable logistic regression to model the association of the three main RCC subtypes (clear cell, papillary, and chromophobe) with race/ethnicity adjusting for comorbidity, sex, neighborhood socioeconomic status, age, and year of diagnosis.

Results: Of the 40,016 cases of RCC included, 62.6% were clear cell, 10.9% papillary, and 6.0% chromophobe. There were striking differences in the proportion of clear cell and papillary subtypes by race/ethnicity, ranging from 40.4% clear cell and 30.4% papillary in non-Latino Black adults to 70.7% clear cell and 4.5% papillary in Latino adults. The prevalence of comorbid conditions also varied by race/ethnicity—most notably the greater prevalence of kidney disease in the non-Latino Black group. In multivariable analysis, non-Latino Black individuals had a higher likelihood of presenting with papillary (odds ratio (OR) 3.35, 95% confidence interval (CI) 3.05-3.68) and chromophobe (OR 1.23, 95% CI 1.06-1.44) subtype compared to those identified as non-Latino White. In contrast, both Latino and Asian/ Pacific Islander individuals were more likely than those of non-Latino White race/ethnicity to present with clear-cell subtype (OR 1.48, 95% CI 1.41-1.56 and OR 1.30, 95% CI

1.20-1.40, respectively). Clear-cell subtype was associated with diabetic renal disease (OR 1.39, 95%CI 1.23-1.58) and uncomplicated diabetes (OR 1.29, 95% CI 1.22-1.37), while papillary subtype was associated with hypertension (OR 1.22, 95% CI 1.13-1.32), hypertensive renal disease (OR 1.53, 95% CI 1.34-1.75), and end-stage renal disease (OR 1.55, 95% CI 1.31-1.84).

Conclusion: In addition to race/ethnicity, specific comorbidities are associated with RCC subtype. The association of diabetes, hypertension, and end-stage renal disease with RCC subtype may provide clues to disease etiology as well as avenues for disease prevention.

This abstract is also being presented as Poster D119.

POSTER SESSION A

A001 Improving cancer germline testing in rural

Appalachian populations with ORIEN. [Jill Kolesar](#)¹, Micheal Cavnar¹, Rachel Miller¹, Justine Pickarski¹, Shulin Zhang¹, Kannabiran Nandakumar¹, Marissa Schuh¹, Elizabeth Belcher¹, Eric Durbin², Ming Poi³, Fred Ueland¹, Isaac Hands¹, Therese Bocklage¹, JC Jeong¹, Susanne Arnold¹, Mark Evers¹. ¹University of Kentucky, Lexington, USA, ²Kentucky Cancer Registry, Lexington, USA, ³M2GEN, Tampa, USA.

Background: Reduced access to treatment advances in rural populations contributes to increased cancer mortality. Rural Appalachian Kentucky is a geographically isolated population with a unique carcinogen exposure and a low frequency guideline-recommended germline testing. To improve testing rates, a return of germline results program for patients enrolled in the Total Cancer Care (TCC) protocol at Markey Cancer Center (MCC) was initiated. Methods: Pre-intervention testing rates were obtained from the electronic health record. Patient and physician focus groups were conducted to assess barriers to germline testing. Whole exome germline data from TCC patients enrolled in the Avatar subset is analyzed using standard bioinformatics pipeline for known, clinically significant mutations in the 59 American College of Medical Genetics (ACMG) genes where return of incidental germline findings is recommended and 21 pharmacogenetic genes. Results are reviewed by our Molecular Tumor Board and a recommendation for confirmatory clinical testing, if needed, is made to the treating physician. Results: Baseline rates of guideline recommended germline testing at MCC in 2018 was 20% of ovarian, 15% of breast, 9% of colon, 3% of pancreas and no metastatic prostate patients. Testing was infrequent in rural communities. Almost all patients who had testing recommended by their physician, had testing performed. Unaffected family members were also rarely tested. Physician focus groups at MCC identified lack of time and low perceived value of the testing as barriers. Rural physicians also identified lack of access to genetic counselors. Patient focus groups in the Appalachian region demonstrated poor quality internet and low knowledge and self-efficacy as major barriers to patients discussing genetic testing with family members. To overcome patient barriers, a preloaded audio card was developed to facilitate discussion with family members. The preloaded audio card was tested in a rural Appalachian community, demonstrating significantly improved knowledge and self-efficacy. To overcome physician barriers, a genetic counselor telemedicine clinic and standing order were initiated. To improve physician perception of test value, the ORIEN return of germline results project was initiated. Of the more than 2000 patients enrolled on TCC at MCC, approximately 40% are from Appalachia, 173 have appropriate consent and specimen availability for germline

sequencing and 5 have had results returned. Data describing the first 3 months of this initiative, including frequency of mutations in patients and unaffected family members and acceptance of genetic counselor referrals by physicians, patients and family members will be presented. Conclusion: Rural Appalachian communities identified significant barriers to guideline recommended germline testing, however, ORIEN and the TCC protocol are novel methods to reduce these barriers and improve the rates of testing in both patients and their family members.

A002 Use of electronic health record data to improve generalizability of social support research in cancer: CRN pilot study. [Candyce H Kroenke](#), Elizabeth Eldridge. Kaiser Permanente Northern California Division of Research, Oakland, CA, USA.

Abstract Background: Social support is an important predictor of breast cancer treatment adherence, quality of life, and survival. However, prior research has been predominantly representative of non-Latina white women and those with common breast cancer subtypes. We considered whether information from the electronic health record (EHR) could be developed and used to enhance representativeness of social support research in breast cancer. Methods: We conducted interviews with oncologists, breast care coordinators, nurse practitioners, and social workers to determine the nature and extent of social support data collection in patients with breast cancer and/or information in the EHR that might help to identify patients with low social support. We also reviewed EHR records for variables that have been used to measure structural and functional support. We included in our analysis 27,584 patients diagnosed with invasive breast cancer in Kaiser Permanente Northern California (KPNC) from 2006-2017. We evaluated concurrent validity of potential social support measures against levels of the gold standard Medical Outcomes Study Social Support measure, collected in the Pathways Study, a study of 4,505 women with stage I-IV invasive breast cancer. We further evaluated predictive validity of measures with overall mortality using National Death Index data. Finally, we evaluated the performance of an index based on the sum of widely available variables and mortality in the total population; scores ranged from 0 (low social support)-4 (high social support). Results: Variables widely available in the EHR included marital status, living status (i.e., whether living alone or with someone), religious status (i.e., indicator of religious involvement or not), availability of information about an emergency contact, and ICD V- and Z- codes for social problems. Variables

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determined to be not widely available included: support person on day of visit, transportation issues, and detailed descriptions of social support. Marital status, religious status, living status, presence of an emergency contact, and presence of ICD codes for social problems were each related to less than median levels of social support in Pathways. All indicators predicted subsequent patient mortality except living status which modified the association of the other predictors. Adjusted for age at diagnosis, race/ethnicity, and AJCC stage, compared to women with four points (high support) (reference), women with 3, odds ratio (OR)=1.31, 95% confidence interval (CI): 1.21-1.43; 2, OR=1.62 (1.46-1.80); and 0-1 (low support), OR=1.96 (1.54-2.49) points, had elevated risks of mortality; the association was larger in those who lived alone. We had adequate statistical power to explore associations in racial/ethnic subgroups and in women with triple negative breast cancer. Conclusions: Variables available in the EHR may be used to measure social support in breast cancer patients.

A003 Disparities in postoperative complications and 90-day unplanned readmission following surgery for head and neck cancer.

Ricardo J Ramirez, Patrik Pipkorn, Angela L Mazul, Dustin Stwalley, Jose P Zevallos. Washington University in St. Louis, St. Louis, MO, USA.

Head and neck cancer (HNC) is the eighth most common cancer in the United States with over 64,000 new cases and 14,000 deaths annually. Racial-ethnic and socioeconomic disparities have contributed to long-term mortality and overall worse oncologic outcomes in HNC patients. Despite robust research on differences in long-term morbidity and survival outcomes, there have been no studies comparing outcomes in the acute postoperative period. Our study aimed to determine whether racial-ethnic and socioeconomic status (SES) are risk factors for major complications occurring in the postoperative-inpatient setting following ablative surgery for HNC. A retrospective cohort study was performed using the State Inpatient Database from the state of New York from 2006-2015. Patients with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code for HNC and an ICD-9-CM procedure code for ablative surgery present during the same admission were identified. Patients living outside of New York state, under the age of 18, and those with missing data were excluded. Exposures were race, SES and comorbidities. The primary outcome of interest was major perioperative complication, as defined by the Clavien-Dindo classification for surgical complications grades III-V. Minor complications (grades I-II) are ICD-9-CM codes for any unanticipated event, grade

III for a subsequent intervention, grade IV for single- or multi-organ dysfunction, and grade V for death. Secondary outcomes were inpatient mortality and 90-day unplanned readmission. We used a multivariable logistic regression with an alpha of 0.01. We identified 23,066,146 available records. After applying inclusion/exclusion criteria, our final cohort consisted of 8,564 patients. White middle-aged males made up approximately two-thirds of the patient cohort. Black patients accounted for 10%, Hispanics 8%, Asians 4%, and other/multiracial 11% of included patients. Thirty-nine percent of patients had private insurance while 14% had Medicaid. The most common procedure was glossectomy (34%) and the most common diagnosis was oropharyngeal cancer (25%). Forty-one percent of patients experienced a surgical complication. Major complications accounted for 55% of all complications. There were 105 inpatient deaths for an inpatient mortality rate of 1%. On multivariable analysis, race was not associated with major complication while Medicaid payer status was predictive (aOR: 1.53, 99% CI: 1.20-1.79). Race and SES were not associated with inpatient mortality. Median household income below the second quartile was associated with increased risk of 90-day unplanned readmission (aOR: 1.28, 99%CI: 1.02-1.62). Despite prior studies showing racial-ethnic cancer disparities in long-term outcomes, race is not associated with differences in acute postoperative outcomes. Disadvantaged SES, however, is associated with increased risk of surgical complications grades III-V and 90-day unplanned readmission.

A004 Introducing single-cell sequencing genomic DNA copy number analysis to study cancer heterogeneity in renal cell carcinoma and its potential benefits in cancer health disparities research.

Enrique I. Velazquez Villarreal, David W. Craig, John D. Carpten. USC Dept. of Translational Genomics, Los Angeles, CA, US.

Renal cell carcinoma (RCC) is one of the most lethal urological malignancies and is responsible for around 80 percent of all primary renal neoplasms. In the US, every year are reported approximately 74,000 new cases and almost 15,000 deaths. It has been reported significant racial disparities in survival for renal cell carcinoma (RCC) between African Americans patients (AA), Hispanics and Caucasians Americans (CA) but more efforts are needed in order to have a high resolution genomic profile of the tumor. Currently, RCC has been characterized by extensive cancer heterogeneity using bulk sequencing. In order to get new insight in the study of RCC cancer heterogeneity, we applied DNA single cell sequencing since it has the potential to improve our understanding of this genetic feature by providing sub-

clonal and variant information in high resolution. To this end, we studied cancer heterogeneity applying single cell copy number analysis and clonotype detection in four RCC tumors. 10x Chromium™ Technology was used for processing single cells. This technology provides 100 Kb CNV events, calling clonotypes down to 10 of 1000 cell inputs. The most representative sample resulted with more than 50% of tumor content. Analysis of the tumor cells showed variable median ploidies. In addition, regional copy number was estimated by processing our data in 20 Kb cases of reads. Multiple sub-clones were identified in sample number one where four clusters of sub-clones characterized cancer heterogeneity. By using Fast maximum-likelihood and Bayesian Information Criterion, the clustering process were implemented on the most representative sample to select the optimal clustering solution. This allowed us to provide a better insight of sub-clonal evolution. We detected copy number changes on entire chromosome arms and mutations at variant detection level. For this last, we identified previously reported VHL gene mutations that have been reported in RCC samples as signatures of clinical prognosis. The use of single cell copy number analysis has the potential to uncover and characterize the evolution of hidden sub-clones, highlighting their important uses in cancer health disparities research to identify genomic racial differences in RCC risk and progression of AA, Hispanics and CA patients.

A005 Would black women benefit from a screening mammography schedule that differs from that recommended for the overall population? A simulation modeling study. *Christina H Chapman*¹, Clyde Schechter², Amy Trentham³, Ron Gangnon³, Chris Cadham⁴, Jeanne Mandelblatt⁴. ¹University of Michigan, Ann Arbor, MI, USA, ²Albert Einstein University, Bronx, NY, USA, ³University of Wisconsin, Madison, WI, USA, ⁴Georgetown University, Washington, DC, USA.

Background: For breast cancer, black women experience younger mean age at diagnosis, higher incidence of triple negative disease, and higher mortality compared to the overall population. These epidemiological differences raise the question of whether different screening mammography schedules for black women might produce similar benefit-to-harm ratio as those currently recommended for the overall population. Methods: We used the Georgetown-Einstein Cancer Intervention and Surveillance Modeling Network (CISNET) model to compare the benefit-to-harm ratios of a variety of digital mammography screening schedules for black women and white women. We updated the models with a variety of race-specific inputs, including

non-breast cancer (competing) mortality, breast density, mammography sensitivity, breast cancer incidence with and without screening, estrogen (ER) and Her-2 receptor distributions, and stage distributions. Within age, stage, and ER/Her-2 receptor strata, we assumed that breast cancer biology was the same across races, as reflected by equal sojourn, stage dwell time and treatment efficacy. The objective of this study was to isolate the impact of screening mammography, not to quantify the impact of differences in screening or treatment completion on disparities. Therefore, in keeping with previously published methods, we assumed 100% dissemination of screening mammography and adjuvant treatment for all races. We investigated annual, biennial, and hybrid screening strategies beginning at age 40, 45, or 50 and concluding at age 74 (e.g. "A40-B50-74" means annually starting at age 40, then biennially at age 50, then stopping at age 74). We quantified the number of mammograms (M), overdiagnoses, false positives (FP), breast cancer deaths averted (BCDA), life years gained (LYG) and their benefit-to-harm ratios (LYG:M, BCDA:M, LYG:FP, BCDA:FP). Results: Biennial strategies (B50-74, B45-74, B40-74) have approximately equal incremental benefit:harm ratios and are superior to annual or hybrid strategies. Hybrid strategies A40B50-74 and B40A50-74 are sometimes efficient, depending on the metric, but have lower incremental benefit:harm ratios than the biennial strategies. Results were similar for black and white women. Conclusions: Despite the fact that black women have a younger mean age at diagnosis, higher incidence of triple negative disease, and higher breast cancer mortality, the relative benefits of different screening mammography schedules do not appear to differ between black and white women. These findings do not support different screening guidelines for black and white women. Future analyses will investigate whether potential racial differences in treatment efficacy might change the relative benefits of different screening mammography schedules.

A006 Multi-modal estimation of causal influences of environmental agents on colorectal cancer in an understudied population. *Hadiza Galadima*¹, Georges Adunlin², James Blando¹. ¹Old Dominion University, Norfolk, Virginia, USA, ²Samford University, Birmingham, Alabama, USA.

Background: While there is a well-established causal relationship between several individual factors and contextual socioeconomic status with colorectal cancer, there is still a lack of strong evidence that the prevalence of environmental agents is independently associated with colorectal cancer

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in various geographical areas. Population-based studies assessing the causal relationship between environmental agents and colorectal cancer are limited by the scarcity of comprehensive data. Most previous studies have relied on the recall of self-reported exposures. Objective: In this study, we provide new and important insights by integrating publicly available 'big data' resources with hospital data to identify causal influences on colorectal cancer in an understudied rural population in Virginia. Methods: Data linkage was achieved by geocoding patients zip codes at diagnosis and spatially assigning contextual and environmental data to the hospital cancer records. Machine learning imputation methods were used to fill in the missing values that resulted from the linkage. A "Big Data" science approach was used to develop a multi-scale modeling of individual and contextual data with national and local exposomes from environmental exposures sources. The methodology is based on training a Bayesian causal network to better understand the causal inference from individual and contextual level data, as well as environmental exposures data on the outcomes of colorectal cancer. The primary source of data for this project is the Sentara Cancer Registry (SCR). The SCR collects data on cancer cases from eight Sentara hospitals. The information collected by SCR includes patient characteristics and clinical outcomes. The secondary source of data come from the U.S. Census Bureau (Census 2010). This data source is used to determine zip-code level socioeconomic status of each colorectal cancer case. Environmental data such as water quality, Superfund site locations, toxic release sites, and heavy metals were obtained from the Virginia Department of Environmental Quality. Environmental data was supplemented with Toxics Release Inventory (TRI) database, considered to be the most comprehensive data source on industrial toxic emissions in the US. Conclusion: This study contributed to the scientific innovation of leveraging mixed-methods data collection by building a comprehensive database for cancer research in an understudied population.

A007 Using latent class modeling to characterize exposome impacts on health disparities. [Alexandra Larsen](#)¹, [Viktoria Kolpacoff](#)¹, [Victoria Seewaldt](#)², [Terry Hyslop](#)¹. ¹Duke University, Durham, NC, USA, ²City of Hope, Monrovia, CA, USA.

Recent work suggests that air pollutants, toxic chemicals, and other environmental exposures negatively impact health in a synergistic way. We hypothesize that these environmental exposures will vary with socioeconomic status (SES), and urban versus rural location, and contribute to health disparities. In order to measure and understand this phenomenon, we propose a latent class mixture model

of multi-pollutant exposures and SES. This builds on our previous development of an SES mixture model, which includes 13 indicators of socioeconomic advantage (eg profession, education) and disadvantage (eg unemployment, single-parent households, etc). Our model identifies levels of joint exposure to three classes of toxic pollutants: volatile organic compounds (VOC), particulate matter (PM) and heavy metals (HM). We use publicly available data from the American Community Survey and the EPA, including the National Air Toxics Assessment (NATA), for the 2,174 census tracts in North Carolina (NC). Model results indicate that mixtures of 2 levels of pollutants, 2 levels of socioeconomic advantage and 2 levels of socioeconomic disadvantage best fit data for NC. We present estimated class-membership for the state of NC, where 34.1% of the census tracts exhibit high disadvantage, 66.3% have low advantage, and 59.2% of census tracts have high mixtures of toxic pollutants. While frequently observed in urban or regional city/suburban areas, our model shows that rural areas are detected at the highest levels of pollution as well. Areas of high advantage are focused on urban/suburban and coastal areas, while disadvantage dominates the eastern half of the state as well as many urban areas. Areas with higher SES disadvantage had significantly higher black population density ($p < 0.001$). Similarly, black population density was higher in areas with higher pollution ($p < 0.001$). Our next focus is to incorporate spatial correlations into our models to better characterize the interactive nature of multi-pollutant and economic exposures, and apply to specific cohorts with cancer outcomes. Taken together, these extensions will be incorporated into a holistic, exposome modelling framework for estimating disparities in cancer survival.

A008 Racial differences in patterns of health care access in a cohort of cancer survivors: A latent profile analysis approach. [Cleo A. Samuel](#)¹, [Wendi Elkins](#)², [Xianming Tan](#)³,

[Giselle Corbie-Smith](#)⁴, [Samuel Cykert](#)⁵, [Olive Mbah](#)², [Neda R. Padilla](#)⁶, [Jeannette T. Bensen](#)⁷, [Laura Farnan](#)⁶, [Antonia V. Bennett](#)⁸, [Donald Rosenstein](#)⁹, [Hanna Sanoff](#)¹⁰, [Bryce B. Reeve](#)¹¹. ¹Department of Health Policy and Management, Gillings School of Global Public Health and Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ²Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ³Department of Biostatistics, and the Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ⁴Department of Social Medicine and Department of Medicine, Center for Health Equity Research, UNC-Chapel Hill School of Medicine, Chapel

Hill, NC, USA, ⁵Division of General Medicine and Clinical Epidemiology, UNC-Chapel Hill School of Medicine and Lineberger Comprehensive Cancer Center, UNC-Chapel Hill, Chapel Hill, NC, USA, ⁶Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ⁷Department of Epidemiology, Gillings School of Public Health and the Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ⁸Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ⁹Department of Psychiatry, UNC-Chapel Hill School of Medicine and Lineberger Comprehensive Cancer Center, UNC-Chapel Hill, Chapel Hill, NC, USA, ¹⁰NC Cancer Hospital and Department of Medicine at the University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ¹¹Department of Population Health Sciences, Duke University School of Medicine, Durham, NC, USA.

Background: Racial disparities in health care experiences and access are well documented. Yet, little is known regarding racial variations in the confluence of multiple health care access (HCA) experiences among cancer patients. We identified cancer patient subgroups with similar, co-occurring HCA experiences, and evaluated racial differences in HCA subgroup membership. Methods: We obtained data on Black and White cancer patients enrolled in the University of North Carolina Health Registry/Cancer Survivorship Cohort during 2010 to 2016. Participants included patients with breast, gastrointestinal, genitourinary, and head/neck cancers, who completed a baseline questionnaire assessing demographics, health history, health-related quality of life, and health care experiences. HCA was assessed along five domains (i.e., doctor interpersonal manner, doctor communication, financial burden, time spent with doctor, accessibility/convenience) using the RAND Patient Satisfaction Questionnaire. We used latent profile analysis to identify subgroups of patients with similar HCA experiences. Modified Poisson regressions were estimated to assess racial differences in HCA subgroup membership, adjusting for patient clinical and demographic characteristics. Results: Our analysis included 393 Black (14.8%) and 2265 White (85.2%) participants. The latent profile analysis resulted in an optimal solution of 5 HCA profiles/subgroups, ranging from Low to High HCA. Members of profile 1 (6.0% of sample) reported “Low” HCA along all HCA domains. Profile 2 (10.8%) consisted of individuals reporting low scores on every HCA domain except “financial burden,” where scores were moderate. Profile 3 (49.9%) members exhibited moderate scores on each HCA domain, while members of profile 4 (11.7%) reported moderate HCA scores on most HCA domains, with the exception of low

scores on “financial burden.” Profile 5 (21.7%) was comprised of patients reporting “High” HCA along every HCA domain. In unadjusted χ^2 comparisons, Black patients were more likely to be in the “Low” HCA group (Profile 1) than Whites (11.1% vs. 5.3%, $p < 0.001$), but less likely to be in the “High” HCA group (13.2% vs. 22.8%, $p < 0.001$). In adjusted regressions predicting subgroup membership, Black race was associated with a 34% lower likelihood of membership in the “High” HCA subgroup (adjusted risk ratio [ARR]=0.66; CI:0.51-0.87). Other patient characteristics associated with “High HCA” subgroup membership included holding a post-graduate degree (ARR=1.33; CI:1.06-1.68) and being married (ARR=1.22; CI:1.03-1.44). Conclusions: Distinct patterns of co-occurring HCA experiences exist among cancer patients, with Black patients reporting worse care experiences relative to Whites across multiple HCA domains. Our findings point to potential opportunities for identifying and intervening on patient subgroups especially vulnerable to worse outcomes due to their collective HCA experiences.

A009 Explaining racial disparities in cancer-related pain: Are they driven by health care access or social determinants of health?

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Background: Pain is one of the most commonly reported cancer symptoms. Pain burden varies by race, with Black patients reporting worse pain management than their White counterparts. There is a longstanding debate regarding the relative contributions of health care access (HCA) and social determinants of health (SDoH) to health outcomes; however, information regarding the impact HCA and SDoH on pain-related disparities is limited. We assessed pain disparities in a cohort of cancer patients and evaluated the extent to which HCA and SDoH mediate racial disparities in pain. **Methods:** We obtained data on Black and White breast, gastrointestinal, genitourinary, and head/neck cancer patients enrolled in the University of North Carolina Health Registry/ Cancer Survivorship Cohort during 2010 to 2016. Participants completed a baseline survey assessing social factors, health history, symptoms, and health care experiences. The primary outcome was a binary measure of moderate-to-severe pain. Based on latent profile analyses, HCA was categorized into 5 subgroups ranging from “Low” to “High” HCA measured along 5 domains (doctor interpersonal manner, doctor communication, financial burden, time spent with doctor, accessibility/convenience). The SDoH measures included education, income, insurance, rurality, and marital status (indicator of social support). We estimated modified Poisson regressions assessing racial disparities in pain (Model 1) and the mediating effects of HCA (Model 2) and SDoH (Model 3), adjusting for patient clinical characteristics. **Results:** Compared with Whites (N=2265), Blacks (N=393) were more likely to report moderate-to-severe pain (25.2% vs. 40.8%; $p<.001$), but less likely to report “High” HCA (22.8% vs. 13.2%; $p<.001$), a bachelor’s degree or higher (47.8% vs. 24.8%; $p<.001$), incomes above the federal poverty level (53.6% vs. 33.7%; $p<.01$), having insurance (96.6% vs. 91.8%; $p<.001$), being married (70.8% vs. 45.8%, $p<.001$), or residence in an urban county (74.4% vs. 69.7%, $p=.04$). In clinical characteristic adjusted analyses (Model 1), Black race was associated with a 46% higher risk of reporting moderate-to-severe pain (adjusted odds ratio [AOR]=1.46; 95%CI:1.27-1.69). Although “Low” HCA was associated with worse pain (“Low” vs “High” HCA AOR=1.78; 95%CI:1.42-2.24), HCA adjustment (Model 2) did not strongly mitigate racial disparities in pain (Black AOR=1.41; 95%CI:1.22-1.63). However, further adjustment for SDoH factors (Model 3) accounted for roughly half of the observed racial gap in pain (Black AOR=1.18; 95%CI:1.03-1.37). In particular, higher education

(AOR=0.61; 95%CI:0.49-0.76) and marriage (Black AOR=0.84; 95%CI:0.74-0.96) were protective against worse pain burden. **Conclusions:** Racial disparities in cancer-related pain burden exist and are partly explained by SDoH, rather than solely HCA experiences. These findings highlight the importance and relevance of prioritizing SDoH within health systems in order to advance oncology care optimization and equity.

A010 Hidden figures – an example of using machine learning to prioritize cervical cancer screening

outreach. Katherine Y Tossas, Jenna Khan, Robert A Winn. University of Illinois Cancer Center, Chicago, IL, USA.

Background: Cervical cancer (CC) – one of the most preventable malignancies, is best known for its impact to women in developing countries. The mortality-to-incidence (MIR) ratio worldwide is approximately 0.53, versus 0.29 in the US. However, hidden in this figure are women from places such as the predominantly African American community of West Garfield Park in Chicago which has a CC MIR of 0.63, comparable to a developing country. We need simple, versatile tools to identify women at increased risk for late-stage at CC diagnosis. **Purpose:** We test the feasibility of using machine learning to examine individual and census tract level predictors of a late-stage CC diagnosis in order to prioritize education, screening, and vaccination. **Methods:** For this analysis, we used a dataset with 164 CC cases diagnosed at the University of Illinois Cancer Center (UICC) between 2001 and 2018, and 46 (individual and neighborhood-level) attributes. We used the recursive partitioning approach with inverse probability weighting to generate a decision tree with a set of logical if-then conditions for predicting late stage at CC diagnosis. **Results:** The age at CC diagnosis for women in this dataset ranged from 22 to 80, with a mean of 47 years of age. Roughly half of the patients were African American (54%), ever smokers (47%), ever screened for CC (52% compliant, 15% delayed screeners), and had a history of an abnormal pap result (57%). Overall, 15% of the women were diagnosed at later stages (3, 4 or 5). The estimated accuracy of the fitted model was 91%. Based on the decision tree, the highest (71%) predicted probability of a late-stage CC diagnosis was estimated for the subgroup of women who resided in census tracts where: less than 12% of residents had long work commutes (in excess of 60 minutes); >and 30% of residents spent over 50% of their household income on rent; and >12% of households were female-headed with children. Conversely, the lowest predicted probability (6%) of a late-stage CC diagnosis was estimated for women from census tracts where 12% or more of residents reported long work commutes, and whose individual BMI was <19, and who lived

within 10 miles of UICC. These results align with hot spot analysis results for these data showing two main clusters in neighborhoods on the south and west sides of Chicago with similar characteristics to those derived from the decision tree. Conclusions: The decision tree approach of machine learning generated a simple algorithm that identified subgroups at high risk for late stage at CC diagnosis. Though results lack generalizability and suffer from inherent overfitting, they have logical validity. Properly trained and tested in a validation set, this approach may be particularly useful to population-level cancer disparity researchers to identify most relevant individual and neighborhood-level characteristics and appropriate cut points, uncover hidden vulnerable subpopulations and partner with communities to inform strategies for interventions.

A012 Comparison of NNAL exposure and menthol cigarette use among Black smokers. Denise Gibbs¹, Elizabeth Blackman², Yin-Ming Kuo³, Andrew Andrews⁴, Karthik Devarajan⁴, Camille Ragin². ¹Cancer Prevention and Control Program, Fox Chase Cancer Center-Temple Health, African-Caribbean Cancer Consortium, Philadelphia, PA, USA, ²Cancer Prevention and Control Program, Fox Chase Cancer Center-Temple Health, Department of Epidemiology and Biostatistics, College of Public Health, Temple University, African-Caribbean Cancer Consortium, Philadelphia, PA, USA, ³Department of Radiology, University of Pennsylvania School of Medicine, Philadelphia, PA, USA, ⁴Cancer Prevention and Control Program, Fox Chase Cancer Center-Temple Health, Philadelphia, PA, USA.

Introduction: In the U.S., there is little information available on gender differences in menthol cigarette smoking use among Black smokers. NNAL, has been studied as a carcinogenic biomarker of tobacco and second-hand smoker exposure. Total NNAL was analyzed to compare gender differences in NNAL exposure and menthol cigarette use among Black smokers. Method: Urine samples were collected from 117 current smokers who self-reported as persons of African descent and participated in the Cancer Prevention Project of Philadelphia. Participants completed overall health and wellness questionnaires that included information on tobacco use. Samples were analyzed for NNAL using an ultra-performance liquid chromatography with tandem mass spectrometry along with urinary creatinine for NNAL normalization and urine flow correction. We compared mean NNAL concentrations and tobacco metabolism phenotype and menthol cigarette use by gender. Results: Our preliminary results are reported for 48 current smokers, 20 males and 28 females. The majority were daily smokers

(males, 80%, females 68%). The majority of participants reported using mentholated cigarettes (total 63%, males 76.9% vs. females 54.6%, $p=0.508$). Tobacco exposure based on mean NNAL concentrations was higher but not significantly different between males (268 pg/mg creatinine \pm 498 SD) and females (159 pg/mg creatinine \pm 121 SD; $p=0.645$, Wilcoxon rank-sum test). Similarly tobacco exposure based on number of cigarettes per day was not (males 7.2 ± 6.6 cig/day vs. females 10.5 ± 7.8 cig/day, $p=0.139$ Wilcoxon rank-sum test). Of those who reported use of filtered or mentholated cigarettes there was no significant difference according to sex ($p>0.05$). Mean NNAL was higher in Black men who smoked mentholated cigarettes compared to Black women but did not reach statistical significance ($p=0.598$, Wilcoxon rank-sum test). The majority of smokers were poor metabolizers of tobacco (total 60%, males 60%, females 61%, $p=0.261$). For those who reported use of mentholated cigarettes there was no significant difference in metabolizer phenotype between males and females ($p=0.655$). Conclusion: As expected Blacks more often report using mentholated cigarettes and there was no significant difference between males and females for tobacco exposure and metabolism. Our analyses are ongoing as we investigate these findings to address gender differences and health disparities among smokers of African descent in a larger study sample.

A013 “You can’t escape tobacco; you have to change your environment”: Perceived barriers to and recommendations for cessation among polytobacco using urban young adults in Baltimore, Maryland. Daisy Le¹, Gypsyamber D’Souza², Rebekha Atnafou³, Meghan B. Moran⁴. ¹George Washington University, School of Nursing, Policy, Populations and Systems Community, Washington, DC, USA, ²Johns Hopkins University, Bloomberg School of Public Health: Dept. of Epidemiology, Baltimore, MD, USA, ³Johns Hopkins University: Urban Health Institute, Baltimore, MD, USA, ⁴Johns Hopkins University, Bloomberg School of Public Health: Dept. of Health, Behavior & Society, Baltimore, MD, USA.

Background/Purpose: Polyuse of tobacco products is increasing among urban young adults. Understanding different use profiles and the obstacles that this population faces in an attempt to quit smoking is important to inform effective cessation programs. We explored perceived barriers to tobacco cessation and recommendations for/ interest in cessation programs among urban young adult polytobacco users. Methods/Approach: 17 focus groups were conducted among 97 tobacco users between the ages of 18 and 26 from Baltimore, Maryland. Qualitative data were

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analyzed using framework analysis. Results/Findings: All participants reported a history of tobacco product polyuse, and 85% reported polyuse in the past 30 days. Several barriers to tobacco cessation emerged, including: influence of social network, easy access, source of stress relief (anxiety management), belief in self-control (ability to stop on own if desired), and boredom. Most participants reported little interest in or success with standard pamphlet-based and in-person cessation programs, but did view mobile-based cessation programs favorably. Discussions suggested that the ideal program would be quick, interactive, and would provide tailored prompts along the way, delivering cues to action. Conclusions/Significance: Given the higher prevalence of polyuse in comparison to single use for this population, tobacco cessation interventions targeting urban young adults may need to account for polyuse of tobacco. Results from this study indicate that this population faces multiple barriers to cessation, but that there is interest in utilizing mobile-based interventions and social media for cessation attempts, ultimately allowing them to manage cessation in their own time, and is more fitting of their lifestyle.

A014 Rural-urban differences e-cigarette ever use, the perception of harm, and e-cigarette information-seeking behaviors among U.S. adults in a nationally representative study. Marquita W. Lewis-Thames¹, Marvin E. L. Washington University in St. Louis School of Medicine¹, Lindsay Fuzzella. Washi Washington², Saira Khan¹, Justin X. Moore¹, Yunan Han¹. ¹Washington University in St. Louis School of Medicine, Saint Louis, MO, USA, ²Washi Washington University in St. Louis School of Medicine, Saint Louis, MO, USA.

Rural adults are more likely to use some tobacco products and die from tobacco-related diseases than their urban counterparts. The harms and benefits of e-cigarette use are mixed, and similarly, obscure messaging about these harms and benefits have a critical influence on e-cigarette uptake and perceived harms. However, little is known about rural-urban differences in the prevalence of adult e-cigarette daily usage. Using the Health Information National Trends Survey-Food and Drug Administration (HINTS-FDA) cycles 1 and 2, we conducted weighted logistic regressions to assess rural-urban differences in the prevalence of adult e-cigarette daily usage, perceived harm, and e-cigarette information seeking behaviors. This analysis included adults aged 18 and older in the United States. (N=4229). Both rural and urban respondents had a similar history of e-cigarette use. Rural respondents were significantly more likely than urban respondents to trust religious organizations and leaders

and tobacco companies for information about e-cigarettes. Rural and urban respondents were equally as likely to believe e-cigarettes are addictive, perceive e-cigarette use as harmful, and believe e-cigarettes are more harmful than smoking cigarettes. They were equally as likely to look for information on e-cigarettes, the health effects of e-cigarettes, and cessation; and, to seek e-cigarette information from healthcare professionals, family and friends, and health organizations and groups. Given our findings, it will be pertinent to continue to research the potential harms of e-cigarette use and develop accurate health communication messages to avoid similar rural-urban disparities observed for cigarette smoking-related outcomes.

A015 Post-treatment patient-provider communication and follow-up care: Does written patient-provider communication improve timely follow-up care for rural cancer survivors? Marquita W. Lewis-Thames¹, Leslie R. Carnahan², Aimee S. James¹, Karriem S. Watson³, Yamilé Molina³. ¹a. Washington University in St. Louis School of Medicine, Saint Louis, MO, USA, ²University of Illinois at Chicago, Chicago, IL, USA, ³University of Illinois at Chicago, Chicago, IL, USA.

Purpose: Patient-provider communication is a facilitator for optimizing cancer survivorship care planning. As disparities in rural-urban survivorship rates continue to widen, patient-provider communication regarding post-treatment survivorship care is a potential mechanism to improve survivorship-related outcomes. The current study examines sociodemographic and health predictors of post-treatment patient-provider communication and follow-up care, and associations between written communication and timely follow-up care for rural cancer survivors. Methods: Data was analyzed from post-treatment cancer survivor respondents of the Illinois Rural Cancer Assessment Study. The current study tested associations between sociodemographic variables and health factors on the quality of patient-provider communication and timely post-treatment follow-up care, defined as visits within three months or less of final treatment, and associations between the receipt of written patient-provider communication on timely post-treatment follow-up care. Results: Among 90 rural cancer survivors, respondents with annual incomes less than \$50,000 and having a high school diploma or less were more likely to report a high quality of post-treatment patient-provider communication. Post-treatment written communication was reported by 62% of the respondents and 52% reported timely follow-up visits during the first three years of post-treatment care. Patients who reported receiving written patient-

provider communication were five times more likely to have timely post-treatment follow-up care after completing active treatment than patients who had not received written patient-provider communication. Conclusions: For rural cancer survivors, written patient-provider communication improved timely follow-up care. This research supports policy and practice that recommends the receipt of a written survivorship care plans. Implementation of written survivorship care recommendations improves timely follow-up visits and has the potential to eliminate cancer survivorship disparities.

A016 Race, place, and smoking in rural America across four categories of an urban/rural continuum: Evidence from the Health Information National Trends Survey (HINTS). [Gilberto Lopez](#)¹, Heather Mattie². ¹University of Rochester Medical Center, Rochester, NY, USA, ²Harvard T.H. Chan School of Public Health, Boston, MA, USA.

Introduction. Although smoking prevalence has declined over the past decade, it is still associated with many types of cancer and is the leading cause of lung cancer. Rural populations are especially at risk as they have been consistently more likely to smoke. However, most research has ignored the marked heterogeneity of rural America, focusing solely on a rural/urban dichotomy. Methods. Using Rural-Urban Commuting Area Codes (RUCAs) from the 2018 Health Information National Trends Survey (HINTS-5) database (n=5,099), we analyze the odds of smoking across four contexts: urban, large-rural, small-rural, and isolated-rural areas. Additionally, we test the interaction of race/ethnicity and rurality on smoking. This gives us a potentially more detailed understanding of the relationship between race, place, and health across the urban-rural continuum. Using an established social determinants framework, a series of logistic regression models were fitted to estimate odds ratios (OR) and 95% confidence intervals (CIs) for smoking. Results. We found that those living in a small rural town had 2.16 times the odds of smoking, compared to those living in an urban area (p<0.001). Additionally, non-Whites living in isolated rural areas had significantly lower odds of smoking (OR 0.03) compared to Whites in isolated rural areas (p<0.05). Conclusions. Place and race matter for health. These findings have implications for the allocation of resources and the design of interventions aimed at smoking cessation in rural America. Such interventions should take into account the nuances of rurality, and race, in order to create culturally appropriate programming.

A017 Cancer information seeking across four categories of an urban/rural continuum: The intersection of place, race, and health information in rural America. [Gilberto Lopez](#)¹, Heather Mattie². ¹University of Rochester Medical Center, Rochester, NY, USA, ²Harvard T.H. Chan School of Public Health, Boston, MA, USA.

Introduction. Cancer is the second leading cause of death in the United States. Despite decreases in cancer mortality overall, rural populations continue to have higher prevalence and slower reduction of cancer death rates. As a preventive approach to combat cancer, the National Cancer Institute continues to prioritize providing the public with health information. Yet, little is known about cancer information-seeking across rural America and even less about its ethnic/racial distribution. Methods. Using Rural-Urban Commuting Area Codes (RUCAs), from the 2018 Health Information National Trends Survey (HINTS-5) Cycle 2 database we analyze the odds of looking for information about cancer across four geo-political contexts (n=2,625): urban, large-rural, small-rural, and isolated-rural areas, thus giving us a potentially more detailed understanding of place and health across the urban-rural continuum. We test for the interaction of race and rurality to see if the association between RUCAs and health seeking differs for Whites and non-Whites. Using an established social determinants framework, a series of logistic regression models were fitted to estimate odds ratios (OR) and 95% confidence intervals (CIs). Results. Across all models, those living in isolated rural areas had approximately 0.4 times the odds of seeking cancer information compared to urban-dwellers (p<0.05). Interestingly, this association is worse for ethnic minorities as the odds drops to 0.11 for non-Whites in isolated rural areas compared to Whites living in isolated rural areas. Conclusions. In this study, compared to urban-dwellers, those living in isolated rural areas have lower odds of seeking cancer information. This relationship was worse for ethnic minorities. Understanding this relationship between place and health has implication for the allocation of resources and the design of interventions aimed at increasing information about cancer.

A018 Using qualitative methods to develop health messages aimed to reduce secondhand smoke exposure among African American breast cancer survivors in a rural state. [Nakita Lovelady](#), Pebbles Fagan, Camille Hart, Michael Preston, Tiffany Haynes, Ronda Henry-Tillman. University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA.

Purpose. This study aimed to develop health messages that help African American breast cancer survivors reduce exposure to secondhand smoke in the home. African

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American women are disproportionately impacted by tobacco exposures and cancer mortality. Cigarette smoking decreases functional status (e.g., fatigue, pain) and increases complications related to breast reconstruction and the risk for secondary cancers. Understanding knowledge, attitudes, and beliefs related to tobacco and sociocultural and environmental influences may inform the development of messages that protect breast cancer survivors from the harm of smoke. Methods. We used a sequential design to conduct semi-structured interviews, photovoice interviews, and focus groups that informed message development related to secondhand smoke exposure. African American women breast cancer survivors aged 30-65 years, who smoked cigarettes or cigars in past 30 days or lived with a smoker, and were low income were invited to participate. Interviews assessed knowledge related to breast reconstruction and the prevention of secondary cancers; perceived susceptibility and severity related to the harms of tobacco; subjective norms; attitudes toward using tobacco and implementing smokefree home rules; perceived benefits and complexity of implementing smokefree home rules; and intentions to adopt smokefree home rules. Participants who completed the interviews (n=12) were invited to use photovoice to capture the socio-environmental context of survivorship and women's motivations for making changes in tobacco exposure (n=9). Data from the interviews and photovoice were used to develop 16 messages related to secondhand smoke exposure. An iterative process was used to obtain feedback on each message (e.g., The smoke from cigarettes, pipes, and cigars of any kind is the same. Keep your home safe from secondhand smoke) from focus group participants (n=12). Results. Forty percent of African American women breast cancer survivors who completed the interviews reported current smoking and 54% had expired CO levels > 7 ppm. Most women felt that cigarettes cause some harm, but also stated that no one knows how each person is affected. Some women felt that occasional smoking was not harmful, that secondhand smoke was as bad as smoking, and that it is a gamble as to whether anything would happen if exposed to tobacco smoke. Some women expressed that smoking did not affect their breast reconstruction surgery while others felt that it slowed the healing process, or were unclear about its effects on surgery. Women who provided feedback on the messages during focus groups stated that people say secondhand smoke causes cancer, but they were unclear of its effects. Women felt that health messages needed to convey the type of cancers caused by secondhand smoke. Conclusions. Our study provided helpful information that informed the development of messages that can be used to increase awareness of the harms of secondhand smoke.

A019 Substance use in uninsured cancer survivors from free clinics. Madeline MacDonald¹, Shreni Shah¹, Justin Swanson², Ethan Song¹, Rahul Mhaskar³, Smitha Pabbathi⁴, Abu-Sayeeff Mirza³. ¹University of South Florida Morsani College of Medicine, Tampa, Florida, U.S.A., ²University of South Florida College of Public Health, Tampa, Florida, U.S.A., ³University of South Florida Department of Internal Medicine, Tampa, Florida, U.S.A., ⁴Moffitt Cancer Center Department of Internal Medicine, Tampa, Florida, U.S.A..

Introduction: Approximately 8% of Americans suffer from alcoholism and roughly one-third of Americans endorse illicit drug use. Compared to the general population, substance abuse disorders only occur within 5% of the cancer population. Among cancer survivors, the use of alcohol was comparable to non-cancer survivors while the use of tobacco and illicit drugs was lower. Substance use can decrease treatment adherence, impede pain management, and undermine their network of social support. Our study aims to document the prevalence of substance use in uninsured cancer survivors. Methods: A retrospective chart review was conducted to manually collect chronic disease parameters from electronic medical records and paper charts at 9 free clinics in the Tampa Bay Area of Florida. Data was abstracted using a questionnaire on Redcap software. There were 222 patients with a documented history of cancer in the study and 6,768 patients with a documented negative history of cancer. Demographics were compared between cancer survivors and patients without reported cancer history using chi-square test or independent samples t-test using an alpha of 0.05 for all tests. Results: The majority of the cancer patients were female, n=146 (66.1%). Survivors were significantly older than patients without cancer 54.1 (SD=12) vs. 41 (SD=16.7), p<0.001. Cancer survivors were largely of Caucasian race (n=79, 44.1%) and Hispanic ethnicity (n=79, 44.1%). Patients with a reported cancer history were significantly less likely to be African American (n=6, 3.4%) compared to patients without a history of cancer (n=696, 14.1%) p<0.001. There was no significant difference in current or past drug use between two groups. Cancer survivors were more likely to be current smokers (n=43, 25.6%) compared to patients without cancer history (n=763, 16.1%), p<0.001. Cancer survivors were more likely to be past smokers (n=34, 20.2%) compared to patients without cancer history (n=472, 9.9%), p<0.001. Patients with a history of cancer were more likely to be current drinkers (n=34, 26%) compared to patients without a cancer diagnosis in the study (n=942, 22.9%), p=0.003. Cancer survivors were also more likely to report a history of drinking (n=13, 9.9%) than patients without a history of cancer (n=139, 3.4%), p=0.003. Conclusions: Although current literature demonstrates substance use is

associated with socioeconomic disparity, there is limited research on the prevalence of alcohol, tobacco, and illicit drug use among uninsured cancer survivors in the United States. Our study finds that uninsured cancer survivors are more likely to be current and past alcohol users but are just as likely to use illicit substances as uninsured patients without a history of cancer. Our study suggests survivors continue to be at risk for tobacco and alcohol use. More research is needed to evaluate substance use among uninsured cancer survivors.

A020 Connection to Health for Smokers: A comprehensive smoking cessation program for community health centers.

Michael B Potter, Vicky Bowyer, Janice Y Tsoh, Jose Parra, Danielle Hessler. UCSF School of Medicine, San Francisco, CA, USA.

Background: California's 1200 community health centers (CHCs) provide primary care to 1 in 7 Californians, a disproportionate number of whom are tobacco smokers, low income, and medically vulnerable due to adverse social environments, other adverse health-related behaviors, and co-occurring health conditions. Thus, CHCs are an important setting for interventions to address tobacco-smoking disparities, despite their often-limited resources to do so. The goal of this research is to develop, implement, and evaluate the feasibility and acceptability of Connection to Health for Smokers (CTHS), a new theory- and evidence-based program supported by online tools, for use by CHC-based health educators to systematically engage CHC patients to quit smoking. Methods: We developed CTHS using a participatory approach in collaboration with smoking cessation experts, behavioral scientists, CHC primary care providers and health workers, and pilot tested the intervention with patients at three sites in Contra Costa County. Results: CTHS incorporates a novel theoretical framework that includes 1) the 5A's (ask, advise, assess, assist, and arrange); 2) evidence-based principles of priority setting and action-planning; 3) direct support to patients for implementing tailored strategies to prepare for quitting and to prevent relapse; 4) indirect support for smoking cessation by managing other social and behavioral barriers (e.g., depression, housing instability or homelessness, substance use) either before or during the smoking cessation process, and (5) provide a structure and prompts for arranged follow-up and automated support between appointments. CTHS conducts an online patient assessment, guides health educators and patients to collaboratively develop a tailored action plan, and delivers automated text reminders to assist patients with action plan implementation. The program

design accounts for CHC clinic flow, allowing enrollment through primary care referrals or outreach using clinic-based smoker registries. To date, CTHS has been implemented in three clinical sites by 10 health educators working with 44 smokers, aged 21 to 68 years, of whom 43% self-identified, 43% self-identified as male, and 82% reported being daily smokers. Using CTHS, 32 (73%) patients developed action plans to quit smoking, 10 (23%) developed plans to cut down, and 2 (4%) chose to work on other health issues in preparation for quitting smoking in the future. Conclusion: CTHS is a novel smoking cessation program for patients served by CHCs that is feasible and acceptable to clinic teams and their patients who smoke. Further evaluation of program efficacy through a randomized clinical trial is both warranted and ongoing. Trial registration: NCT03680599.

A021 Tobacco and e-cigarette use in a sample of young men 18-24 in Mayagüez, Puerto Rico: The Youth Prevention Program. Nashaly M Saldaña-Santiago¹, Jorge Rodríguez-Lebrón¹, Yara Sánchez-Cabrera¹, Edna Acosta-Pérez², Vivian Colón-López¹. ¹Comprehensive Cancer Center at UPR, San Juan, Puerto Rico, USA, ²University of Puerto Rico Medical Science Campus, San Juan, Puerto Rico, USA.

Background: Smoking is the number one preventable cause of death in the world. In Puerto Rico, 11.3% of the general population reported being current smokers. The majority are men who started smoking at a young age. In addition to cigarette smoking, it is important to monitor the new and potentially dangerous trend of e-cigarette use, which has doubled ever since 2014. This study aimed to determine the prevalence and patterns of current cigarette and lifetime e-cigarette use in a sample of young men 18-24 years old from the Youth Prevention Program (YPREV). Methods: A cross-sectional study among 318 young men was implemented in 2017. Bivariate analysis comparing cigarette and e-cigarette use by selected characteristics were conducted. Results: More than half of the participants reported having smoked cigarettes during the last 30 days. Approximately 39.3% of the participants reported the use of e-cigarette in their lifetime, with 76.9% of the participants indicating trying e-cigarettes for the first time after starting college. When exploring the association between selected characteristics and current cigarette smoking, participants who reported low perceived risk of HIV infection are more likely to smoke cigarettes (p-value >0.01). In relation to e-cigarette, participants who reported being employed were more likely to use e-cigarettes (p-value=0.012). Moreover, participants who belong to the minority serving institution, reported less use of cigarettes and e-cigarettes ever than

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those part of the community. Conclusions: As YPREV aimed to expand their prevention services to young men in the Western region of Puerto Rico, strategic alliances for the development of multidisciplinary interventions for cigarette and e-cigarette use will be necessary, which will help develop targeted prevention strategies, primarily among freshmen college students in the Western region of Puerto Rico.

A022 “Let me smoke that”: Exploring combustible tobacco use and smoking cessation behavior among sexual minority young adult smokers in Washington, D.C. Sabrina L Smiley. University of Southern California, Los Angeles, CA, USA.

Background: In the U.S., lesbian, gay, bisexual, and transgender individuals (LGBT) are medically underserved, understudied, and are often difficult for researchers to access due in part to risks to participation (i.e., discrimination and stigma). While evidence regarding combustible tobacco use among LGBT adults is relatively underdeveloped, significant health disparities exist in this population. LGBT young adults in particular are nearly twice as likely to use tobacco compared to their heterosexual and cisgender counterparts, indicating that LGBT smokers have higher rates of tobacco-related cancers, including lung cancer. Informed by the Theory of Planned Behavior, this qualitative pilot study explored in depth attitudes, subjective norms, and perceived behavioral control toward combustible tobacco product use and cessation behaviors among a sample of young adult LGB smokers residing in Washington, D.C. Methods: Semistructured face-to-face interviews were conducted with self-identified lesbian (n=1), gay (n=5), and bisexual (n=2) young adult smokers. Interviews were audio-recorded, transcribed, and analyzed using thematic analysis methodology. Digital audio recordings of the interviews were transcribed verbatim and edited to remove identifiers. Results: Participants ranged in age from 18 to 25 (M = 23.25, SD = 2.05). Five participants identified as African American and four identified as male. Three participants reported part-time employment and four reported that they “don’t meet basic expenses”. The mean age for cigarette smoking onset was 15.6. All participants reported menthol cigarette preference, four reported daily menthol cigarette use, and five reported past 30-day little cigar/cigarillo use. Attitudes, subjective norms, and perceived behavioral control toward combustible tobacco use and cessation behaviors fell under the broad themes of individual-level factors (self-image), psychosocial factors (stress and anxiety), socio-cultural factors (pro-smoking social norms), and stage of readiness. Intention to quit smoking in the next six months was low and influenced by pro-smoking attitudes and behaviors in

the social environment surrounding LGBT young adults. Conclusions: Study findings contribute to a limited body of research investigating theoretically grounded variables related to combustible tobacco use among sexual minority young adult smokers. Multilevel cessation interventions are needed to address the psychosocial, socioeconomic, and cultural underpinnings of combustible tobacco use by distinct sexual identity. Additionally, study findings suggest opportunities to inform prevention campaigns like “This Free Life,” the Food and Drug Administration’s public education campaign designed to prevent and reduce tobacco use among LGBT young adults.

A023 Do African American informal caregivers’ breast cancer fear and cultural misconceptions predict the spread of breast cancer misinformation among their social networks? Nyahne Q Bergeron, Mona Strahan, Shaila Strayhorn, Aditya Khanna, Dana Villines, Karriem Watson, Carol Ferrans, Yamile Molina. University of Illinois at Chicago, Chicago, IL, USA.

Introduction: African American women experience a disproportionate burden of breast cancer morbidity and mortality. Members of African American breast cancer survivors’ social networks often act as informal caregivers, offering psychosocial support, sharing important information, and assisting with treatment adherence. They may thus serve as opinion leaders within their own social networks, especially if they are also women and are within the recommended age for breast cancer screening. Nonetheless, informal caregivers are not formally trained and may be vulnerable to cultural misconceptions and higher levels of fear through their firsthand experiences as caregivers. Understanding the relationship between breast cancer cultural misconceptions, fear and the spread of misinformation among the social networks is crucial; yet, little research has been done in this area. Methods: This is a secondary analysis of the Offering African Survivors Increased Support (OASIS) study, which assesses African American breast cancer survivors’ experiences with cancer care. To be eligible, participants had to be: 1) identified as a support person by a survivor; 2) female; and, 3) 50-74 years old. We used the validated Ferrans Cultural Beliefs and Champion Breast Cancer Fear scales to quantify cultural misconceptions and fear retrospectively. For social network dissemination, we used a modified Burt’s General Social Survey instrument and coded open-ended fields regarding communication between caregivers and up to 5 network caregivers. Results: 30 informal caregivers were surveyed. Sixty percent reported at least one cultural misconception,

the most common misconception being “If breast cancer is cut open in surgery, it will grow faster.” Approximately 33% further disseminated cultural misconceptions to 2 or more people within their networks. After adjusting for education, our multivariable linear regression suggested that informal caregivers who report greater breast cancer fear (Std B = 0.46, p = .008) and more misconceptions (Std B = 0.44, p = .02) disseminated cultural misconceptions to more people within their network. Conclusion: Informal caregivers that reported greater misconceptions and fear related to breast cancer were significantly more likely to share breast cancer misinformation to their social networks. These results show the value of initiatives in clinical and community settings that address these misconceptions and support increased breast cancer screening. Future research will assess the specific recipients of miscommunication (e.g., family, friends) and how this miscommunication is associated with the likelihood of obtaining breast cancer screening among their networks.

A024 Preventing PROGRESSION. [Annie Delores Feehan](#). Independent Advocate, San Francisco, CA, USA.

Immunotherapy and liquid biopsies for colorectal cancer patients will be changing treatment decisions in the coming years. But, as it is, those who are patients in community and rural settings, do not have access to the same information as those who are at NIH centers. This is particularly true for Stage 1, 2 and even Stage 3 patients who tend to get treatment at a localized center.

Outreach to this group must be either community-based or social media-based. This project is to create a Facebook group for early stage colorectal cancer patients so that they know about clinical trials and new technologies available to them.

Many of the online Facebook communities have a strong presence of stage IV patients, care-partners and family members. But there aren't any active research-focused groups that focus on the concerns of stage 1, 2 or 3 patients. Fifty percent of those with stage IV disease started as a stage 1, 2 or 3 patients. So, this is an important area of interest as well as a key area of prevention. Helping to prevent progression may be possible in this population and may be more likely with the advent of immunotherapy and liquid biopsies.

Three Arms to the Facebook group.

1. Information about Immunotherapy options for Stage III patients
 - Immunotherapy for MSI patients (about 10% of Stage III CRC patients) is available in a number of trials. One

of them, the ATOMIC trial was at about 15% enrollment as of last January. There is some compelling research that immunotherapy may be more effective than chemotherapy for this population (which has FDA approval of I/O as a 2nd line treatment in the metastatic setting)

2. Liquid biopsy and related clinical trial options.

- For Stage III will be tested in clinical trial NCT03803553 starting in the fall of 2019. If circulating cancer DNA is found, patients are believed to be at higher risk for recurrence. These patients will have the ability to choose to have more chemotherapy (e.g. 6 months instead of 3 months).
- Stage II patients can enroll in the COBRA trial (expected December 2019 to January 2020) so that the presence of ctDNA can be monitored. If it is found, those patients can choose to have chemotherapy (which is usually only offered for high-risk” Stage II patients).
- About 20% of Stage II patients will progress to metastatic disease and 28% of Stage III will have progression.
- Liquid biopsies for colorectal cancer patients will be changing treatment decisions in the coming years. The presence of circulating tumor DNA is a sign that treatment has not been effective and that progression of disease to a metastatic setting is more likely.

3. To be a clearing house of other clinical trial information to have a “value added” feature that could appeal to a wide range of Stage II and III patients who are looking for vetted current research

- Observational trials and registries e.g. looking at mutations, gut microbiome
- Registries and trials for heredity colorectal cancers e.g. Lynch Syndrome
- Intervention trials -such as changing diet and/or increasing exercise
- Intervention trials for those who are Stage III but are unresectable
- Upcoming interventional trials in the adjuvant setting (this may happen in 2020/2021 for BRAF V600e patients who have one of the most aggressive cancers in the metastatic colorectal cancer)
- Results from trials that may be of use to Stage II and III patients (e.g. survivorship plans, side effects like neuropathy and supportive care)
- Information on how to enroll or search for a clinical trial

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A025 Sociodemographic patterns of health-related internet use among adults in the United States: A HINTS analysis. Marlene Camacho-Rivera, Rose Calixte. CUNY School of Medicine, New York, NY, USA.

Background: National surveys of U.S. adults have documented significant increases in health-related internet use (HRIU), but there are documented disparities by race/ethnicity, SES, age, gender, urbanicity. Objective: The study aims to identify social and demographic patterns of HRIU among U.S. adults. Methods: Using data from the Health Information National Trends Survey (HINTS) 4 cycle 3 and HINTS 5 cycle 2, we examined HRIU across 3 domains: healthcare use, health information seeking for oneself or someone else, and user generated content and participation on social media for health reasons. Primary predictors of interest were gender, race/ethnicity, age, education, income, and nativity with adjustments for smoking, health insurance and access, and survey year. We used multivariable logistic regression with survey weights to identify independent predictors of HRIU. Results: Of the 4,817 respondents, 43% had used the internet to find a doctor, 80% had looked online for health information for themselves. Only 20% had visited a social media site for a health issue; 7% participated in an online health support group. In multivariable models, older and low SES participants were significantly less likely to use the internet to look for a provider, use the internet to look for health information for themselves or someone else, and less likely to use social media for health issues. No racial disparities in healthcare communication or health information seeking were observed. Conclusions: Use of HRIU is vast, but varies significantly by demographics and intended use. Implications for tailoring health messages around modality accessibility should be considered.

A026 Effects of values-based messaging and an ecological approach to communicate about sugar as a strategy to prevent cancer among Latinas. Deepti Chittamuru, Susana Ramirez. University of California Merced, Merced, CA, USA.

Introduction: An important aspect of Latino cancer prevention is reducing consumption of the sugar sweetened beverages (SSB) that account for many of the excess calories consumed and contribute to high rates of diabetes, obesity and other cancer risks. SSB consumption is powerfully influenced by social context, including targeted advertising and marketing, yet health promotion approaches focus on individual behavior, ignoring the social determinants of health (SDOH). Social justice based empowerment approaches suggest that literacy empowers people both to make better individual behavioral choices and to engage in activities that

result in improved health for the overall community. Such approaches lend themselves to messaging about SDOH consistent with an ecological approach to health. Moreover, recent research in cancer communication has suggested that values-based appeals may increase receptivity to and engagement with messages, which then improve literacy and empowerment. This approach may be particularly useful for addressing disparities populations like Latinos. Aim: We tested the efficacy of messages about SDOH that invoke the values of social justice, standing up to exploitative authority, and familism, three values held strongly by young adult Latinos. We hypothesized that values-based SDOH messages would be more effective than traditional fear-based individual messaging.

Methods: An unbalanced experimental design with Mexican-American women aged 18-29 (N=434). Control condition (N=73): A typical fear-based appeal on the individual harms of obesity. Experimental condition (N=361): 5 distinct values-based messages on the social determinants of obesity and diabetes. Main Outcomes: Receptivity to and acceptance of the messages. Secondary Outcomes: Public health literacy, SSB media literacy, empowerment. Analyses: Simple and multiple linear regression models accounting for the unbalanced design.

Results: Consistent with hypotheses, the values-based messages communicating an ecological model of public health were more effective than the traditional fear appeal individual behavior message: Participants were more receptive to ($p < .001$) and accepting of ($p < .01$) values-based messages relative to control. Values-based messages increased SSB media literacy ($p < .05$) and the perceived efficacy of civic actions such as boycotting SSB ($p < .05$) and using social media to advocate about SDOH and sugar ($p < .001$). Values-based messages appear to work by engendering identification ($p < .001$) and activating social justice values ($p < .05$).

Conclusion: Values-based messages about the individual harms and social causes of SSB overconsumption resonate more than the traditional health communication approach among young adult Latinas who are at increased risk of diet-related cancer. An ecological approach to cancer communication incorporating SDOH and individual behavior holds considerable promise for addressing cancer disparities among Latinos.

A027 Myths and traditions in the African American community. Loretta Herring. Cancer Awareness Network for Children, Inc., Adamsville, AL, USA.

The poster will display the trends and traditions that have hindered the growth of knowledge in the African Americans Communities, dealing with the diagnoses of cancer, research participation, and clinical studies. Myths, misconceptions and mistrust dealing with health disparities.

A028 Perceptions of the nursing role in cancer survivorship among aging African American cancer survivors and caregivers. Sharon Cobb¹, Ebere Ume². ¹Charles R. Drew University of Medicine & Science, Los Angeles, CA, USA, ²University of St. Francis, Joliet, IL, USA.

Introduction: Oncology nurses are recognized globally for enhancing health outcomes, improving care coordination, and providing quality care. However, few studies have addressed the role expectations of a nurse among underserved cancer survivors and caregivers (CSCs), especially those who belong to a minority group. The purpose of this study was to explore the role expectations of nurses among aging African American cancer survivors and caregivers. Methods: A qualitative approach was utilized, using purposeful and theoretical sampling. Semi-structured qualitative interviews were conducted with 40 aging and community-dwelling African American cancer survivors and caregivers. Data was analyzed using a descriptive approach and thematic content analysis. Results: The results suggest that nurses should have a greater awareness of life events and challenges that can affect cancer survivorship, such as body image issues, financial hardship, and low social support. The following three themes that emerged that describe the perception of the nursing role and minority CSCs include: (1) adequate health education and nursing skill demonstration related to CSC, (2) increased advocacy for the underserved cancer survivors and caregivers, including resource identification and sharing, and (3) assessment and management of the biopsychosocial needs of CSCs. Implications: The role of nurses in these communities managing cancer survivorship among both survivors and caregivers is critical as these specific populations may have unique care needs. The results can be used to inform the development of culturally relevant and nursing-led interventions targeted towards CSCs to improve the cancer survivorship experience for aging minority populations.

A029 Health information seeking among non-Hispanics, U.S.-born Hispanics, and foreign-born Hispanics, United States, 2017-2018. Betsy Escobar¹, Trisha Amboree², Maria Jibaja-Weiss¹, Jane Montealegre¹. ¹Dan L Duncan Comprehensive Cancer Center at Baylor College of Medicine, Houston, TX, USA, ²The University of Texas School of Public Health, Houston, TX, USA.

Introduction: Hispanics are the largest and fastest growing minority in the U.S. Compared to non-Hispanics (NH), they are likely to encounter barriers to achieve optimal health based on language, education, and literacy levels, access to care and lack of health insurance. Foreign-born Hispanics (FBH), in particular, are more likely than U.S-born Hispanics (USH) to experience these barriers. We examined health-seeking information behaviors among non-Hispanics (NH), U.S. born Hispanics (USH), and Foreign-born Hispanics (FBH). Methods: We analyzed data from the Health Information National Trends Survey (HINTS) 5 cycle 1 (2017) and cycle 2 (2018). HINTS is a nationally representative cross-sectional sample of health media use and cancer-related knowledge among U.S. adults. Using SAS Version 9.4, we conducted Wald Chi-Square tests to attain descriptive statistics. We performed a multivariate logistic regression to assess the association between the primary outcome – health-seeking information, and the primary predictors – Hispanic ethnicity and nativity while controlling for sociodemographic factors. Results: The majority of FBH (92.57%) had been in the U.S. for more than 10 years. A higher percentage of FBH (31.21%) had less than a high school education when compared to USH (7.76%) and NH (6.8%). Compared to NH (82.32%), a lower percentage of both FBH (62.95%) and USH (77.62%) sought health information ($p < 0.0001$). However, a higher percentage of FBH (23.05%) sought health information from their doctor or health care provider compared to USH (13%) and NH (12.24%) a lower proportion of FBH (68.45%) used the internet to seek health information compared to USH (77.22%) and NH (77.23%). Similarly, a lower proportion of FBH (59.03%) reported using an electronic device to seek health information for themselves compared to USH (70.71%) and NH (73.59%). In multivariable analyses, FBH had 48% lower odds of seeking health information (odds ratio = 0.52, confidence interval = 0.33 – 0.84) compared to NH after adjusting for sociodemographic factors. Additionally, being female, having some college education or higher, and household income of \$20K-\$75K+ were significantly associated with seeking health information ($p < 0.0001$). Conclusion: We found dramatic differences in the prevalence of health information seeking across groups, with an almost 15% lower prevalence among FBH when compared to USH, and approximately 5% lower prevalence among USH when

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compared to NH. Specifically, FBH were more likely to seek health information from their health care provider than by electronic devices or the internet compared to USH. Given that FBH are less likely to have a usual healthcare provider and access healthcare regularly, this may make them less likely to receive health information. Differences in health information seeking practices should be considered, and health information campaigns tailored to specific subgroups within the Hispanic population.

A030 Human papilloma virus awareness among non-Hispanics, U.S.-born Hispanics, and foreign-born Hispanics, United States, 2017-2018. Betsy Escobar¹, Trisha Amboree², Maria Jibaja-Weiss¹, Jane Montealegre¹. ¹Dan L Duncan Comprehensive Cancer Center at Baylor College of Medicine, Houston, TX, USA, ²The University of Texas School of Public Health, Houston, TX, USA.

Introduction: Hispanics are the largest and fastest growing minority in the U.S. Knowledge of Human Papilloma Virus (HPV), and the HPV vaccine is reportedly lower among Hispanics compared to non-Hispanic whites. However, the Hispanic population is not homogenous, and there may be significant differences among subpopulations (e.g., by country/region of origin). We examined HPV knowledge and awareness among non-Hispanics (NH), U.S. born Hispanics (USH), and Foreign-born Hispanics (FBH). Methods: We analyzed data from the Health Information National Trends Survey (HINTS) 5 cycle 1 (2017) and cycle 2 (2018). HINTS is a nationally representative cross-sectional sample of health media use and cancer-related knowledge among U.S. adults. Using SAS Version 9.4, we conducted Wald Chi-Square tests to attain descriptive statistics. We performed a multivariate logistic regression to assess the association between two parallel outcomes – (1) heard about HPV and (2) heard of the HPV vaccine, and the primary predictors – Hispanic ethnicity and nativity while controlling for sociodemographic factors. Results: The majority of FBH (92.57%) had been in the U.S. for more than 10 years. A higher proportion of both FBH (68.75%) and USH (67.17%) reported having an immediate family member between 9 and 27 years old compared to NH (47.39%). A lower percentage of FBH (48.61%) had heard of HPV compared to USH (67.60%) and NH (64.73%). A lower percentage of FBH (47.74%) had heard of the HPV-vaccine compared to USH (55.71%) and NH (64.48%). In multivariable analyses, FBH had 44% (odds ratio [OR] = 0.56, confidence interval [CI] = 0.36 – 0.85) lower odds of having heard of HPV and USH had 42% (OR = 0.58, CI = 0.43 – 0.78) lower odds of having heard of HPV vaccine compared to NH after adjusting for sociodemographic factors. Additionally, being

female, older in age, having some college education or higher, and household income of \$35K-49,999 or >\$75K were significantly associated with having heard of HPV and the HPV vaccine ($p < 0.0001$). Conclusion: There are differences between FBH and USH in levels of HPV awareness. Within these subgroups, a disconnect exists regarding awareness of HPV and the HPV-vaccine. FBH were more aware of HPV but not as much about the HPV-vaccine while USH were less aware of HPV but more aware of the HPV-vaccine. Overall low level of awareness of HPV and the HPV vaccine is concerning given that a large proportion of USH and FBH have a vaccine-eligible family member 9-27 years old. Strategic HPV awareness campaigns are needed to target the different subgroups among Hispanics based on their nativity status.

A031 Karmanos Cancer Institute Prostate Cancer Advocacy Program. Fred Hardy. Karmanos Cancer Institute, Detroit, MI, USA.

A multifaceted training expanding the realm and scope of the meaning of advocacy and what advocacy can be.

A033 Communication leads to cancer research and education. McKinley Walker. Karmanos Cancer Institute, Detroit, MI, USA.

Communication leads to cancer research and education.

A034 Extending the reach of genetic counseling to the safety net: Study design and recruitment challenges of a randomized trial. Claudia Guerra¹, Robin Lee¹, Susan L Stewart², Celia Kaplan¹, Galen Joseph¹, Janice Tsoh¹, Niharika Dixit¹, Heather Cedermaz³, Jin Kim⁴, Jane Campbell³, Lily X Wang³, Amal Khoury⁵, Cindy Hellman-Wyllie³, Rena J Pasick¹. ¹UCSF, San Francisco, CA, USA, ²UC Davis, Davis, CA, USA, ³Contra Costa Regional Medical Ctr, Martinez, CA, USA, ⁴Alameda County Medical Center, Oakland, CA, USA, ⁵Alameda County Medical Center, Oakland, CA, USA.

Genetic counseling (GC) for hereditary breast and ovarian cancer is available mainly in academic settings. Despite equal risk, most low income public hospital patients remain unaware and untested. Remote counseling may be a solution, but research has been limited to phone counseling for insured patients. Our study compares in-person, phone, and video conference GC among high-risk patients in 3 public hospitals to determine the comparative effectiveness of GC delivered across modes with regard to patients' knowledge,

cancer distress, decisional conflict, perceived stress, risk perception, satisfaction, and recall. We also assessed whether patients have a preference for counseling mode and how that affects outcomes. This report describes the study design and lessons learned regarding recruitment. We conducted a multicenter partially randomized preference noninferiority trial with English-, Spanish-, and Cantonese-speaking patients assigned by randomization or patients' preference to one of the three GC modes. High-risk patients were identified using a family history screener in clinics or by physician referral. Study staff verified risk by phone, invited participation, conducted informed consent, and administered a baseline survey. Enrollees were asked whether they could be randomized or if they preferred one GC mode. They were then given a GC appointment and called again within 2 weeks of counseling for a follow-up survey. Power calculations required 270 randomized patients. A total of 23,401 screener forms yielded 824 likely to be high-risk; 656 completed baseline surveys. Race/ethnic composition was 40% Latinx, 25% white, 19% African American, and 8% Asian. Of these, 531 were counseled, and 505 completed final surveys (283 from randomized patients). The majority (64%) of non-randomized patients chose counseling by phone, 33% chose in person, 3% chose video. • At every step, participation exceeded our projections, showing that diverse low-income patients were interested in participating in research that they deemed relevant. • Our greatest recruitment challenges were due more to settings than to patients. Collection of screeners varied greatly by month and/or clinic. Oncologists valued the risk services offered by the study, but intensive engagement was necessary with front-line staff/supervisors because of their job demands. • Partial randomization functioned well. Prior studies showed that many high-risk women refuse randomization for GC. Adding a preference arm necessitated a larger sample, but greater inclusiveness yields more generalizable findings. • Recruitment of Chinese-speaking patients was low (2.5%) due largely to structural barriers which we continue to explore. Practice-based safety net research presents numerous challenges that require close partnerships, extensive planning, and highly skilled staff capable of sensitive personnel engagement. The work is rewarded by real-world findings, the sine qua non in efforts to eliminate cancer disparities.

A035 The influence of patient-provider language concordance in cancer care: Results of the Hispanic Outcomes by Language Approach (HOLA) randomized trial.

Daniel M Seible, [Souma Kundu](#), Alexa Azuara, Daniel Cherry, Steven Arias, Vinit Nalawade, Jonathan Cruz, Rolando Arreola, Elena M Martinez, Jesse Nodora, Douglas A Rahn, James D Murphy. UCSD, La Jolla, CA, USA.

Purpose: Delivering linguistically competent care is critical to serving limited English proficiency patients, and represents a key national strategy to reduce health disparities. Current acceptable standards of communication with non-English speaking patients include providers communicating through professional interpretive services, or bilingual providers speaking patients' non-English languages directly. This study tests the impact of patient-provider language concordance on patient satisfaction through the conduct of a randomized clinical trial. Methods and Materials: Eighty-three adult Spanish-speaking cancer patients were randomized to receive care from either 1) a bilingual physician speaking to a patient directly in Spanish or 2) from the same physician speaking English and using a professional interpreter service. Validated questionnaires were administered to assess patient-reported satisfaction with both provider communication and overall care. Audio recordings of initial consultations with oncologists were transcribed and analyzed for content variations. Results: Compared to using professional interpretive services, patients cared for in direct Spanish reported significantly improved general satisfaction, technical quality of care, care team interpersonal manner, communication, and time spent with patient. Specific to physician communication, patients rated direct Spanish care more highly in perceived opportunity to disclose concerns, physician empathy, confidence in physician abilities, and general satisfaction with their physician. Analyzing the content of consultation encounters revealed differences between study arms, with the direct Spanish arm having more physician speech related to patient history verification and partnering activities. Additionally, patients in the direct-Spanish arm were more likely to initiate unprompted speech, and ask their providers questions. Conclusions: This study demonstrates improved patient-reported satisfaction among Spanish-speaking cancer patients cared for in direct Spanish compared to patients cared for with interpreter-based communication. Further research into interventions to mitigate this patient-provider language barrier is necessary to optimize care for this minority population.

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A036 Active patient and stakeholder engagement was critical to the success of a comparative trial to reduce liver cancer disparities for underserved Asian Americans with HBV.

Wenyue Lu¹, Yin Tan¹, Michelle Naidoo², Aliyah Saber², Ming-Chin Yeh², Grace X Ma¹. ¹Center for Asian Health, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, USA, ²Department of Biological Sciences, Hunter College, City University of New York, New York, NY, USA.

Background: Asian Americans are a liver cancer disparity population and a chronic hepatitis B (CHB) disparity population. Seventy-five percent of hepatocellular carcinoma cases are developed from CHB. Moreover, in the past decades, patient and stakeholder engagement has been an emerging infrastructure in the research process. This study aims to examine the influences of patient and stakeholder engagement, an emerging infrastructure in the research process, on reducing liver cancer disparities among underserved Asian Americans with CHB. Method: A 3-year fieldwork was conducted in a broader HBV project to observe the influences of patient and stakeholder engagement. Twenty-five patient partners/caregivers, physicians, and community advocate stakeholders were engaged through numerous regular in-person meetings and teleconferences in project conceptualization, study design, patients recruitment and retention strategies, intervention components development (message and materials review/feedback, education content review/feedback), outcome measurement assessment tools, and quality control. Moreover, the engagement experiences from patients and stakeholders were examined using the Bell-Elkins questionnaire with 25 survey forms. Results: the survey indicated that there is a unanimous agreement of partnership engagement in shared mission, goals and values, and measurable outcomes (e.g., community-campus partnership, collective decisions, effective communication, resource shared, addressed weakness, and mutual trust and respect) addressed for the study. All of the 25 patient and stakeholders agreed that the partnership shared the same goals and values, the members had mutual trust and respect and they shared varied resources. A majority of them (84%-92%) believed that the partnership had effective communication, it was a true community-clinical-academic partnership, the decisions were collectively made, and it addressed its weaknesses. The fieldwork observation showed that the patient and stakeholder engagement can improve the study quality by enhancing intervention content, offering practical suggestions, promoting recruitment and increasing the retention rate. Furthermore, the adoption of the patient-centered strategy in the HBV project has resulted in significant benefits for patients, as patients can better

manage their health when they are informed and supported. Full engagement empowered target populations to make lifestyle modifications, enhance patients' HBV monitoring and treatment, and thus reducing the risk of developing liver cancer. Conclusion: the active involvement of patient and stakeholders can significantly empower the investigators and reduce the HBV patient's liver cancer disparities among Asian Americans. In the future studies, the patient and stakeholders should be involve actively in the different stages of the project to improve the project quality, reduce cancer disparities, and improve the public health.

A037 Motivation through relational communication: Examining the normative social behavior of African American women who participate in breast cancer clinical trials.

Katherine E Ridley-Merriweather. Indiana University Purdue University Indianapolis, Indianapolis, IN, USA.

Black women die of breast cancer (BC) at a higher rate than any other racial group, but examination of the exact reasoning behind this phenomenon is hampered by African Americans' (AAs) well-documented unwillingness to participate in medical research. According to research, AAs' exhibited behavioral norms regarding clinical trial (CT) participation demonstrate a fear of being treated like guinea pigs, deep memories of previous abusive CTs, and strongly held perceptions of receiving unequal treatment in emergency departments and clinics. The Theory of Normative Social Behavior (TNSB) distinguishes descriptive norms (people's perceptions about a behavior's prevalence) from injunctive norms (people's perceptions of the acceptable attitudes and behaviors of their defined group) and describes normative outcomes as injunctive norms joined with expected outcomes and group identity, that serve to influence the effects of descriptive norms on people's behavior. Through the lens of the TSB, this study identifies the descriptive norms and normative mechanisms of Black/AA women who participate in BC CTs, and explores how their decisions to participate were guided by their relational communication practices. Thirteen self-identified Black or AA women (N=13) who are BC survivors or currently in treatment for BC, and who have previously taken part or are currently enrolled in a BC CT, participated in this study. The women answered interview questions such as, "How were you exposed to the idea of participation in a CT? What were the thoughts of your physicians/friends/family about your participation in particular? What is your experience with other AA women who have participated in BC CTs?" This study's main finding was that each of these participants demonstrated very high levels of self-advocacy

and self-efficacy, evidenced by their common admission of having made their decision on their own to take part in a CT, informing friends, family members, and physicians of their decision rather than seeking input or advice before deciding. Other results confirmed the presence of many already well-known AA descriptive norms such as distrust of CTs; however, the participants expressed feelings that generally, all African American women who have been diagnosed with BC should consider taking part in some kind of CT. Other findings were that these women showed strong racial identity, and were motivated to participate by the expectation of personal positive outcomes, monetary and non-monetary incentives, and a strong desire to help others.

A038 What about me? A content analysis of triple-negative breast cancer clinical trial inclusion eligibility criteria. [Katherine E Ridley-Merriweather](#). Indiana University Purdue University Indianapolis, Indianapolis, IN, USA.

Triple negative breast cancer (TNBC) is noticeably more prevalent in Black women than White, while women from these two groups exhibit similar incidence rates for breast cancers (BCs) that test positive for overexpression of the HER2 receptor (HER2+BC). This content analysis explores whether the available evidence and general knowledge among BC researchers of the significantly higher TNBC incidence rates by African American women than Caucasian women is reflected in the eligibility criteria inclusion language of TNBC clinical trials. Data gathered from [clinicaltrials.gov](#) was used in a comprehensive analysis on the text of the trial description and eligibility criteria inclusion language of all eligible clinical trials. Three themes resulted: 1) Similarities in TNBC/HER2+BC eligibility criteria inclusion language; 2) differences in TNBC/HER2+BC eligibility criteria inclusion language; and 3) recruitment language oversights. Four characteristics of the data sets (age requirements, prerequisite of invasive BC, previous treatment for BC, determined life expectancy period) were determined to be similar, and two characteristics (breast surgery restrictions, metastases) were identified as demonstrating a level of difference. Despite well-demonstrated evidence that TNBC measurably, significantly, and disproportionately affects women of African descent, young (particularly Latina) women, and women testing positive for BRCA mutation, there is strong evidence that these risk factors are not at all addressed in the formal inclusion language of BC CTs posted on [clinicaltrials.gov](#). The implications of this work suggest further research to ascertain whether there are efforts to recruit any of these populations independently of the site's formal listings.

A039 Health information sources among Pacific Islanders in Guam and Hawaii: The association of migrant status and acculturation with Internet use and cancer fatalism. [Lilnabeth P Somera](#)¹, Grazyna Badowski¹, Kevin Cassell², Hye-ryeon Lee². ¹University of Guam, Mangilao, GU, USA, ²University of Hawaii, Honolulu, HI, USA.

Background US Pacific Islanders (USPI) are one of the fastest growing population groups, and cancer is the leading cause of death among them. Limited knowledge about the health communication practices of USPI is a barrier to effective cancer prevention programs. Methods As a part of a special HINTS (Health Information National Trends Survey) initiative, a modified HINTS was conducted to understand health communication practices of USPI in Guam and Hawaii, including long-term residents and recent migrants from the Freely Associated States. Using respondent-driven sampling (Heckathorn, 1997) the HINTS was administered to 1,543 USPI in 2018. Measures of health information patterns, acculturation, and other variables were obtained. To examine the association between migrant status, acculturation and use of the Internet as the preferred source of health information, logistic regression analyses (adjusted for gender, age, and education) was conducted. We also examined the prevalence and correlates of cancer fatalism. Results Only 33.2% participants reported that they went to the Internet first the most recent time they looked for the information about health and medical topics. An even smaller percentage (17.3%) reported that they would seek information from Internet first in the future if they had a strong need. Data show distinctive health communication patterns and experiences among three populations (those who were born in the US, earlier migrants before 2012, and recent migrants since 2012). There is a strong association between migrant status and Internet use. Earlier and recent migrants were less likely to use the Internet first on the most recent health information search compared with those who were born in the US (OR=0.47; 95% CI: 0.33, 0.68 and OR=0.44; 95% CI: 0.22, 0.86 respectively). Also, intending to use Internet first in the future was less likely among earlier migrants (OR=0.51; 95% CI: 0.36, 0.74) and recent migrants (OR=0.37; 95% CI: 0.18, 0.77) when compared with US born respondents. There appears to be a strong association between migrant status and Internet use. Acculturation was not significantly related to Internet use. Most individuals (73.4%) indicated agreeing or strongly agreeing with the belief that everything causes cancer, and majority of respondents (55.8%) indicated agreeing or strongly agreeing that there is not much you can do to prevent cancer. This cancer fatalism was not significantly associated with migrant status. However, it was strongly associated with acculturation. Those reported

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participating often in their ethnic traditions were almost twice as likely (OR=1.9; 95% CI: 1.46, 2.46) to believe that there is not much you can do to prevent cancer when compared with those who did not participate. These findings suggest that differential levels of digital literacy and the influence of ethnic social networks and migration status could impact the efficacy of cancer prevention strategies for USPI populations.

**A040 “Don’t tell anybody I have breast cancer, they gonna tell everybody! I don’t want my business in the street”:
Patterns of secrecy regarding breast cancer among African American breast cancer survivors.** [Desmona C Strahan](#)¹, Nyahne Bergeron¹, Shaila Strayhorn¹, Aditya Khanna², Dana Villines³, Karriem S Watson¹, Yamilé Molina¹. ¹University of Illinois at Chicago, Chicago, USA, ²University of Chicago, Chicago, USA, ³Advocate Aurora Health, Chicago, USA.

Introduction: African American women suffer disproportionately from breast cancer relative to other women. One potential contributing historic and cultural factor regards a need for privacy and non-disclosure of disease experiences. This study was a first step to characterize the diffusion of personal breast cancer information throughout African American women’s social networks. **Methods:** This is a secondary analysis of the Offering African Survivors Increased Support (OASIS) study, which compares the survivorship experiences of women who were/were not navigated throughout diagnosis and treatment. To be eligible, participants had to be: 1) diagnosed within 2011-2014 at Advocate Health in Chicago, IL; 2) female; 3) 18 years or older; and, 4) African American. Trained interviewers conducted 60-90 minute interviews in participants’ homes, libraries, or office spaces, wherein they administered a modified version of Burt’s General Social Survey instrument regarding communication during breast cancer diagnosis and treatment. **Results:** Approximately 27% of our 33 participants were 50-74 years old, 39% had a bachelor’s degree or greater level of education, and 76% were retired. Overall, 157 family and friends identified as individuals with whom survivors were close during the period of diagnosis/treatment. Survivors disclosed their breast cancer diagnosis to 81% of these individuals, of which 81% were female, 31% were relatives, and 44% communicated with survivors on a daily basis. Qualitative analysis suggests: 1) disclosure was not aligned with fear of disease or a lack of self-assurance/ideology as a strong black woman; rather, disclosure was rooted in societal norms and acceptance of vulnerabilities of black women. Qualitative findings also suggested this disclosure led to a syndrome of silence and level of secrecy too difficult to unravel, fostering a lifetime of secrecy.

Conclusion: Our preliminary data have important implications regarding how rising breast cancer incidence rates and breast cancer interventions for African Americans may not necessarily result in increased community knowledge and exchange of evidence-based, personally experienced information about breast cancer. Ongoing analyses will explicitly identify family and friends who were not engaged about breast cancer and reasons for non-disclosure.

A041 Community engagement in the development of an m-health app utilizing a black male virtual health assistant (VHA) to promote colon cancer screening: An iterative study of credibility and likeability. [Danyell Wilson-Howard](#)¹, Melissa Vilaro², Lauren Griffin³, Fatemeh Travassoli³, Mohan Zalake³, Benjamin Lok³, Francois Modave⁴, Peter Carek³, Thomas George³, Janice Krieger³. ¹Bethune-Cookman University, Daytona Beach, FL, USA, ²University of Florida, Gainesville, FL, USA, ³University of Florida, Gainesville, FL, USA, ⁴Loyola University, Chicago, IL, US.

Traditionally, promotion of colorectal cancer (CRC) screening among minority and rural populations including African American men was delivered by Community Health Workers (CHW), Patient Navigators, and decision aids (printed text or video media) at clinics. A novel approach to increase CRC screening of black men includes developing and utilizing a patient-centered, tailored message delivered via mobile-health (m-health) technology. In this study, a Community Based Participatory Research (CBPR) approach provided feedback on a Virtual Health Assistant (VHA) designed to deliver precision and personalized messages promoting the Fecal Immunochemical Test (FIT) for CRC screening. Focus groups of Black men were recruited to understand and employ their perceptions of a Black-male VHA. Specifically, these men identified source characteristics that would enhance the credibility of the VHA and likeability of an m-health app. The MAIN Model which examines how an interface features affect the user’s psychology through four Affordances: Modality, Agency, Interactivity, and Navigability was used to assess the presumed credibility of the VHA and likability of the app from the focus group transcripts. Each affordance triggers heuristic cues that stimulate a positive or negative perception of trustworthiness, believability, and understandability thereby increasing source credibility and likability. Data collected in the focus group included feedback on the different content modalities, both text and visual: size and font of the text, VHA appearance, voice, movement, diction, the environment as well as perceptions of the trustworthiness and expertise of the interface. Data related to interactivity and ease of navigation through the

app was also collected and analyzed. All in all, 25 Black men from the community contributed to the development of three iterations of a Black male VHA over an eighteen-month time span. The final version of the Black male-VHA, ALEX is now part of an intervention to increase CRC screening among minority and rural populations.

A042 Impact of a natural disaster on access to care and biopsychosocial outcomes among Hispanic/Latino cancer patients.

Mary Rodriguez-Rabassa¹, Ruthmarie Hernandez¹, Zindie Rodriguez¹, Claudia B Colon-Echevarria¹, Lizette Maldonado¹, Nelmit Tollinchi¹, Estefania Torres¹, Adnil Mulero¹, Daniela Alborns¹, Jaileene Perez-Morales², Idhaliz Flores¹, Heather Jim², Eida M Castro³, [Guillermo N Armaiz-Pena](#)¹. ¹Ponce Health Sciences University, Ponce, PR, USA, ²H. Lee Moffitt Cancer Center and Research Institute, Tampa, FL, USA, ³Ponce Health Sciences University, Ponce, PR, USA.

Background: Cancer is the leading cause of death in Puerto Rico (PR). Hurricane Maria (HM) and its aftermath lead to widespread devastation in the island, including the collapse of the healthcare system. Medically fragile populations, such as cancer patients and survivors, were significantly affected. The goal of the current study was to assess the impact of HM on barriers to care, emotional distress and inflammatory biomarkers among cancer patients in PR. Methods: This exploratory longitudinal study was conducted in health care facilities and community support groups from PR. Cancer patients (n=50) and non-cancer patients (n=50) completed a battery of psychosocial questionnaires and provided blood samples that were utilized to assess inflammatory cytokines levels. Data were analyzed through descriptive, frequencies, correlational and linear regression analyses. Results: Cancer patients that were affected by HM reported increased barriers in accessing medical care, which were positively associated with anxiety, perceived stress, and post-traumatic symptomatology. Moreover, being a cancer patient or survivor, along with closeness in time from HM predicted more barriers to receiving health care. Several inflammatory cytokines were significantly upregulated in cancer patients and positively correlated with barriers to care. Conclusions: HM significantly impacted Puerto Ricans psychosocial well-being. Cancer patients had significant barriers to care and increased serum inflammatory cytokines, but similar anxiety, stress and post-traumatic symptoms compared to non-cancer controls. Impact: These findings demonstrate the urgency of delineating a plan for providing cancer care to patients in the aftermath of a natural disaster while promoting and influencing resilience and well-being.

A043 Cancer care in people with HIV: Identifying adherence challenges to improve outcomes.

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Background: With improved antiretroviral therapy, people living with HIV are aging and non-AIDS-defining cancers have increasing prevalence in this population. Yet, population-based studies demonstrate that people with HIV are less likely to receive cancer treatment, which contributes to lower cancer-specific survival. Past studies have examined cancer disparities at the provider and healthy system levels, but have not explored the drivers of cancer treatment disparities from the patient's perspective. We aimed to investigate barriers and facilitators of cancer treatment among patients living with HIV, along with perceptions of their cancer diagnosis and treatment, to inform future interventions, reduce disparities, and improve outcomes. Methods: We conducted in-depth interviews with 27 HIV-infected cancer patients to examine perceptions and care engagement in this population. We recruited equal numbers of patients who had (a) past cancer treatment, (b) were currently undergoing cancer treatment, or (c) experienced challenges with receiving or completing cancer treatment. Semi-structured interviews explored multiple topics related to HIV and cancer care, including treatment decision-making, patient-provider interactions, stigma, coping, and barriers to care. Patients were recruited until thematic saturation was reached. Results: Study participants were predominantly male (n=22, 81%) with a median age of 56 years and median annual household income of \$24,000. Prevailing themes from the interviews included descriptions of the "devastating" impact of a cancer diagnosis, with a considerable dual burden of pre-existing HIV. Participants noted that having HIV added anxiety about cancer treatment, side effects, and potential treatment interactions. Among those who experienced cancer treatment adherence challenges, barriers included cancer treatment side effects, stigma, transportation difficulties, cost of care, and challenges with coping and mental health. Despite these challenges, participants generally reported having positive healthcare experiences, including compassionate providers, ease of referral, and sound communication. Several participants indicated that their past experiences of coping with HIV had prepared them to accept and address their cancer diagnosis. Conclusions: This is the first qualitative study assessing barriers and facilitators to cancer care among

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people living with HIV and cancer in the U.S. For many HIV-infected patients, a cancer diagnosis creates substantial added stress to an already challenging social and medical situation. Often, these stressors impact patients' ability to complete cancer treatment. Resiliency was noted to be a key facilitator, with participants frequently citing family, friends, faith, and the healthcare system as key sources of support.

A044 Channels and locations influencing the uptake of prostate cancer intervention trials by ethnically diverse Black men. [Malcolm Ingraham](#), Folakemi Odedina, Parisa Fathi, Kim Walsh-Childers, Adaora Ezeani, Yaseen Elhag, University of Florida, Orlando, FL, USA.

Background Black men (BM) are statistically more likely to experience aggressive cases of prostate cancer (CaP) compared to other racial groups, but are less likely to enroll in clinical trials. Several barriers have been documented as impacting the participation of BM in clinical trials. To address these barriers, there is need for unique approaches to identify successful strategies that will facilitate the implementation of effective interventions. The overall goal of this study is to develop a tailored communication strategy for a CaP intervention trial, the MiCaP Research Digest Trial. Specifically, the primary objective was to identify the best intervention trial recruitment channels and locations for US-born BM (USBM), African-born BM (ABBM), and Caribbean-born BM (CBBM). Methods The MiCaP Research Digest Trial uses a randomized waitlist research design to evaluate the effectiveness of disseminating CaP scientific discoveries for public health and community applications. It is an ongoing trial, which started in 2017. The current study compared two channels (newspaper and radio) and four locations (churches, barber shops, community outreach events) relative to their effectiveness in recruiting BM for the trial. Study location was Orange County (FL). Recruitment efforts included newspaper stories about the study, study ad in newspaper, study ad on radio, information about study at community events and distribution of study flyers at targeted locations. Assessment focused on the following for the recruitment channels and locations: (1) reach, which was operationalized as the number of BM reached; and (2) impact, operationalized as the number of BM effectively pre-screened for the Trial. Results The study period is from May to July, 2019. Results presented are for data collected up to June 30, 2019. The reach for BM were: 30 community locations for newspaper; 27,000 people every week from the radio; 130 attendees for church events; an average of 12 customers per day for barber shops; and close to 1,200 attendees combined for the community events. The highest impact (uptake of the intervention trial) was

from community events, with 8 BM recruited (6 USBM and 2 CBBM). One USBM was recruited through the newspaper and one USBBM through radio. There was no recruitment from church or the barbershop. Also, no ABBM has been recruited so far. Conclusion The reach for intervention trials does not necessarily translate to impact. Although the reach was highest for the radio, uptake of the intervention trial was highest for the community events. It was not surprising that the intervention trials uptake was highest for USBM. While 2 CBBM were recruited, recruiting ABBM continues to be challenging. Engaging ethnically-diverse BM through appropriate channels and locations is crucial to effective uptake of intervention trials.

A045 Increasing minority accrual in breast cancer clinical trials through a multidisciplinary approach. Valesca Largaespada¹, Samantha Hurst¹, Savannah M Bradley¹, Myriam I Acosta², Jonathan Unkart¹, Sarah Blair¹, [Jesse Nodora](#)¹. ¹University of California San Diego, La Jolla, CA, USA, ²Burrell College of Osteopathic Medicine, Las Cruces, MX, USA.

Breast cancer is the most common cancer in Hispanic/Latina women in the United States (U.S.). Yet, therapeutic cancer clinical trial enrollment among Hispanic/Latina women remains low. Barriers to participation are varied and multifactorial. Health provider and system level barriers at cancer centers in the U.S. include language and cultural discordant communication among providers and patients, transportation (to/from study site), and provider discomfort and skepticism in patient adherence. Recent studies have found that Hispanic/Latina women do not exhibit major concerns related to trust and if adequately informed and invited to participate in therapeutic trials, they are likely to do so. A qualitative study was conducted to understand the factors that influence participation in breast cancer clinical trials among Hispanic/Latina breast cancer patients. We conducted 10 semi-structured in-depth interviews in Spanish with women currently receiving radiation treatment, to identify patient level barriers and facilitators for clinical trial participation. Participants were recruited from the University of California (UC) San Diego Moores Cancer Center and UC Health System-affiliated radiation oncology center. Data were analyzed using a conventional content analysis framework to describe the personal and emotional reactions of Hispanic/Latina women who have been breast cancer patients. The main strength of this approach is to allow ideas and beliefs to emerge from the data to provide new insights that capture key thoughts and values of our participants and their treatment experiences and preferences. The analysis

and interpretation were specifically conducted in Spanish to maintain language and cultural concordance with our participants. The final analyses were translated from Spanish to English by bilingual and bicultural study investigators. Preliminary findings reveal that Hispanic/Latina women are more likely to participate in breast cancer clinical trials if study information is delivered in-person, the study location is geographically close to their home, they receive appointment reminders by phone or text, study appointment duration is short, the study uses less invasive medications/treatments, and study personnel deliver a supportive experience (i.e. respectful and professional) during enrollment and throughout the study. Barriers to participation include language concordance, a lack of information about cancer clinical trials, fear of potential risks, a competing focus between their current cancer treatment and clinical trial activity, and a lack of time. Our final in-depth analyses will present detailed thematic results, interpretation, and practice application. These outcomes may guide efforts to improve racial/ethnic minority therapeutic clinical trials enrollment, retention, and related outreach among Hispanic/Latina patients accessing care at comprehensive cancer centers.

A046 Collecting nonclinical data to address disparities in cancer prevention: Lessons from the field. [Tasleem J. Padamsee](#). The Ohio State University, Columbus, OH, USA.

Background and Purpose: Research on how women at high-risk of breast or ovarian cancer make risk-reduction choices is still developing, and rarely addresses minority and underserved populations. Early findings indicate that African American women face additional burdens at every stage of the decision-making process. Because most high-risk African American women do not receive clinical care related to risk, further research requires recruitment methods that do not rely on the clinical populations commonly used in risk-reduction studies. Procedures: The Daughter, Sister, Mother Project has recruited high-risk African American and White women from non-clinical environments to collect both qualitative (semi-structured interview) and quantitative (survey) data. Non-clinical recruitment methods include contacting women through social media, online volunteer databases, and community organizations. They present unique challenges for which we have developed specific solutions. Results: Our experience recruiting non-clinical but high-risk populations has yielded solutions that may be useful to other researchers. (1) Risk prediction modeling. Because the individual risk level of women recruited through non-clinical methods is usually unknown, risk prediction modeling must be built into the data collection process.

Telephone screening by trained research staff allows risk prediction modeling before study enrollment, and replaces the risk-level information that would pre-exist participant recruitment in a clinical setting. Collecting risk-related information within a survey instrument makes it possible for participants to complete a survey in one interaction, but requires risk-prediction modeling and sample trimming after the data have been collected. (2) Hacking and fraudulent accounts. Combining online data collection with social media recruitment facilitates the involvement of participants not commonly drawn into biomedical research, but also exposes studies to hackers and fraudulent participants. To avoid (a) losing incentive funds to hackers and (b) incorporating fraudulent information into study datasets, we have developed methods to distinguish “real” from “fake” participants. These include survey programming methods that detect or weed out fraudulent accounts, semi-automated methods to locate impossible data combinations, and direct phone contact with participants after data collection is complete. (3) Ongoing connections. Some African American women not already involved in high-risk clinical care are also hesitant to become involved in health-oriented research. Trust can be built through connections with community organizations, fostering ongoing two-way contact with our research team, and returning useful information to the communities where we learn it. Conclusion: Recruitment of non-clinical populations is a useful tool for cancer health disparities research, and requires creative recruitment, data collection, and data cleaning methods.

A047 The patient experience: Clinical trial knowledge, attitudes and participation among diverse populations. [Carla Strom](#)¹, Karen M. Winkfield², Janet A. Tooze³, Jimmy Ruiz⁴, Kelsey Shore¹, Kathryn E. Weaver⁵. ¹Office of Cancer Health Equity, Wake Forest Baptist Comprehensive Cancer Center, Winston-Salem, NC, USA, ²Wake Forest School of Medicine, Department of Radiation Oncology, Winston-Salem, NC, USA, ³Wake Forest School of Medicine, Department of Biostatistics and Data Sciences, Winston-Salem, NC, USA, ⁴Wake Forest School of Medicine, Department of Internal Medicine, Section on Hematology Oncology, Winston-Salem, NC, USA, ⁵Wake Forest School of Medicine, Department of Social Sciences and Health Policy, Winston-Salem, NC, USA.

Introduction: Participation in cancer clinical trials (CTs) is historically low, particularly for underserved populations, including racial/ethnic minorities. Wake Forest Baptist Comprehensive Cancer Center developed a population health navigation program to improve access to cancer care and CTs

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among Hispanic patients through linguistically and culturally concordant navigation services. The role of the Hispanic Patient Navigator (HPN) includes educating all navigated patients about CTs. To inform expansion of the program, we sought to understand the knowledge and attitudes of underserved patients at WFBCCC regarding CTs and CT participation. Methods: Patients receiving cancer care in the adult oncology clinic at WFBCCC were purposively sampled to enroll a diverse sample with regards to race, ethnicity, insurance coverage, age, and rural-urban residence. Survey domains included CT knowledge (Ellis et al., 2016) attitudes about CTs (positive beliefs and patient involvement scored from 0-100; Jenkinson et al., 2005) and participation in clinical research as part of cancer care. ANOVA and chi-square/Fisher's exact tests compared responses by race and ethnicity. Results: We enrolled 247 participants (85% participation); 50.6% were White, non-Hispanic (NHW), 27.1% Black, non-Hispanic (NHB), and 22.3% Hispanic, all races. The majority were female (54.5%) with a median time since cancer diagnosis of 2.8 years. Common cancer types included hematologic (36.4%), breast (20.6%), gastrointestinal (12.6%), and thoracic (9.3%). Hispanics were more likely to report less than a high school education (47.3% vs 10.4% NHW and 17.9% NHB) and not having enough money to meet the daily needs of their families (45.5% vs 13.6% NHW and 17.9% NHB), $p < .001$. NHW, NHB and Hispanic cancer patients reported similar positive attitudes about CTs (positive beliefs mean=77.7, std=17.6) and willingness to participate (patient involvement=76.7, std=18.9), $p > .05$ for both comparisons. A larger proportion of NHWs had heard of clinical trials (92.8%), compared to 79.1% NHBs, and 56.4% of Hispanics. NHWs also had greater CT knowledge (mean=3.5, 0-7 scale) than NHBs (mean=2.5), and Hispanics (mean=1.9), $p < .0001$. There was a trend towards slightly lower CT participation among Hispanic patients, with 42.4% of NHWs, 38.8% of NHBs, and 29.1% of Hispanics self-reporting participation in clinical research ($p = .089$). Conclusions: Results support the continued role of a HPN to provide clinical trials education to cancer patients. Although self-reported clinical trial participation was slightly lower among Hispanics, it approached 30%, and we observed concurrent increases in Hispanic patient enrollment on cancer center trials. Expansion of the population health navigator program to Black patients would provide opportunities to enhance clinical trial knowledge and participation in additional underserved patients.

A048 Clinical trials knowledge and participation in rural and urban cancer survivors at a Comprehensive Cancer Center in the Appalachian region.

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Introduction: Enhanced participation in clinical trials has been proposed as a strategy to reduce rural cancer disparities. We examined rural-urban differences in clinical trials knowledge and participation among cancer patients seeking oncology care to prepare for outreach activities with rural communities in our cancer center catchment area. Methods: We purposively sampled patients presenting for oncology care to enroll a diverse sample with regards to race, ethnicity, insurance coverage, age, and rural-urban residence. Participants completed a single survey assessing their patient experience, including 7 items assessing oncology clinical trial knowledge (Ellis et al., 2016), two scales assessing attitudes towards clinical trials (positive beliefs and patient involvement) scored from 0-100 (Jenkinson et al., 2005), and reported participation in clinical research or trials as part of cancer treatment. Rural residence was categorized according to the Federal Office of Rural Health Policy (Rural Urban Commuting Areas Codes 4-10). T-tests and chi-square/Fisher's exact test compared responses of rural and urban residents. Results: A majority of survey participants (85% participation rate, N=249, 54.4% female; 50.2% White non-Hispanic, 26.9% Black non-Hispanic, 22.1% Hispanic; 22.1% rural; 47.4% High School education or less) were currently receiving active treatment (60.8%); the median time since cancer diagnosis was 2.8 years. Common cancer types included hematologic (36.1%), breast (20.5%), gastrointestinal (12.9%), and thoracic (9.6%). Most participants had heard of a clinical trial (81.1%); 38.6% reported participation in a clinical trial as part of their cancer treatment. Overall clinical trial knowledge was low (mean correct answers= 2.9 of 7, std=1.9); participants held relatively positive clinical trial attitudes (positive beliefs mean=78.8, std=15.8 & patient involvement=76.9, std=15.1). There were no significant differences by rural/urban residence for knowledge or beliefs (all $p > .10$). There was a statistically significant difference in reported clinical trial participation; 52.7% of rural participants reported participating in a clinical research study/trial vs 34.5% of urban participants, $p < .05$. Conclusion: We observed relatively high clinical research participation and positive attitudes among cancer patients seeking care at a Comprehensive Cancer Center. Community outreach efforts should address gaps in clinical trials knowledge and practical barriers to enrollment for both rural and urban patients. With

support, rural cancer research participants could serve as research ambassadors or navigators for other residents in their communities.

A049 Socioeconomic disparities in treatment delays and survival for anal cancer patients. [Tessnim R Ahmad](#), Matthew Susko, Karla Lindquist, Mekhail Anwar. University of California, San Francisco, San Francisco, CA, USA.

Background: Socioeconomic status (SES) is associated with treatment delays and survival in multiple cancers, but less data exist for anal squamous cell carcinoma (ASCC). This study investigated the association between SES and outcomes for patients undergoing definitive chemoradiation therapy for ASCC. Methods: Patients diagnosed with non-metastatic ASCC between 2005 and 2018 were retrospectively reviewed. Socioeconomic predictor variables included primary payer, race, income, employment, and partnership status. Outcomes included tumor-node (TN) stage at diagnosis, the interval from diagnosis to treatment initiation, relapse-free survival (RFS), and overall survival (OS). Age, gender, TN stage, and HIV status were analyzed as covariates in survival analysis. Results: Over the study period, 111 patients met inclusion criteria. SES was not associated with the TN stage at diagnosis. SES factors associated with treatment delays were Medicaid payer ($p = 0.016$) and single partnership status ($p = 0.016$). Compared to privately insured patients, Medicaid patients had lower two-year RFS (64.4% vs. 93.8%, $p = 0.021$) and OS (82.9% vs. 93.5%, $p = 0.038$). Similarly, relative to patients in the racial majority, racial minority patients had lower two-year RFS (53.3% vs. 93.5%, $p = 0.001$) and OS (73.7% vs. 92.6%, $p = 0.008$). Race was an independent predictor for both RFS ($p = 0.027$) and OS ($p = 0.047$). Conclusions: These results highlight the impact of social contextual factors on health. Interventions targeted at socioeconomically vulnerable populations are needed to reduce disparities in ASCC outcomes.

A050 Oncology Registered Dietitians' knowledge, attitudes and practices related to food insecurity among cancer patients: A qualitative study. [Amirah A Burton-Obanla](#), Stephanie Sloane, Brenda Koester, Craig Gundersen, Barbara H Fiese, Anna E Arthur. University of Illinois, Urbana, IL, USA.

Introduction: Food insecurity (FI) has been associated with negative health outcomes, including poor quality of life (QOL) and chronic diseases such as cardiovascular disease and diabetes. However, the association between FI and cancer is largely unknown. No comprehensive practice guidelines or consensus criteria currently exist

regarding screening for and addressing FI in oncology clinics. Registered Dietitian Nutritionists (RDNs) are on the front lines of nutritional care provided to patients across the cancer continuum, but it is unknown if and how oncology RDNs address FI with their patients. The purpose of this study was to assess oncology RDNs' knowledge, attitudes and practices related to FI among cancer patients. Methods: One-on-one, semi-structured interviews were conducted with 41 oncology RDNs working at various types of cancer centers across the U.S. and recruited through the Oncology Nutrition Dietetics Practice Group of the Academy of Nutrition and Dietetics. Interviews were conducted by telephone using Microsoft Lync and recorded using the audio software program, Audacity®. Interviews lasted an average of 60 minutes and were conducted by a research specialist trained according to the Ecocultural Family Interview protocol. The interviews were coded by research specialists using a semantic approach to thematic analysis. Data were analyzed using Dedoose. Results: Findings revealed that oncology RDNs are generally aware of the term "food insecurity" and can accurately define it. RDNs believe that FI is a problem for many of their patients and that cancer patients are more likely to be negatively affected by FI compared to healthy adults. RDNs identified potential adverse consequences of FI for cancer outcomes such as poor nutritional status, QOL and tolerance to treatment. Few RDNs reported that they regularly ask their patients about their ability to afford necessary food. Further, the vast majority of RDNs had not heard of or used a validated assessment tool to identify food insecure cancer patients. Conclusions: Most oncology RDNs are knowledgeable about FI and are concerned about the potential negative impact on cancer outcomes. However, most do not use a validated assessment tool to identify cancer patients who may be food insecure. These findings can inform observational or intervention work focused on screening for and addressing FI in oncology settings.

A051 Regional lung cancer mortality disparity by their socioeconomic status in 246 municipalities in South Korea during 2008-2017. [Sungwon Byun](#), Sun-Young Kim. National Cancer Center Graduate School of Cancer Science and Policy, Ilsan, South Korea.

Lung cancer is a main cause of cancer death worldwide. In particular, many studies reported geographical disparity of lung cancer mortality (LCM) related to socioeconomic status (SES). While lung cancer is also a leading cause of death in South Korea, few studies investigated geographical disparity attributable to SES. We aimed to explore the geographical distributions of LCM according to three SES indicators across

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246 municipalities and their temporal patterns during 2008 to 2017 in South Korea. Our study will provide an insight into LCM disparity associated with SES gradients and guidance for policy-related activities. We obtained lung cancer age-standardized mortality rate (ASMR) in 246 municipalities for 2008-2017 from the Statistics Korea (KOSIS). We also used three SES factors for the same areas and period: income, education, and elderly population. Monthly income and education levels were obtained from the Community Health Survey (CHS): a nationwide, community-based, individual survey conducted annually since 2008 by the Korea Centers for Disease Control and Prevention. Elderly population (aged over 65) proportions were obtained from the KOSIS. We used averages of ASMR for three periods of 2008-2010, 2011-2013, and 2014-2017, while we used SES indicators from years 2009, 2012, and 2015, each representing the three periods. For CHS-collected SES factors, we computed the proportions of low-income earners with less than 2 million won monthly income and those with less than college education. Ranked municipalities by proportions of low income, education, and high elderly population were categorized into quintiles for each SES indicator. Then, we created boxplots based on SES quintiles and explored geographical disparity patterns by three periods. Temporal patterns in regional-disparity level were studied with line plots of absolute and relative ASMR differences. Absolute difference was the difference in the average ASMR in each SES quintile from that in 1st quintile. Relative difference was the absolute difference divided by the average ASMR in 1st quintile. Lung cancer ASMRs were generally higher in the municipalities with lower income and education level (median in 1st and 5th quintile in Period 2=25.8 and 23.9; 25.8 and 23.5, respectively). For elderly population, we did not find a clear pattern for the first two periods but turned to show an increase in period 3. Absolute and relative differences overall decreased for income and education level but with an exception in the difference in 3rd quintile which increased back in period 3. For elderly population, relative differences overall increased. Despite improved absolute and relative differences, we found municipality-level lung cancer ASMR being disproportionately distributed according to their income and education level throughout all periods. For effective health policies to reduce district-level LCD disparity, further studies that consider other regional characteristics for correlation analyses are needed.

A052 Multilevel determinants of financial toxicity in breast cancer care: Perspectives of healthcare professionals and Latina survivors. Perla Chebli¹, Jocelyne Lemus¹, Corazón Avila¹, Kryzta Peña¹, Bertha Mariscal², Sue Merlos², Judy Guitelman², Yamilé Molina¹. ¹University of Illinois at Chicago,

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Purpose: Financial toxicity is a multidimensional side effect of cancer treatment. Most relevant research has focused on patient perspectives in characterizing individual-level determinants of financial toxicity. This study examines the multi-level determinants of financial toxicity from the perspectives of Latina breast cancer survivors and healthcare professionals. **Methods:** We analyzed qualitative data from focus groups with 19 Latina breast cancer survivors and interviews with 10 healthcare professionals recruited through community partners and venues in Chicago. **Results:** At the individual level, lack of knowledge of treatment-related costs and insurance coverage were shared concerns among survivors and healthcare professionals; healthcare professionals viewed this lack of knowledge as driving delays in financial planning, while survivors prioritized survival over financial concerns after diagnosis. At the interpersonal level, both groups viewed social networks as platforms for disseminating information on financial resources. At the community level, healthcare professionals identified community norms and dynamics as barriers to seeking financial assistance, while survivors suggested that access to culturally-astute community-based organizations may eliminate these barriers. At the organizational/health policy level, healthcare professionals reported that Latina patients' access to financial assistance programs is compromised by restrictive eligibility criteria, leading to worse financial burden among ineligible patients according to survivors. Healthcare professionals noted the limited availability and instability of financial assistance programs, and both groups agreed that such programs were limited post-treatment. **Conclusion:** Our findings suggest that multi-level interventions at the patient, clinical team, healthcare, and policy levels may be needed to adequately address financial toxicity in cancer survivors.

A053 Association between socioeconomic status and access to specialized cancer consultation and treatment among advanced gastrointestinal cancers. Laura E Davis¹, Natalie G Coburn², Julie Hallet², Craig C Earle², Sten Myrehaug², Ying Li³, Alyson L Mahar⁴. ¹Sunnybrook Research Institute, Toronto, Ontario, Canada, ²Odette Cancer Centre, Toronto, Ontario, Canada, ³ICES, Toronto, Ontario, Canada, ⁴University of Manitoba, Winnipeg, Manitoba, Canada.

Introduction: Gastrointestinal (GI) cancers of the pancreas, esophagus, stomach, colon and rectum often present at an incurable stage. Treatments such as chemotherapy and radiotherapy can improve quality and quantity of life for patients with these advanced gastrointestinal (GI) cancers. However, many patients fail to receive such treatments

or even consult with a cancer specialist to determine if treatment is an option. Socioeconomic status (SES) is associated with cancer outcomes, but the mechanisms as to why, such as access to specialized care, are not clearly established. This study examined the association between SES and receipt of specialized cancer consult and treatment in Ontario, Canada. Methods: This was a population-based retrospective cohort study of advanced GI cancer patients diagnosed between 2007 and 2017 using linked administrative databases. The exposure of SES was defined using the deprivation item in the Ontario Marginalization Index. The outcome of oncology consult was defined as a consultation with either a radiation oncologist or a medical oncologist and the outcome of treatment was defined as receipt of chemotherapy or radiotherapy. Both were measured in the year following diagnosis. Multivariable Cox-proportional hazards regression models were used to determine association of deprivation with oncology consult and treatment. Confounders identified a priori include age, sex, comorbidities and cancer site. Results: 29,297 patients had a diagnosis of advanced GI cancer and were included in the study. 27.4% of the cohort did not have an oncology consult and 53.7% did not receive treatment in the year following diagnosis. The most deprived quintile compared to the least deprived quintile was associated with decreased consult (HR 0.89 (0.85-0.93)) and decreased treatment (HR 0.81 (0.77-0.86)) after adjusting for confounders. Conclusion: This study found that even in a single-payer universal healthcare system, SES is associated with access to specialized cancer care. Future research should examine mechanisms through which policy might help low SES patients access specialized cancer care.

A054 Sociodemographic disparities in gastric adenocarcinoma: A population-based study. Rohit Gosain¹, Navpreet Rana², Riccardo Lemini³, Chong Wang¹, Sarbajit Mukherjee¹. ¹Roswell Park Comprehensive Cancer Center - University at Buffalo, Buffalo, NY, USA, ²University at Buffalo, Buffalo, NY, USA, ³Mayo Clinic, Rochester, MN, USA.

Background: Gastric cancer is one of the leading causes of cancer-related mortality worldwide, with a global burden of 5.7% new cases each year and 8.2% of cancer-related deaths. Area of residence has been found to affect survival in different cancers but their impact on gastric cancer remains largely unknown. The purpose of this study is to address the potential disparities between the rural and urban populations affected specifically by gastric adenocarcinoma. Methods: We conducted a retrospective study, analyzing different socio-economic factors associated with populations affected

by gastric adenocarcinoma between 2004 and 2013. Data was obtained from the National Cancer Database (NCDB). Univariate and multivariable analyses were performed to evaluate overall survival (OS). Different socio-demographic factors, location of residence were included, urban area (UA) or rural area (RA), gender, race, insurance status and marital status were included in the analyses. Results: A total of 88,246 [RA, N=12,365; UA, N=75,881] patients were included in the study. Majority of the study population was white (N = 67,792, 77%) and male (N = 59,574, 68%). Univariate and multivariable analysis showed that RA had the worst OS (univariate - HR=1.08, p<0.001; multivariate HR=1.04; p<0.001) compared to UA. When comparing different racial backgrounds, univariate and multivariable analysis showed Native American and African American population had poor OS when compared to the white population, however, Asian patients tend to have better OS (univariate HR=0.66, multivariable HR=0.68, p<0.01). From quality of care standpoint, UA patients median days to undergo surgery (28 vs. 33; p<0.01) post diagnosis was significantly sooner, with significantly fewer positive margins (6.3% vs. 6.9%; p<0.01) when compared to RA patients. Though, there is no minimum number of lymph nodes examined during resection, but total of 15 or above is an accepted practice. When comparing the lymph node dissection, 19.6% UA patients underwent more than or equal to 15 lymph nodes dissection in comparison to 18.7% patients in RA (p=0.03). Discussion: This study identifies socio-demographic disparities in gastric adenocarcinoma. Access to healthcare, variations in patient care, environmental and lifestyle factors as well as genomic differences are all potential factors that affect the OS. This is consistent with the available literature in gastric cancer, including studies demonstrating survival differences in different populations undergoing surgical treatment in the United States. Based on the above data, it is imperative for future health policy initiatives to address these disparities in an effort to improve OS.

A055 A case study of co-occurring burdens experienced by a Hispanic mother diagnosed with cancer and its implications for a cancer education program in the U.S.-Mexico border region. Adriana Hernandez, Isela Garcia, Clara Reyes, Rebecca Palacios. New Mexico State University, Las Cruces, NM, U.S..

Purpose: This study explored a cancer survivor's description of the burdens she experienced in addition to her cancer diagnosis while participating in a cancer education program. While this case study's primary aim was to identify these co-occurring burdens, the secondary aim was to develop

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responsive program protocols that would not interfere with program dosage and fidelity. Introduction: Several studies have assessed the significant burden that cancer poses to diagnosed individuals. While researchers have worked to develop programs that improve the survivorship experience, such efforts have largely been validated with non-Hispanic white patients who are more socially and economically privileged than cancer survivors from underserved populations. While there is some research on the cancer survivorship experiences of racial/ethnic minority groups, few programs are exclusively designed to address the burden that cancer poses in these already burdened groups. As researchers work to engage racial/ethnic minority participants in cancer education programs designed to improve cancer survivorship, they may encounter unexpected challenges when working with these new consumer groups. This case study explored the multiple burdens reported by a cancer diagnosed Hispanic woman participating in a cancer education program. Methods: The participant was a Spanish-speaking Hispanic mother diagnosed with cancer and residing on the U.S.-Mexico border. Baseline participant demographics, cancer fatalism, depression, anxiety, and acculturation levels were collected. In each of the five bi-weekly program sessions, the participant was asked to report any cancer-related emotional triggers she experienced since her last session. Each education session was audio recorded, transcribed, and translated to English. Two coders analyzed the translated transcriptions using inductive content analysis. The trustworthiness of the analysis was protected by coding to consensus, peer debriefing, and maintaining audit trails. Results: The participant exhibited clinical levels of both depression and anxiety, high cancer fatalism, and a low level of acculturation. Co-occurring burdens described by the participant included Low SES, Negative Cancer Effects, Domestic Violence, Family Concerns, and Issues with Communication and Isolation. This participant reported a variety of emotions and limited coping strategies in response to these burdens. Various protocols were developed to support participants with multiple burdens and to protect the fidelity of the original cancer education program. Conclusion: These findings revealed the excessive burden and challenges affecting the cancer survivorship of a Hispanic mother diagnosed with cancer. As other low-SES Hispanics cancer survivors may be facing similar challenges, researchers should be prepared to develop study protocols, particularly when implementing evidence-based programs validated with privileged populations.

A056 A study of race and socioeconomic status impacting therapeutic clinical trial enrollment in adult gliomas patients. Sheantel J Reihl¹, Ramin A Morshed², Sofia Kakaizada², Eric Zhang², Jacob S Young², Jennifer Clarke², Nicholas Butowski², Jennie Taylor², Nancy Ann Bush², Manish K Aghi², Mitchel S Berger², Susan Chang², Shawn L Hervey-Jumper². ¹UCSF School of Medicine, UCSF Department of Neurosurgery, San Francisco, CA, USA, ²UCSF Department of Neurosurgery, San Francisco, CA, USA.

Introduction: Under-enrollment in clinical trials significantly limits valid analyses of clinical interventions and generalizability of findings. It can also result in premature study termination, with estimates of 22% to 50% of clinical trials being terminated due to poor accrual. Currently, there are limited reports addressing the influence of race, ethnicity and socioeconomic status on clinical trial enrollment in patients with adult glioma. The goal of this study was to determine if race and socioeconomic status impacts clinical trial participation for glioma patients. Methods: A search within the UCSF Tumor Board Registry identified 852 adult patients discussed over a 2-year period. This cohort was analyzed to determine the rate of therapeutic clinical trial consideration, tumor board recommendation, and study enrollment based on clinical reports available through the electronic medical record. Results: At the time of initial diagnosis, 30.7% and 18.0% of glioma patients were recommended and enrolled in a therapeutic clinical trial, respectively. At the time of recurrence, 38.7% and 25.3% of patient were recommended and enrolled in a clinical trial, respectively. Nineteen percent of the study population belonged to a NIH designated underrepresented minority group, with Asian/Pacific Islander patients comprising 10.3% of the total patient cohort. Percentage of patients who enrolled in a clinical trial was comparable between subgroups. On univariate analysis, only in-state location, distance to the hospital, and WHO grade were associated with consideration, recommendation, and enrollment at initial diagnosis and recurrence. Minority status, insurance type, median household income, and percent below poverty line based on county of residence were not associated with clinical trial recommendation or enrollment. Conclusion: Race and socioeconomic status did not impact clinical trial consideration, tumor board recommendation, or study enrollment. Our results do not support the premise that provider decisions are impacted by biases based on minority or socioeconomic status.

A057 Influence of race and economic deprivation on metastatic breast cancer outcomes.

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Background: Metastatic or Stage 4 breast cancer (MBC) is a heterogeneric, life ending illness with a treatment course of multiple sequential therapies. There are documented racial disparities in breast cancer outcomes and treatment equity, but little is known about the racial or socio-economic differences during MBC and end of life (EOL) care. Aim1: Describe a cohort of patients deceased from MBC - patient, tumor, treatment, symptoms and end of life care characteristics. Aim 2 - Compare patient, symptoms and end of life care characteristics according to race and neighborhood deprivation. Methods: Cohort of deceased patients from large, breast cancer program from October 2016 until June 2019. Protocolized, retrospective chart review for patient (age, race, neighborhood deprivation score ,derived from zip code), tumor (ER, PR, Her 2, subtype), symptoms (25 symptoms + overall wellbeing rated 0-10 at last visit before death; generalized anxiety, screening depression and overall distress), end of life care (palliative care consult, hospice, length of time in hospice, place of death, ICU admission prior to death, goals of care discussion documented). Results : Cohort of N=130. Black - N=17 (13%); White - N=112 (86.2%). Dichotomized according to median (69) NDI, N=58 (49.2%) in more deprived neighborhoods. Triple negative breast cancer subtype N= 7(41%) Black and N=34 (30%) white. Survival: Survival overall was 1175 days. Black survival was less than half of white. Black – 501 days (SD – 339); White – 1242 days (SD 1363), p=.031.No survival differences according to neighborhood. Of the 25 symptoms measured during breast cancer treatment cough ,nausea, hot flashes, headaches, and overall health were significantly (p <.05) worse for black vs. white patients with no differences noted for other symptoms. Dizziness, nausea, vomiting, anxiety, depression, overall distress and overall health were significantly (P<.05) worse for patients from more deprived neighborhoods. Among the 130 deceased MBC patients N=108 (81.8%) had palliative care services, N=65 (50%) had no advance directives, N=52 (40%) did not use hospice services, and N=16 (12%) died in the ICU. No difference between Black and White patients or patients from more vs. less deprived neighborhoods for these outcomes. Conclusion: There is racial and economic disparity in MBC survival and symptoms prior to death. Overall end of life planning is not well addressed in this population.

A058 Patient and neighborhood factors associated with receipt of surveillance colonoscopy among Medicare beneficiaries with surgically resected colorectal cancer.

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Background: After colorectal cancer (CRC) surgery, surveillance with colonoscopy is an important step for the early detection of local recurrence. Unfortunately, surveillance colonoscopy is underutilized and only about 55% of CRC patients receive a colonoscopy as recommended. Lower rates are observed among racial/ethnic minorities. Identifying the factors that contribute to disparities in receipt of surveillance colonoscopy can assist researchers in developing targeted interventions to promote surveillance colonoscopy for the early detection of recurrence. Purpose: This study assesses the association between patient- and neighborhood-level factors and receipt of surveillance colonoscopy. Methods: This retrospective population-based cohort study uses the National Cancer Institutes' Surveillance, Epidemiology and End Results (SEER) – Medicare linked data collected from 2009 to 2014. We identified beneficiaries with surgically resected CRC stages II and III between the ages of 66 and 85. We used multivariate logistic regression to assess the effect of factors on receipt of colonoscopy. Results: A total of 6,602 patients were identified. Overall, 57.5% of patients received a colonoscopy within 18-months after surgery. After adjusting for patient- and neighborhood-level factors, Blacks had 29.6% lower odds of receiving a colonoscopy compared to non-Hispanic Whites (NHWs) (p=.002). Hispanics had 12.9% lower odds of receiving a colonoscopy compared to NHWs, however, this association was not significant (p>.05). Among NHWs, older age, male gender, and single status were significantly associated with lower odds of receipt of colonoscopy. Clinical factors, such as higher stage, no comorbidities and receipt of chemotherapy, were significantly associated with higher odds of receipt of colonoscopy, but only among NHWs. The odds of receipt of surveillance colonoscopy was 35% lower among NHWs patients with Medicaid coverage compared to NHWs without coverage. Although not significant, Black and Hispanic patients with Medicaid coverage were more likely to receive a colonoscopy compared to their racial/ethnic counterparts without coverage. Hispanics residing in neighborhoods with median household incomes of \$90K+ had significantly lower odds of receipt of colonoscopy compared to Hispanics residing in neighborhoods with incomes of \$0-\$30K. Conclusion: Receipt of initial surveillance colonoscopy remains low and disparities exist between Blacks and NHW patients. The

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association between factors that assess a patient's ability to access colonoscopy and actual receipt of colonoscopy suggest inequitable access to surveillance colonoscopy within and across racial/ethnic groups.

A059 The influence of social determinants of health on primary and secondary cancer prevention health-seeking behaviors among refugees in Middle East and North Africa host countries. Jordan Freeman¹, Marie Ricciardone¹, Richard Sullivan², [Vidya Vedham](#)¹. ¹NCI Center for Global Health, Rockville, MD, USA, ²Institute of Cancer Policy and Centre for Study of Conflict & Health, King's College, London, UK.

The National Cancer Institute (NCI) recognizes 'cancer health disparities' as adverse differences in cancer incidence, mortality, and burden that exist among specific population groups. Refugee populations often lack access to primary care and health screening or preventive services, leading to late diagnosis, higher cancer burdens of cancer-related outcomes and mortality. The disproportionate burden of cancer in refugee populations, necessitates research on specific determinates and disparities influencing their cancer care. Ongoing conflicts across the Middle East and North Africa (MENA) region have caused an unprecedented displacement of individuals to host countries. Four countries in the region, Jordan, Lebanon, Palestinian territories, and Turkey, host more than an estimated 3 million refugees collectively. As the region experiences a shift in disease burden to non-communicable diseases, the health systems of these host countries are placed under increased pressure to manage chronic conditions of refugees, such as cancer.² These large-scale displacements in the MENA region present a unique opportunity to better understand the drivers of health disparities with the aim of improving cancer health in refugee populations. Through a Social Determinates of Health (SDOH) framework, this study aims to understand the landscape of health seeking behaviors for cancer prevention among refugees in Jordan, Lebanon, Palestinian territories, and Turkey. This is a first step to inform future research and initiatives around refugee cancer services. A systematic literature review was completed according to PRISMA standards, with assistance from the NIH Library. A review protocol was developed, and all literature that met eligibility criteria was included. Thematic coding and analysis was then performed to describe observational associations between cancer prevention behaviors and SDOH among refugees. The results reveal patterns in which SDOH directly and indirectly influence the landscape of refugee health seeking behaviors for cancer prevention services in their host countries. The SDOH that most clearly influenced cancer prevention

behaviors include health system capacity, navigating host country's health system, delivery of cancer prevention services, acculturation, competing social, health, and financial priorities, and the built environment. These interrelated constructs impact refugees' ability to access and participate in cancer prevention services, as both enabling and inhibit factors. The influence of SDOH on seeking cancer care are important for refugee populations around the world since they are faced with comparable contextual factors that both enable and inhibit health seeking behaviors. Understanding the interplay between the SDOH constructs is pivotal towards developing targeted interventions by host countries to improve cancer prevention behaviors and health outcomes among refugees.

A060 Socioeconomic status and quality of life among Chinese American breast cancer survivors: The role of post-traumatic growth. [Carol Wang](#), Qian Lu. University of Texas MD Anderson Cancer Center, Houston, TX, USA.

Purpose: Socioeconomic disparities in psychosocial adjustment to breast cancer has garnered little attention. Those who are medically underserved with little to no access to quality health care are more likely to be diagnosed with late-stage cancer, have more complications, and face psychosocial and cultural factors that impact their quality of life. Socioeconomic status (SES) is a multidimensional construct that is typically comprised of income, education, and occupation. Recent research suggests that these indicators impact cancer health in independent manners. Moreover, increasing evidence supports the health protective features of having meaning in life. A recurrent theme is resilience – the ability to regain or maintain well-being in the face of adversity. The perceived benefits one reports (e.g. better relationship quality, greater sense of self-efficacy, etc.) after experiencing a stressful life event is known as post-traumatic growth (PTG). This study examines the relationships between SES indicators (e.g. education, household income), quality of life (QOL), and the role of PTG as an underlying mechanism in the impact of SES in psychosocial adjustment to breast cancer among Chinese American breast cancer survivors (CABCS). Methods: 136 CABCS completed a baseline questionnaire from a larger, intervention study. Results: Education and household income were all positively related to overall quality of life. Education was positively related to functional QOL and additional breast cancer concerns. Annual household income was positively related to all QOL domains. Regression analyses revealed an association between household income with PTG and PTG with overall QOL. Bootstrapping analyses supported

a full mediation as the indirect effect of household income on overall QOL through PTG was statistically significant. Further examining QOL subscales, PTG was associated with better social QOL and household income showed a significant indirect effect on social QOL through PTG suggesting PTG fully mediates the effect of household income on social QOL. PTG was associated with better emotional QOL and less breast cancer concerns. However, the total effect of household income on emotional QOL was non-significant. The total effect of PTG on breast cancer was marginally significant ($p = .06$). Analyses for education failed to reveal any significant direct or indirect effect on overall QOL and its subscales through PTG. Conclusion: These findings suggest that SES indicators such as household income and educational attainment are differentially related to QOL domains among CABCs. Household income is linked to better social and emotional QOL through reported PTG suggesting that findings benefits within adversity including reported meaning may enhance well-being. This underscores the differential role of socioeconomic indicators when assessing health outcomes and the importance of implementing psychosocial interventions that facilitate PTG in improving QOL among immigrant cancer survivors.

A061 The Breast Cancer, Race and Place study: Exploring the influence of race, racism, and residential segregation on cancer survivorship among Black women in Milwaukee, Wisconsin. [Staci Young](#), Natalie Jones, Charissa Fritzen-Pedicini, Sima Namin, Kirsten Beyer. Medical College of Wisconsin, Milwaukee, WI, USA.

Introduction: Racial breast cancer survival disparities persist, indicating that not all populations are benefitting equally from advances in cancer control. Individual and health care factors do not fully explain these disparities, and factors such as institutional racism and racial segregation may be contributors. Our study explores the ways in which Black women in a highly segregated metropolitan area navigate cancer survivorship. Methods: The study utilizes novel qualitative methods and is guided by a community advisory board. Participants were recruited from Milwaukee, Wisconsin, a hyper-segregated city. We use a stratified, purposive sampling approach to include survivors who vary by neighborhood racial and ethnic composition. Eligible participants have been diagnosed with breast cancer, identify as Black, and have completed their initial treatment regimen. The study population is diverse in age, tumor type and stage at diagnosis to ensure multiple perspectives. Instruments and processes were guided by a conceptual framework relating racism and racial segregation to breast cancer survival. We

use narrative inquiry as a reflexive tool in which participants' lived experiences are captured as textual representations. Semi-structured interviews include a demographic questionnaire, a life narrative account, and completion of a life history calendar detailing residential history since diagnosis. Interviews were transcribed and analyzed utilizing a hybrid approach of both a data-driven inductive process and a deductive, a priori coding template consistent with the conceptual framework. We present early findings from this ongoing study. Results: To date, 18 interviews have been completed with Black women. Participants lived in neighborhoods that were predominantly Black (50%), diverse (28%), and predominantly white (22%). Ages of women ranged from 41 to 79, with a median of 63. Most women had their cancer diagnosed in the early stage (83%). Narrative responses included: 1) determinants of health such as biology and family history; 2) social status, including socioeconomic status, race, and neighborhood of residence; 3) individual and family stressors such as discrimination, access to health information, and care quality; and 4) social support, resilience, and physiological responses to treatment. Participants discussed living in different geographic locations in the city, personal safety, and exposure to racism in their communities and workplaces. All were hopeful that sharing their experiences would benefit other cancer survivors. Conclusions: This study demonstrates the importance of examining race, racism, and residential segregation as contributors to breast cancer survivorship. Utilizing narrative analysis and a modified life history calendar, emphasizing residential histories, allows for a deeper examination of women's experiences situated in place. Study findings can inform community-based conversations, advocacy and policy change to reduce disparities.

A062 Intersectionality in cancer health disparities: Rurality, socioeconomic factors, and health resources. [Xi Zhu](#), Amanda R Kahl, Mary E Charlton. University of Iowa College of Public Health, Iowa City, IA, USA.

Purpose: Cancer health disparities are results of complex, intersectional effects of many factors that shape people's exposure and response to disease risks and patterns of health service utilization. We examined the cancer incidence and mortality rates in different types of rural places that were classified based on relevant population and health-resource characteristics. Methods: We developed a taxonomy of rural places using the most recent census, American Hospital Association Survey, Nursing Home Compare, and National Provider Identifier data. Cluster analysis was used to empirically classify US nonmetropolitan counties into distinct

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types of places based on both population characteristics (race/ethnicity, poverty, unemployment rate, health insurance status, and age distribution) and health resources (numbers of primary care physicians, specialists, other providers, staffed hospital beds, skilled nursing facility beds, and average daily census per capita). Surveillance, Epidemiology, and End Results data from 18 cancer registries were used to analyze the differences in 2000-2016 age-adjusted incidence rate (AAIR), late-stage incidence rate, and mortality rate (AAMR) for all cancers and behavior-related cancers (e.g., cancers associated with alcohol use, tobacco use, HPV, physical activity) between urban and different types of rural counties. Principal Findings: Four distinct types of rural places were identified based on four intersecting factors: economic and racial factor, age distribution, healthcare provider resources, and healthcare facility resources. The four types of rural counties included: Type 1 with lower economic resources and more racial/ethnic minority; Type 2 with younger population, higher economic resources, and fewer racial/ethnic minority; Type 3 with older population; and Type 4 with higher healthcare provider and facility resources. Type 1 rural counties had a lower all cancer AAIR (448.7 per 100,000) than urban and other types of rural counties. Urban and Type 4 rural counties had slightly higher AAIR for cancers associated with alcohol use (137.4 and 137.3) and low physical activity (97.4 and 97.0). Type 1 rural counties had higher AAIR for cancers associated with tobacco use (214.1) and HPV (13.2). For late-stage AAIR, Type 1 rural counties had significantly higher rates for all cancers combined (123.7) and for every type of behavior-related cancers. Type 1 rural counties also had a significantly higher AAMR (197.1) than all other types of counties (AAMR ranges between 168.5 and 177.6). Conclusions: Based on relevant population and health-resource characteristics, there appear to be four distinct types of rural places. Rural places that have lower economic resources and more racial/ethnic minority experience higher cancer health disparities reflected in higher incidence rates for certain behavior-related cancers, higher late-stage incidence rates, and higher mortality rate.

A063 Social context and cancer: Stress and quality of life in rural-dwelling Latina cancer survivors. [Rachel M Ceballos](#), Genoveva Ibarra, Monica Escareno, Nora Gonzalez, Nathan Marchello. Fred Hutchinson Cancer Research Center, Seattle, WA, USA.

Introduction: Latina breast and gynecologic cancer survivors (LCS) experience higher levels of distress and lower quality of life compared to non-Latinos. This randomized control trial examined the effect of a promotora-led 10-week Spanish

language support program on levels of stress and cancer-related quality of life (QOL) in LCS. Methods: Fifty-nine LCS were randomized to receive the 10-week intervention (n=30) or to a delayed-intervention control (n=29) group. Measures were assessed at baseline (T1) and upon completion of the intervention period (T2) and included the: short Hispanic Stress Inventory (HSI) [subscales: extra-familial and intra-familial stress]-version 2, the Functional Assessment of Cancer Therapy (FACT-G) QOL scale [subscales: physical (P-QOL), functional (F-QOL), emotional (E-QOL), social (S-QOL)], the FACT-Fatigue QOL scale, and a demographic survey. RESULTS: No statistically significant differences were observed between the intervention and control groups for any of the outcome variables. Perceived stress scale [t(57)=0.37, p=0.72], Hispanic Stress Inventory extrafamilial subgroup [t(57)=1.8, p=0.09], and Hispanic Stress Inventory intrafamilial subgroups [t(57)=1.5, p=0.18]. Results for quality of life subscales were physical [t(57)=-1.66, p=0.10], social [t(47)=-0.32, p=0.75], emotional [t(57)=-0.41, p=0.97], and functional [t(57)=1.38, p=0.17] well-being. Exploratory analyses a mediating effect of extrafamilial stress on a significant relationship between Spanish-only language and lower EQOL. Conclusions: The effect of the promotora-led intervention was not significant. However, an exploratory mediation analyses identified a significant role of extrafamilial (ethnic-based) stress among Spanish-only speakers with EQOL. A detailed presentation of study findings, including a critique of the intervention design and implications for the effect of social context on cancer-related outcomes will be discussed.

A064 Acculturative stress and its relation to deportation fears among adults of Latino immigrants. [Daphne C. Hernandez](#)¹, Omar Guerrero², Jasmine Khademakbari¹, Rosenda Murillo¹, Hua Zhao³, Daniel P. O'Connor¹, Ezenemari M. Obasi¹, Lorna McNeill⁴. ¹University of Houston, Houston, TX, USA, ²Franklin & Marshall College, Houston, TX, USA, ³University of Texas MD Anderson Cancer Center, Houston, TX, USA, ⁴University of Texas MD Anderson Cancer Center, Houston, TX, USA.

Aims. Acculturative stress occurs when an individual has difficulty adapting to new cultural norms in relation to the individual's heritage or maintaining cultural norms of the home country (Berry, 2005). For Latinos, acculturative stress can appear in the form of challenges with speaking Spanish/English proficiently, adapting to American customs, and/or maintaining Latino customs. While acculturative stress has been examined in relation to substance and alcohol use (Cardoso et al., 2016; Goldbach et al., 2015), there is a dearth of research that has examined how acculturative

stress is related to deportation fears, a kind of psychological distress (Arbona et al., 2010). The purpose of this study was to identify the type of acculturative stress that predicts deportation fears among adults of Latino origin. Methods. Self-identifying Latino immigrants between the ages of 21-36 participated in a Houston-area pilot study between August 2018–April 2019 (n=69). Four subscales of the Multidimensional Acculturative Stress Inventory were used to measure acculturation: Spanish competency pressures (7 items), English competency pressures (7 items), Pressure to acculturate (7 items), and Pressure against acculturation (4 items). Items in each subscale were summed with higher scores indicating greater acculturative stress (Castillo et al., 2015; Rodriguez et al., 2015; Rodriguez et al., 2002). Deportation fears were assessed using a 1-item question measuring the anxiety of deportation on a 5-point Likert scale from, not at all worried to extremely worried. This item was created for this study based on immigration stress subscale within the Hispanic Stress Inventory-2 (Cervantes et al., 2016). Descriptive and linear regression models were conducted using STATA v15.0 statistical software (StataCorp LP, College Station, Texas). A series of linear regression models were conducted for each of the 4 acculturative stress subscales and a fifth model was conducted that included all 4 subscales to predict deportation fears. Demographic and socio-economic covariates were included in all models. Results. On average, adults were 29 years of age, 87% female, 62% with a high school diploma or more, and 72% with income of less than \$30,000. Linear regressions findings indicated that greater Spanish competency pressure ($\beta=0.16$, $p<.01$), greater English competency pressure ($\beta=0.12$, $p<.001$), and greater pressure to acculturate ($\beta=0.12$, $p<.001$) each predicted greater deportation fears. In the final model that included all subscales, greater pressure to acculturate ($\beta=0.13$, $p<.001$) was associated with greater deportation fears. Implications. Similar to prior research, pressure to acculturate was associated with a form of psychological distress (Rodriguez et al., 2002). The perception of having different cultural values and practices, over Spanish and English language competency, appear to contribute to greater deportation fears.

A065 US-born Latino adults display greater inflammatory markers than foreign-born Latino adults. Daphne C. Hernandez¹, Omar Guerrero², Rosenda Murillo³, Hua Zhao⁴, Daniel P. O'Connor³, Ezemenari M. Obasi³, Lorna McNeill⁴.

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Aims. The healthy migrant hypothesis suggests that recent Latino immigrants experience better health than earlier arriving immigrants and US-born Latinos (Antecol & Bedard, 2006). Despite their socio-economic disadvantages, it has been suggested that this phenomenon exists because there is a selection process that occurs where the healthiest immigrants migrate to the U.S. Once in the US, the acculturation hypothesis designates that these immigrants maintain positive health-related behaviors associated with Latino cultural values and practices (e.g., dietary practices, avoid smoking and excessive drinking) (Abraido-Lanza et al., 2005). Over time, the health of Latinos declines with the adoption of new beliefs and behaviors (Allen et al., 2014). Although the body attempts to maintain or regulate biological systems (i.e. allostasis), repeated or chronic stress associated with every day stressors, along with minority stress, can activate pro-inflammatory cytokines (Miller et al., 2010). Elevated inflammatory cytokines can be considered early physiological indicators of cancer risk (Dranoff, 2004). The purpose of this feasibility study is examine inflammatory markers in relation to nativity and the number of years in the US. Methods. Self-identifying Latino adults between the ages of 21-36 participated in a Houston-area pilot study between August 2018–April 2019 (n=82). Within this sample, a sub-sample was selected to participate in a blood draw (n=50). A certified bilingual phlebotomist collected a blood sample from each participant using an intravenous blood draw to measure pro- inflammatory cytokines (i.e., IL-6, IL-8, TNF-alpha, and CRP). After the samples were obtained, they will be transported to a local lab where samples were prepared to be assayed using Validated V-PLEX Plus Pro-inflammatory Panel 1 Kits and a V- PLEX Plus Human CRP Kit from Meso Scale Discovery. Participants filled out a survey indicating whether they were US-born or foreign-born. Foreign-born participants also indicated in what year they moved to the U.S. Descriptive statistics were conducted by nativity and number of years in the U.S. (< 10 years vs ≥ 10 years) using STATA v15.0 statistical software (StataCorp LP, College Station, Texas). Results. On average, adults were 29 years of age, 95% female, 68% with a high school diploma or more, and 79% with income of less than \$30,000. Results suggest that US-born Latino adults display higher levels of IL-6, IL-8, TNF-alpha, and CRP compared to foreign-born Latino adults. Among foreign-born Latinos, Latinos who had been living in the US for 10 years or more displayed greater levels of IL-6, IL-8, TNF-alpha, and CRP compared to Latinos who had been living in the US for less than 10 years. Implications. Findings coincide with the healthy migrant hypothesis and the acculturation hypothesis. Results can be used to design a larger scale study aimed at identifying the important behavioral and biological influences on cancer risk, their combined effects, and associated biological pathways.

POSTER SESSION A

A066 Performance of the prostate health index (PHI) assay in black men.

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Introduction: The low specificity of PSA in prostate cancer (PCa) screening has caused excessive biopsies and PCa over-detection. PHI is more specific for clinically significant (cs) PCa (i.e. Gleason >6 PCa) and includes serum PSA, [-2] proPSA, and free PSA in its formula. Validation studies in diverse populations have suggested that PHI should be used as a reflex test and the optimal cutoffs for PHI vary across ethnic groups, but have not been determined in Black men. We sought to 1) assess the distributions of PHI and PSA in healthy controls and men with high-grade PCa and 2) assess the accuracy of PHI vs. PSA for detection of csPCa in Black men with elevated PSA. **Methods:** The present study population consists of two biopsy-naïve cohorts. The first cohort serves as healthy controls and includes Black men with PHI and PSA drawn at community screening events through the social networks of eight lay Black male Citizen Scientists. The second PHI Biopsy Study cohort consists of Black men referred with elevated PSA and/or abnormal digital rectal exam (DRE) who had PHI drawn immediately before prostate biopsy. We excluded men with prior biopsies or known PCa. Distributions of PHI and PSA were compared across controls and men with negative biopsies, Gleason 6 PCa and csPCa. Among men with biopsy, we compared the area under the receiver operating characteristics curves (AUC) for PSA and PHI for detecting csPCa and assessed specificity at selected sensitivities as a proxy of avoided biopsies. We descriptively assessed theoretically avoided biopsies and missed csPCa at previously established PHI cut points [27.0, 28.6, 29.9, and 35.0]. **Results:** For the first objective, 139 men (42.5%) were included as controls from the Citizens Scientist Study and 188 (57.5%) were from the PHI Biopsy Study cohort, out of which 82 (43.6%) had a negative biopsy for PCa, 40 (21.1%) had low-grade PCa, and 66 (35.1%) had a Gleason >6 PCa. Compared to the healthy control group, the PHI Biopsy Study cohort was older (median age 61 vs. 55 years), with higher PSA levels (7.1ng/mL vs. 0.9ng/mL) and PHI scores (61.1 vs. 20.1), and more commonly had a family history of PCa (19.4% vs. 5.0%) and benign prostatic hyperplasia diagnosis (21.3% vs. 2.2%) (all p<0.001). Relative to PSA, PHI has a higher degree of

overlap in the distribution between controls and csPCas (p <0.05), suggesting PHI would not perform well as a primary screening test in Blacks. In men with PSA between 4-10, PHI outperformed PSA in the detection of HGPCa with an AUC of 0.70 (95% CI: 0.59-0.81) compared to 0.57 (95% CI: 0.46-0.69). As a reflex test in men with PSA of 4-10ng/mL and normal DRE, a PHI cutoff of 35.0 would spare 20 (27.8%) low-risk men a biopsy while missing 2 (7.4%) csPCas. **Conclusion:** PHI should not be used for primary screening but has higher accuracy and specificity than PSA in Black men with PSA levels of 4-10ng/mL as a reflex test. At a cutoff of 35.0, 28% of low-risk men avoid biopsy while missing 7% of csPCas.

A067 Oncotype DX assay has similar predictive accuracy for adverse pathology at radical prostatectomy in African American and European American men.

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Objective: To validate the 17-gene Oncotype DX Genomic Prostate Score (GPS) biopsy-based gene expression assay as a predictor of adverse pathology (AP: Pathologic Gleason score $\geq 4+3$, presence of any Gleason 5, and/or $\geq pT3$) in African American (AA) men. **Methods:** Between February 2009 and September 2014, AA and European American (EA) men with very low, low, and intermediate risk prostate cancer (PCa) enrolled in a multi-institutional prospective study of vitamin D impacts of biopsy outcomes. The subset who proceeded to immediate radical prostatectomy (RP) after biopsy with available biopsy tumor blocks was included in a comparative effectiveness analysis of GPS on biopsy and its association with surgical AP on RP using logistic regression and receiver operating characteristic curves. Multiplicative interactions tested for differential prediction of GPS accuracy by race (AA vs. EA). **Results:** Overall, 102 AA and 76 EA men elected RP, out of which 51 (47.2%) had AP. GPS result was a significant predictor of AP (odds ratio per 20 GPS units [OR/20 units] in AA: 4.78; 95% CI 1.8-12.5, P =0.001; and EA: 4.41; 95% CI 1.6-11.9, P =0.003) in univariable analysis. On multivariate analysis, there was a significant interaction between GPS and race (P=0.01). On race stratified binary logistic regression, AP remained significant after adjustment for NCCN risk group in both AA and EA men (OR/20 units in AA: 3.29; 95% CI 1.2-9.1, P =0.02; and EA: 4.24; 95% CI 1.4-12.6, P =0.01). Area under the curves for AP using

GPS/20 units was 0.719 for AAs vs. 0.745 for EAs (P=0.39). Conclusion: In this AA validation study, the Oncotype Dx PCa assay was confirmed as an independent predictor of AP at prostatectomy in AA and EA men with similar predictive accuracy, though there was evidence of effect modification by race.

A068, PR01 The four-kallikrein panel discriminates prostate cancer and aggressive disease in a multiethnic population. [Burcu F Darst](#)¹, Peggy Wan¹, Alisha Chou¹, Emily Vertosick², David V Conti¹, Lynne Wilkens³, Loic Le Marchand³, Andrew Vickers², Hans Lilja⁴, Christopher A Haiman¹.

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Purpose: The four-kallikrein (4K) panel, commercially available as the 4Kscore, has been demonstrated to improve prediction of aggressive prostate cancer (PCa) compared to prostate-specific antigen (PSA) alone or PSA in combination with free PSA. However, the development and testing of the 4K panel has been limited to studies conducted primarily in White men. METHODS: We prospectively evaluated the 4K panel in a nested case-control study among African American (AA), Latino (LA), Japanese (JA), Native Hawaiian (NH), and White (WH) men in the Multiethnic Cohort (MEC). Pre-diagnostic blood levels of free, intact, and total PSA and human kallikrein-related peptidase 2 (hK2) were measured among 2,227 incident PCa cases and 2,189 controls. We used area under the curve (AUC) calculations to compare the discriminative ability of the 4K panel to PSA for overall PCa, Gleason-Grade Group (GGG) 2 or higher, aggressive PCa (Gleason>7, non-localized disease, or death from PCa), and death due to PCa within and across all racial/ethnic groups. RESULTS: The mean ages of the cases and controls at blood draw were 68 (range 47–86) and 69 (range 47–87), respectively, and for cases, samples were drawn an average of 4.9 years prior to their PCa diagnosis (range <1–18 years). For men with elevated PSA (≥ 2.0 ng/ml; 1,669 cases and 663 controls), the AUC for overall PCa was 0.76 (95% CI 0.74–0.78) for the 4K panel compared to 0.72 (95% CI 0.70–0.74) for free plus total PSA and 0.67 (95% CI 0.65–0.70) for total PSA alone. Discrimination was slightly enhanced for the 4K panel for GGG ≥ 2 (1,067 cases; 0.78 for panel versus

0.74 for free plus total PSA and 0.68 for total PSA only) and aggressive PCa (542 cases; 0.79 for panel versus 0.74 for free plus total PSA and 0.68 for total PSA only). Improvement of the 4K panel over total PSA alone was observed in each racial/ethnic group for all four PCa outcomes, most notably for GGG ≥ 2 (AA, 0.71 vs. 0.66; LA, 0.82 vs. 0.71; JA, 0.80 vs. 0.69; NH, 0.90 vs. 0.77; WH, 0.77 vs. 0.69) and aggressive PCa (AA, 0.72 vs. 0.67; LA, 0.81 vs. 0.70; JA, 0.81 vs. 0.69; NH, 0.91 vs. 0.73; WH, 0.77 vs. 0.67). CONCLUSION: The superior predictive ability of the 4K panel over PSA for overall and aggressive PCa across multiethnic populations indicates the broad clinical applicability of the 4K panel.

A069 TRPV6 as a putative genomic susceptibility locus influencing racial disparities in cancer. [Patricia Francis-Lyon](#)¹, Fahreen Malik¹, Xiaoyun Cheng¹, Alireza Ghezavati¹, Feihan Xin¹, Rafiki Cai². ¹University of San Francisco, San Francisco, USA, ²Friends of the Congo, Washington, DC, USA.

It is well established that African Americans exhibit higher incidence, higher mortality, and more aggressive forms of some cancers, including those of breast, prostate, colon, stomach, and cervix. Here we examine the ancestral haplotype of the TRPV6 calcium channel as a putative genomic factor in this racial divide. The minor (ancestral) allele frequency is 60% in those of African Ancestry, but between 1 and 11% in all other 1000 Genomes populations. Recent research on TRPV6 structure/function, its association with specific cancers, and the evolutionary-ecological conditions which impacted selection at its locus are synthesized to provide evidence for the TRPV6 haplotype as a germline susceptibility locus in cancer. Examination of a recently-proposed model for TRPV6 Ca²⁺-dependent inactivation, as it relates to the haplotype SNP identified as the target of selection, is proposed here as an explanatory mechanism for hypothesized failure to inactivate the channel at high Ca²⁺ concentrations in those who have the ancestral haplotype. This could result in an over-abundance of cellular Ca²⁺, which has been implicated in cancer, for those in settings where calcium dietary and supplemental intake is far higher than in their ancestral environment. This synthesis of recent research makes a case for investigation into the TRPV6 haplotype as a genomic factor in cancer disparity. If TRPV6 is found to be implicated, future research would be warranted to improve risk assessment and examine interventions with the aim of improving cancer outcomes for people of African descent.

POSTER SESSION A

A070 Myosin heavy chain 9 (MYH9) is a novel interacting partner of kinesin family member C1 (KIFC1) in African American TNBC: Implications for racial disparity.

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Women of African descent in the United States are twice as likely to develop triple-negative breast cancer (TNBC), compared to women of European descent. African American (AA) women with TNBC present a much more aggressive disease course relative to their European American (EA) counterparts. Thus, there is an urgent need to evaluate race-specific biomarkers and their molecular regulation to improve survival outcome in African American (AA) patients. Kinesin family member C1 (KIFC1), a minus-end-directed microtubule motor protein is involved in centrosomal clustering and chromosomal instability. KIFC1 is highly overexpressed (fold change=1.50, $p=0.000392$) in TNBC relative to non-TNBC. We previously showed that ablation of KIFC1 impaired proliferation and migration of AA TNBC cells to a greater extent than European American (EA) equivalent. Our published data also showed that the weighted index (WI) of nuclear KIFC1 (nKIFC1) is higher in AA TNBC (WI: 154.66 vs. 133.74, AA and EA, respectively, $p=0.036$) and nKIFC1 is an independent poor prognosis biomarker exclusively for AA TNBC patients. While the centrosome clustering role of KIFC1 during mitosis is well-established, its predominant nuclear localization in interphase may underlie its previously unrecognized race-specific association. We and others have shown that nKIFC1 immunoprecipitates with various histones, helicases, and actinins. Immunoprecipitation (IP) of KIFC1 from nuclear fractions of TNBC cell lines followed by mass-spectrometry analysis revealed myosin heavy chain 9 (MYH9), a tumor suppressor protein that stabilizes p53 and promotes its nuclear retention, as the top nKIFC1 binding partner in AA TNBC cell lines (MDA-MB-468 and HCC1806). However, we observed a rather low affinity (rank 5th) or no binding of MYH9 with nKIFC1 in EA TNBC cell lines (MDA-MB-436, HCC1937). Our IP-MS data suggest that a) the relative abundance of MYH9 in nKIFC1 immunoprecipitates is higher in the AA TNBC cell lines and b) MYH9 expression is higher in AA TNBC compared to EA TNBC cells. We hypothesize that nKIFC1 impairs the tumor suppressor function of MYH9 more effectively in AA compared to EA TNBC cells. Intriguingly, KIFC1 immunoprecipitates also showed the presence of beta, alpha-, and gamma actin along with several dead box helicases such as DDX5,

DDX17, exclusively in AA TNBC cell lines, suggesting that a combination therapy regimen of KIFC1 inhibitor (SR31527, CW069, and AZ82) and taxane/anthracycline/platinating agent might be more effective in AA than in EA TNBC cells. RNA seq analyses to identify other KIFC1 partners using KIFC1 knock out using CRISPR-CAS9 approach in AA and EA TNBC cell lines are currently underway.

A071 Characterization of head and neck squamous cell carcinoma from Jamaican patients using p16 immunohistochemistry and HPV polymerase chain reaction in archival formalin-fixed, paraffin-embedded tissues.

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CDKN2A (p16) expression is a well-established prognostic marker and its loss is a common molecular feature in tobacco/alcohol-associated head and neck squamous cell carcinoma (HNSCC). Over the past two decades evidence has also suggested that high-risk human papilloma virus (HR-HPV) infection, which results in overexpression of p16, is implicated in the development of some HNSCC. HNSCC is the sixth most common cancer worldwide and the seventh in Jamaica. Mortality rates for HNSCC in the Caribbean is among the highest in the world. This study will for the first time examine the molecular features of HNSCC as it relates to p16 expression and HPV in patients from Jamaica. There were no previous studies of this kind conducted in the English-speaking Caribbean. Methods: This retrospective cohort study was conducted using archival formalin-fixed paraffin-embedded tissue from patients diagnosed with HNSCC at the Department of Pathology, University of the West Indies, and the National Public Health Laboratory from 2001-2010. Clinical information was extracted for all patients. P16 immunohistochemistry was performed using P16INK4A clone E6H4 mouse anti-human protein and identification of HR-HPV DNA was done by standard PCR using MY09/MY11 consensus primers of the L1 HR-HPV gene. Results: The study population consisted of 326 HNSCC cases with ages ranging from 18 to 92 years (mean, 65 yrs. \pm 15 SD). There were 254 males, 63 females and 9 of unknown sex with M: F ratio of 4:1. The majority of tumors were either moderately differentiated 147/326 (45%) or were poorly differentiated 55/326 (17%). All cases were tested for p16, and the majority 255/326 (78.22%) were negative and 71/326 (21.8%) were positive. All p16+ cases along with a subset of 60 randomly selected p16- cases were tested for HR-HPV by PCR. There were nine p16+ cases which were also positive for HR-HPV DNA. HPV

p16 was detected in all cases, one case had HPV16 and 18, and another had HPV 16, 18, 39, 68 and 73. None of the sixty p16- cases were positive for HR-HPV. The nine patients that were HR-HPV+ and p16+ had a mean age of 61 yrs. \pm 15 SD (range 39-83 years) with a M: F ratio of 8:1. All patients had moderately differentiated tumors, and the majority (78%) of these was from non-oro-pharyngeal sites with predominance in the larynx. Conclusion: In Jamaica, the prevalence of HPV-related HNSCC appears to be low with the majority of patients showing no expression of p16 and diagnosed in older individuals. Based on what is known in the literature, our study results suggest that in Jamaica most patients are diagnosed with alcohol and tobacco driven disease. The role of HPV in HNSCC warrants further investigation in this population.

A072 Polyethnic-1000: Advancing cancer genomics by studying ethnically diverse, underserved patient populations in New York. Benjamin Hubert¹, Fieke Froeling², Kanika Arora¹, Tim Chu¹, Nicolas Robine¹, Michael Zody¹, Dayna Oschwald¹, Harold Varmus³, Charles Sawyers⁴, David Tuveson². ¹New York Genome Center, New York, NY, USA, ²New York Genome Center/Cold Spring Harbor, USA, ³New York Genome Center/Weill Cornell Medicine, USA, ⁴New York Genome Center/Memorial Sloan Kettering Cancer Center, USA.

Background and aims Advances in sequencing technologies have revolutionized our approaches in medicine. However, our current knowledge about the molecular attributes of cancer has primarily been derived from patients of European descent. The overall aim of Polyethnic-1000 is to bring genomic innovation to under-represented ethnic groups in the diverse patient population of New York City. Methods and results A dynamic research platform is being created, involving the New York Genome Center and academic centers and partnering hospitals in the New York City region. In a first, retrospective stage, the infra-structure, sample workflow, analysis and data sharing within the consortium has been developed and whole exome and RNA sequencing has been performed on 100 samples from self-identified non-white cancer patients treated at 14 different centers. Data from over 24 tumor types were shared with our collaborators and the somatic variants were made available through our in-house instance of cBioPortal. The knowledge gained during this stage is used to design a prospective study with formation of cohorts of interest for particular cancer types and particular ethnicities, with uniform consent allowing germline and somatic sequencing with broad data sharing of the somatic variants identified. Conclusion By establishing

a collaborative network, Polyethnic-1000 will deepen our understanding of the contributions that ethnicities make to the incidence and biology of cancers, potentially improving outcomes for patients who currently lack access to the most recent advances in medical science.

A073 TGF-beta receptor type-2 expression regulates breast cancer progression and is a prognostic marker for racial disparities. Alakesh Bera¹, John Karaian¹, Harvey B Pollard¹, Hai Hu², Craig D Shriver³, Meera Srivastava¹. ¹Uniformed Services University, Bethesda, MD, USA, ²Chan Soon-Shiong Institute of Molecular Medicine, Windber, PA, USA, ³Murtha Cancer Center, Uniformed Services University/Walter Reed National Military Medical Center, Bethesda, MD, .

Transforming growth factor β (TGF β) is one of the most important signaling pathways associated with cellular proliferation, and its dysregulation can lead to tumor development. TGF β can act as either a tumor suppressor or a tumor promoter depending upon the cellular context and genetic alterations. TGF β receptor type-2 (TGF β R2) is the ligand-binding receptor, and data shows that the aberration of TGF β R2 is associated with many different cancers including colon, gastric, biliary, pulmonary, and ovarian cancers. In this study, we focused on uncovering the functional role of TGF β R2 in regulating breast cancer (BrCa) progression. First, we analyzed the genomic alterations of TGF β R2 in a sample set from The Cancer Genome Atlas (TCGA, n=1084) on the cBioportal platform. We focused on obtaining genetic modifications, including mutations and copy number alteration. Data indicated that almost 25% of the patient's samples having TGF β amplified copy number; however, only less than one percent patients have amplified copy of TGF β R2 and other TGF β receptors, within across this sample set. Next, we have screened the level of TGF β R2 protein expression in different BrCa cell-lines. We found that the elevated level of TGF β R2 is associated with the most aggressive triple-negative MDA-MB-231 cells. It is also found that the TGF β R2 is secreted into extracellular space. Therefore, we next evaluated the expression level of TGF β R2 in patient's serum samples. We have well defined and categorized BrCa patients serum samples (n=240) from the Clinical Breast Care Project led by Walter Reed National Military Medical Center, Bethesda. The differential expression level of TGF β R2 in serum indicated that the elevated level of TGF β R2 is associated with BrCa patients compared with healthy individuals. Furthermore, the serum level of TGF β R2 is higher in the African American patient population when compared to Caucasian patients, and most significant differences were found within Luminal B1 sub-

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type BrCa cases. To better understand the mechanism of the higher level of TGF β R2 protein expression, in association with aggressiveness, we hypothesized that increased levels of TGF β ligand are inducing the expression of the receptor (TGF β R2) and eventually stimulating the oncogenic pathway. We have used a series of BrCa cell lines and incubated them with different concentrations of TGF β ligand. The level of TGF β R2 protein was increased in BrCa cell lines after TGF β ligand treatment. Increased levels of TGF β 2 ligand induces the expression of the relevant receptor. In summary, we quantified the expression levels of TGF β R2 in patients' serum samples, which can be used to create a set of stage and race-specific candidate protein biomarkers for BrCa. We also found that the increased level of TGF β ligand-induced the expression of the TGF β R2 receptor. We can also conclude that TGF β R2 is an important biomarker and possibly plays a role in racial disparities in breast cancer progression.

A075 Lifestyle-associated metabolites drive neuroendocrine differentiation in prostate cancer. [Ashley E. Knowell](#)¹, Lourdes M Nogueira², Taiwo Biotidara¹, Brandon Sutton³, Arabia Satterwhite¹, Michael Lilly², Shanora Brown¹, Dave Turner², Victoria Findlay². ¹South Carolina State University, Orangeburg, SC, USA, ²Hollings Cancer Center-Medical University of South Carolina, Charleston, SC, USA, ³South Carolina State University, Orangeburg, SC, USA.

Prostate cancer affects African American (AA) men disproportionately in the US, but even more so in the state of South Carolina, with 3 times higher mortality rates for AA men when compared to European American (EA) men. Neuroendocrine prostate cancer (NEPC) is a subtype of castrate resistant prostate cancer with aggressive clinical features and poor overall survival. NEPC is associated with androgen independence and a lack of therapeutic options. Although de novo NEPC is rare, recent studies support the idea that transformation of prostate adenocarcinoma cells through a process of neuroendocrine differentiation (NED) into NEPC as a mechanism of resistance to androgen receptor-directed therapies (ADT). The investigators have identified a lifestyle factor known as advanced glycation end-products (AGEs) that promote a more aggressive prostate cancer phenotype through the induction of a specific microRNA (miR-204) and MYC (a known driver of NEPC). The role of miR-204 in prostate cancer was considered controversial with some groups reporting a tumor suppressor and others an oncogenic role. More recent studies now show that miR-204 plays an oncogenic role in AR negative cells representing NEPC and as a tumor suppressor in AR positive cells representing prostate adenocarcinoma. We

show that AGEs upregulate miR-204, MYC and drive NED in vitro and drive aggressive tumor growth in vivo. Relevant as both AGEs and miR-204 are elevated in AA men, when compared to EA men, with prostate cancer. We also show that inhibition of miR-204 can inhibit the neuroendocrine phenotype, including the downregulation of MYC. This innovative study is the first to link a lifestyle factor (AGE) and a plasma biomarker (miR-204) together as drivers of racial disparities in prostate cancer aggression, and as drivers that can be clinically targeted and may be informative for novel therapeutic interventions to delay or prevent the emergence of NEPC during ADT. Work supported by NIH/NCI Project #1U54CA210963

A076 Mechanistic pathways and novel prognostic indicators of lifestyle intervention outcomes for African American breast cancer survivors. [Jessica Olson](#)¹, Patricia Sheehan², Giamila Fantuzzi³, Lisa Sharp³, Melinda Stolley¹. ¹Medical College of Wisconsin, Milwaukee, WI, USA, ²Loyola University, Chicago, IL, USA, ³University of Illinois at Chicago, Chicago, IL, USA.

Background: For African American (AA) women in the US, breast cancer (BC) is the leading cancer diagnosis and the second leading cause of cancer death. The rising prevalence of obesity and related comorbidities are important contributors to widening racial disparities in BC outcomes. 82% of AA women are obese or overweight, compared to 64% of Non-Hispanic White (NHW) women. BC mortality rates are 40% higher in AA women, and incidence rates surpassed NHW women in 2013. Obesity is linked to poorer BC outcomes through upregulation of leptin, cytokines, and hormone expression. Conversely, weight loss and/or increased physical activity decrease inflammation and estrogen expression, decrease cellular growth factor signaling and angiogenesis, increase antitumor immunity, and reduce overall BC risk. Methods: Between 2011 and 2014, 246 AA breast cancer survivors were recruited and randomized to either the Moving Forward interventionist-guided or self-guided weight loss program. Results showed significant weight loss, improved diet, increased physical activity, and increased social support. In addition to collecting anthropometric and behavioral data, the study team banked serum samples for the majority of participants at baseline, six months (post-intervention) and twelve months (follow-up). For all samples, weight loss outcomes were recorded, and potential biomarkers were explored between groups. Results: Interventionist-guided study participants exhibited greater improvements than self-guided control participants for weight loss (-3.49kgs vs -1.27kgs, $p = <0.0001$) and %

weight loss (3.6% vs 1.4%, $p = 0.001$). Among all participants, those losing >5% of their body weight showed significant improvements in leptin (65.6 ± 28.3 vs. 45.0 ± 23.3 at baseline and 6 months, respectively, $p = <0.0001$) and c-peptide (805.3 ± 470.6 vs. 632.3 ± 453.4 at baseline and 6 months, respectively, $p = 0.0001$). Planned studies will utilize RNA sequencing approaches to fully elucidate the role of non-coding RNAs in lifestyle intervention outcomes. Conclusions: Early changes in triglycerides, leptin, and HbA1c are detectable in participant serum samples and are likely linked to alterations in body composition, inflammatory cytokines and mitochondrial bioenergetics. Our future directions for this study are completely novel in their use of next generation sequencing to examine noncoding RNA-mediated mechanisms of reduced breast cancer risk, and the first to focus specifically on outcomes of lifestyle intervention in AA women.

A080 Associations between quantitative measures of TDLU involution and breast tumor molecular subtypes among breast cancer cases in the Black Women's Health Study.

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Background: Terminal duct lobular units (TDLUs) are the structures in the breast that give rise to most breast cancers. Previous work has shown that TDLU involution is inversely associated with TDLU metrics, such as TDLU count/100mm², TDLU span (μm), and number of acini/TDLU, and that these metrics may be elevated in the background normal breast tissue of women diagnosed with triple-negative (TN) compared with luminal A breast tumors. However, it is unknown if this relationship exists in black women, who have the highest incidence of TN breast cancer as well as the highest overall breast cancer mortality rate. We sought to determine the relationships of quantitative measures of TDLU involution with breast cancer molecular subtype among participants in the Black Women's Health Study. **Methods:** We digitized hematoxylin and eosin stained normal adjacent tissues from TN (estrogen receptor negative (ER), progesterone receptor negative, and human epidermal growth factor 2 (HER2) negative; $n=67$) and luminal A (ER positive and HER2 negative; $n=162$) breast cancer cases from the Black Women's Health Study. We used logistic regression to evaluate associations between TDLU metrics and breast cancer subtype (TN vs. luminal A), with adjustment for age and body mass index. We performed ordinal logistic regression to evaluate relationships between population and

clinical characteristics and TDLU metrics. **Results:** Among the 229 breast cancer cases, mean age at diagnosis was 53.7 years; 68.7% of TN and 54.3% of luminal A cases were under 55 years of age. Most women had a body mass index (BMI) >30kg/m², were parous, did not smoke, and did not have a family history of breast cancer. The odds of TN breast cancer were elevated for the second and third tertiles of TDLU count relative to the first tertile, with odds ratios (95% confidence interval) of 2.89 (1.11, 4.86) and 1.92 (0.93, 4.08), respectively. Similarly, the odds of TN breast cancer increased with increasing tertiles of median TDLU span, with odds ratios of 2.25 (1.06, 4.91) and 2.38 (1.14, 5.15) for the second and third tertiles, respectively, compared to the first tertile. These associations persisted even after adjustment for age and BMI. No association was observed with median acini count/TDLU and TN breast cancer. We also observed significant associations of some breast cancer risk factors with measures of TDLU involution. Higher TDLU count was associated with younger age, more physical activity, lower BMI, current use of oral contraceptives or menopausal hormones, and premenopausal status. **Conclusion:** The associations of TDLU metrics with breast cancer subtype observed in this population of black women are consistent with previous studies of white and Asian women, with reduced TDLU involution in TN breast cancers compared with luminal A. Further investigation is needed to understand the factors that influence TDLU involution and the mechanisms that mediate TDLU involution and breast cancer subtype.

A081 Using the Arkansas State-Wide Health and Nutrition Examination Survey to understand metabolic health among healthy African-American and White smokers and non-smokers.

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Introduction. African-Americans (AAs) have a higher smoking-attributable cancer mortality than any other racial/ethnic groups in the United States and in Arkansas. Cigarette smoking prevalence among adults in Arkansas is the 5th highest (22.3%) and smokeless tobacco (ST) use is 3rd highest in the nation (7.8%). Use of tobacco products, poor nutrition, as well as obesity, have been indicated as major risk factors for various cancers and other chronic diseases. Few studies have examined state-specific metabolic biomarkers representing the status of metabolism among smokers and non-smokers in Arkansas and among racial/

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ethnic groups. The purpose of this study was to compare the differences in markers of dietary lipids and metabolic health in blood among healthy AA and non-Hispanic white (NHW) adult smokers and non-smokers. **Methods.** Data were analyzed using the 2008 Arkansas Cardiovascular Health Examination Survey (ARCHES, n=1,385), a survey that used probability sampling methods to obtain a representative sample of Arkansas residents, and the analytical sample was limited to adults with no history of cancer or chronic diseases such as diabetes (n=769). Two-way ANCOVA was used adjusting for age and sex to determine the differences in biomarkers among four groups: non-smokers (n=587, 76.3%), current cigarette smokers (n=130, 16.9%), and current smokeless tobacco users (n=21, 2.7%), and dual users of any two tobacco products (n=21, 2.7%). P-value less than 0.05 was considered significant. **Results.** Of the 769 adult participants, 25% were AA and 75% were NHW. Nearly 31% were male and the mean age was 52.0 (SD=14.8) years. AA non-smokers had a significant higher BMI (mean 34.1, SD=7.9; NHW mean 29.5, SD=6.3), higher markers of fasting glucose (mean 110.0, SD=64.4; NHW mean 95.6, SD=28.3), fasting insulin (mean 28.3, SD=27.8; NHW mean 20.9, SD=32.8), and levels of dietary fats than NHWs. NHW non-smokers had a higher LDL (mean 124.9, SD=33.4; AA mean 115.5, SD=35.6) and triglycerides (mean 177.3, SD=116.7; AA mean 143.7, SD=107.8) than AA non-smokers. NHW cigarette smokers had significant higher levels of triglycerides than AA smokers. AA smokers had higher blood pressure, trans-fat than NHWs. NHW ST users had higher pulse rate than AA ST users. AA dual users had higher BMI and dietary fats than NHWs. **Conclusions.** Our results indicate poorer metabolic health among AAs compared to white adult non-smokers, smokers, and ST users. However, differences varied by tobacco use type and for some indicators, there were no differences between racial/ethnic groups potentially due to small sample sizes. Larger and more recent studies including dual use of different products are needed in Arkansas to understand the health burden among tobacco user.

A082 ENACT: A randomized trial assessing the impact of the Oncotype DX Prostate Cancer Assay on treatment decision in a racially diverse population of men eligible for active surveillance. Adam B Murphy¹, Samuel Carburanu¹, Michael Abern², Courtney MP Hollowell³, Roohollah Sharifi⁴, Peter H. Gann². ¹Northwestern University Feinberg School of Medicine, Chicago, IL, USA, ²University of Illinois at Chicago School of Medicine, Chicago, IL, USA, ³Cook County Health and Hospitals System, Chicago, IL, USA, ⁴Jesse Brown VA Medical Center, Chicago, IL, USA.

The Oncotype DX Prostate Cancer Assay[®] (ODX), a 17-gene expression profile performed on biopsy tissue, has been validated for prediction of adverse pathology at surgery and 10-year risk of metastasis or death. The assay output provided to the patient and clinician is a predicted probability. While these studies confirm the ability of the assay to discriminate indolent from aggressive prostate cancer (PCa), the assay's actual clinical utility, in terms of its impact on treatment choice and psychological factors, has not been determined. Moreover, the assay's utility for African American (AA) men remains an important knowledge gap for programs aimed at reducing PCa disparities through judicious use of active surveillance (AS). ENACT (Engaging Newly Diagnosed Men About Cancer Treatment Options) is an ongoing randomized trial comparing standard National Comprehensive Cancer Network (NCCN) based treatment counseling plus ODX to NCCN-based counseling alone for a largely AA population of men eligible for AS. The primary aim is to quantify the effect of ODX on treatment, testing the hypothesis that the assay causes a net migration towards AS. Secondary aims measure effects on psychological metrics dealing with cancer-related anxiety, decision conflict, and decision regret. Completion of the trial is expected in Fall 2019. Patients are enrolled at the UI Hospital, Stroger-Cook County Hospital and the Jesse Brown VA Medical Center in Chicago. Eligibility criteria include: biopsy-proven PCa with NCCN risk level Very Low, Low or Low Intermediate, age ≤ 76, and estimated life expectancy >10 years. Thus far, 201 patients have enrolled and 180 have completed all study visits. Randomization (stratified by race and NCCN risk) occurs at Visit 1, when patients receive their diagnosis and initial counseling, and treatment decision is finalized at Visit 2, 2-3 weeks later. At Visit 3, ≈4 weeks after the decision but before treatment, surveys capture information about decision conflict and changes from Visit 1 in perceived cancer-related risk/mood. At Visit 4, ≈4 months after treatment starts, final surveys capture data on regret and evaluation of the decision process. Additional surveys record treatment preference of the attending urologist before and after the final decision. The enrolled population thus far is 71% AA, 35% age <60, and 42% NCCN Very Low risk, 33% Low risk, and 25% Low Intermediate risk. Drop-out for the primary endpoint is <5%. The data analysis will explore potential effect modification by race, risk level, health literacy, marital status, and relative vs. absolute change in predicted risk. The unique design of the ENACT trial raises questions about the need to evaluate predictive biomarkers, which are decision support tools, based on their actual impact on decision quality, especially for patients affected by a racial disparity in outcomes. The advent of multiplex biomarkers that provide clinicians and patients with probabilities rather than binary results adds to the complexity and the urgency of this need.

A083 Detection of personalized oncogenic risk after genotoxic exposures. [Paul Okunieff](#), Steven B Zhang, Zhenhuan Zhang, Steven G Swarts, Natalie A Lockney, Katherine Casey-Sawicki, Sadasivan Vidyasagar. University of Florida, Gainesville, FL, USA.

Purpose: Despite reduced sensitivity to sun exposure, many Black patients treated with ionizing radiation appear to experience increased skin toxicity as compared to White patients. The cause is unknown, yet some studies have suggested that DNA repair is reduced in these patients. Therefore, we developed a technology to examine organ-specific differences in mutation rate after irradiation. In this study, we demonstrate the feasibility of personalized quantitative measurements of single base errors in DNA using a saline skin swab after irradiation. We believe this technology will have the potential to identify patients at higher risk for skin toxicity and, therefore, for whom preventative measures are most important. Methods/Results: We have developed a method for quantification of point mutations using xeno-DNA clamps. This method exceeds the theoretical limit for quantitation of base errors using standard deep-gene sequencing by several orders of magnitude. It can be performed on an organ-specific basis with less than 1 ng of DNA (≈ 100 cells). We have developed both a mouse and a human clamp set. Measurements of mouse organs, including the liver, brain, skin, spleen, and small bowel, were performed before and at various times after irradiation (0.5 to 10 Gy). Human cell culture studies parallel the mouse studies, and human clinical trials are underway using cotton swabs of skin and oral mucosa. The brain is highly efficient at damage repair, whereas mature lymphocytes repair poorly; epithelial cells (GI and skin) have intermediate accumulation of mutations after irradiation. Mutation accumulation can be higher at a low dose and does not monotonically increase with dose. Conclusions: Our xeno-DNA clamp methodology can easily, inexpensively, and quantitatively measure incremental point changes in the non-coding silent DNA that makes up 98.5% of the human genome. The test is ready for clinical application and a clinical trial is beginning in Black and White patients with head and neck cancers. Preliminary data will be presented.

A084 Personalized prediction of radiation sensitivity. Natalie Lockney, Steven G Swarts, Jennifer Li, Christopher Morris, Randal Henderson, Steven B Zhang, Zhenhuan Zhang, Sadasivan Vidyasagar, Reshu Gupta, Katherine Casey-Sawicki, Robert Zlotecki, [Paul Okunieff](#). University of Florida, Gainesville, FL, US.

Purpose/Objective: Patients of different races with similar cancers are often treated with radiation according to safety criteria largely collected from patients of European origin. However, even among those patients, toxicities are not predictable. Patients of African origin appear to have more severe skin radiation reactions, particularly Black women with breast cancer, than other populations. We have developed a technique using circulating cell-free DNA (cfDNA) that appears to predict toxicity in patients with otherwise similar radiation dosimetry, allowing for early intervention to prevent side effects (marketed as RadTox™, DiaCarta, Inc.). Methods: Pre-clinical studies were performed in mice with white (BALB/c), brown (C3H/HeJ), or black (C57BL/6) fur. Radiation was delivered to the hind limb, and the skin reaction was evaluated. Blood was collected to evaluate changes in cfDNA as compared to severity of cutaneous toxicity. A phase I/II clinical study (n=54) was also performed to determine if plasma cfDNA measured early in a radiotherapy course can predict the subset of patients who experience grade 2 or higher radiotoxicity. Results: The most severe toxicity was seen in the C57BL/6 mice, and at similar doses the increase in cfDNA was higher than in the other two strains. Fifty-four patients were evaluable for the clinical study. Radiation significantly increased cfDNA on all days following the first radiation session. Acute maximum GI toxicity score, but not acute GU toxicity, was significantly correlated with cfDNA levels obtained on days 1, 2, 3, 4, and 5 of radiotherapy ($p < 0.005$). Conclusions: Plasma cfDNA levels predicted the mouse strain that experienced more severe toxicity, and in a small study detected acute bowel toxicity. A larger study is needed to confirm the results and the value of the test for identifying patients who need special interventions to reduce toxicity. Further testing of this hypothesis is under evaluation in an NCI-funded multi-institutional study.

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A085 Common and unique breast and prostate cancer metabolic profiles in African Americans. Delisha A. Stewart¹,

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Breast cancer (BCa) and prostate cancer (PCa) are two of the most commonly occurring invasive cancers in African American women and men, respectively. Although they arise in anatomically different organs with distinct physiological function, a unique feature of both cancers can be hormone-dependence and thus, remarkable underlying biological similarity has been observed between the two malignancies. For example, increased risk of male BCa after PCa incidence was reported previously, in a large population-based study. The purpose of this study was identification of biomarkers to improve early diagnosis in African Americans, leveraging metabolic commonalities and differences between these two cancers. Using untargeted ¹H nuclear magnetic resonance (NMR) metabolomics we identified several common and unique metabolites and biological pathways in plasma samples from BCa and PCa patients compared to plasma samples from women and men with no diagnosis or family history of either type of cancer (controls). Samples were provided from the Tissue, Plasma and Clinical Bank at the Howard University Cancer Center (HUCC). Multivariate analysis demonstrated greater differentiation in the metabolic profiles between control plasma samples for both men and women, with an increase in the level of some amino acids (e.g. alanine, N-acetyl-tyrosine, asparagine, glutamine, histidine, tryptophan and tyrosine), but no differences between short chain fatty acids (2-hydroxyisovalerate, β -hydroxybutyrate). The analysis between BCa and PCa plasma profiles showed similar results. Comparison between control women versus BCa patients demonstrated decreases in all library-matched, significant metabolites except for increases in β -hydroxybutyrate and formate in patients. Analysis of control men and PCa patients showed increased levels of most amino acids but decreases in short chain fatty acids. Interestingly, pathway evaluation showed decreased glucose utilization in comparisons between both sets of control samples and cancer samples, individually, but no difference between controls versus cancer samples. Metabolically-relevant markers can serve as a viable means for earlier cancer detection, to have a major impact on cancer outcomes for African Americans, who suffer disparate burdens from these cancers, in-part because of delayed

diagnoses and poor treatment efficacy associated with later-stage disease.

A086 Leveraging surface Hsp90 expression as an enhancement to breast cancer diagnosis at the point-of-care. Roujia Wang, Daniel Alvarez, Christopher Lam, Brian Crouch, Philip Hughes, Timothy Haystead, Nimmi Ramanujam. Duke University, Durham, NC, USA.

Histology serves as the gold standard for breast cancer diagnosis for more than 75 years; however, it requires multi-step sample preparation and labor-intensive analysis, which is not ideal for low resource setting. We are seeking alternatives to traditional histology by developing a simple molecular imaging platform that can quickly analyze patient's samples and provide a molecular signal to reflect disease pathology. Heat shock protein 90 (Hsp90) is identified as a biomarker to diagnose breast cancer as it is overexpressed on the surface of all breast cancer cell subtypes to orchestrate stress response to cancer formation. Based on this feature, we establish a non-invasive and rapid molecular imaging approach to quantify Hsp90 expression on breast biopsies using a FITC tethered Hsp90 inhibitor (HS-27) that binds to surface Hsp90 of breast cancer cells. A wide-field, high resolution, handheld fluorescent microscope, the Pocket Mammoscope, has been developed to perform rapid non-contact Hsp90 fluorescent imaging of entire tissue biopsies at point of care. The Pocket Mammoscope uses a concentric excitation blue LED source (470 \pm 20 nm) a band-pass emission filter (534 \pm 26nm) for HS-27 fluorescence emission and a CMOS detector for imaging. It is capable of 3-52X magnification and can perform both wide-field (FOV: 35-mm; resolution: 24.8 μ m) and high-resolution (FOV: 8.5 mm; resolution: 8.77 μ m) reflectance imaging by changing the working distance using a user-controlled slider mechanism on the body of the scope. The Pocket Mammoscope can achieve fluorescent imaging with dual imaging mode, which will allow us to image one core needle biopsies (CNBs) in one snapshot using the wide-field mode and zoom in to the regions of interest using a high-resolution mode. In our pilot clinical studies, we also demonstrated the feasibility of using the Pocket Mammoscope for Hsp90 fluorescent imaging on patient CNBs. We showed that HER2+ receptor subtype biopsy has significantly higher HS-27 signal compared to benign breast tissues. To examine the sensitivity and specificity of Hsp90 imaging, we used features from the image in a Gaussian support vector machine (GSVM) classifier. A Receiver Operating Characteristics (ROC) curve shows specificity (100%) and sensitivity (86%) of Hsp90 for distinguishing malignant tumor biopsies (n = 27) from benign biopsies (n = 10). Our preclinical study also discovers

the correlation between unspecific signal and decreased cell viability in vivo and ex vivo ($p < 0.05$, $n = 5$). We establish diffusion kinetics of HS-27 probe in ex-vivo breast tissue by quantifying the diffusion coefficient ($11.55 \pm 3.63 \times 10^{-7} \text{cm}^2/\text{sec}$) and 1-minute staining penetration depth ($366.75 \pm 46.96 \mu\text{m}$). Based on this finding, we will further optimize our Hsp90 staining protocol as a way to improve sensitivity. By integrating optimized staining protocol with Pocket Mammscope, our diagnostic platform could ultimately serve as an alternative to traditional pathology at a point-of-care setting.

A087 Spatial RNA-seq reveals intratumor heterogeneity and transcriptional substructure in a diverse cohort of high-grade ovarian cancers.

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Introduction: Differences in tumor heterogeneity, particularly the tumor microenvironment have not yet been explored as potential molecular features underlying cancer disparities. Molecular profiling of bulk tissue specimens using methods such as whole-transcriptome sequencing are limited in their ability to resolve fine grain molecular signatures and hinder our utility to dissect underlying biology of individual tumors. Although informatics approaches are available that attempt to disentangle tissue heterogeneity from bulk tumor data, emerging spatial whole transcriptome sequencing technologies allows a more precise delineation of cellular and molecular substructure in a comprehensive unbiased way. Here we present an investigation whole-transcriptome spatial sequencing in a diverse cohort of ovarian cancer cases. **Methods:** Three serial 5-micron frozen sections were placed on proprietary 10x Genomics Spatial Transcriptomics (ST) slides and processed using manufacturer specifications. Libraries were sequenced on the Illumina NovaSeq 6000 system and data was processed using the 10X Genomics analytical tools. ST data from each section was analyzed to create spatially defined cellular clusters at 100-micron resolution. **Results:** ST revealed cellular heterogeneity across the entirety of the tumor microenvironment in an anatomically resolved manner. Bioinformatic tools and molecular pathways to infer tumor purity were used to annotate tumor, immune, and stromal substructures. These data also revealed clear transcriptional substructure in some tumors, where different tumor regions were defined by unique gene sets associated with different molecular

processes known to be related to tumorigenesis. Further, we observed clear transcriptional substructure in some tumors, where different tumor regions were enriched with molecular pathways that are associated with tumorigenesis (i.e., DNA Damage Response, and Protein Translation pathways), regions defined by immune infiltration (i.e. CD8+ T cells, T regulatory cells, Macrophages, and B cells), and molecular pathways that are associated with inflammatory signalling (i.e. complement, IL2, IL-10, and IL6 signaling pathways). **Conclusion:** These approaches highlight the power of spatial whole-transcriptomic approaches in solid tumor studies to help unravel the complexity of heterogeneous cancers and provide a comprehensive characterization of transcriptional substructure within a single tissue section.

A088 Centrosomes take center stage: Comparative analysis of centrosome amplification in African American and European American patients with prostate cancer.

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Background: Prostatic adenocarcinoma (PCA) in African Americans (AA) is characterized by earlier onset, higher aggressiveness, more frequent metastases, and increased mortality rates compared to those in European Americans (EA). Exome and genome sequencing have revealed that PCA in AAs also exhibits high intratumor heterogeneity (ITH) than their counterparts in EAs. ITH poses challenges to both clinicians and drug developers when identifying low-level clones, predicting tumor evolution, developing clone-specific targeted drugs and evaluating effective, yet non-toxic combinatorial regimens to combat ITH. Amplified centrosomes (an abnormal increase in the number and/or volume of centrosomes) underlie erroneous mitoses and fuel chromosomal instability (CIN), which is a well-recognized driver of ITH. In this study, we evaluated the extent of centrosome amplification in tissue sections from PCA in AA and EA men. **Design:** We have pioneered a semi-automated pipeline that integrates immunofluorescence confocal microscopy with digital image analysis and yields a quantitative Centrosomal Amplification Score (CAS) for each tumor sample by evaluating severity and frequency of centrosomal aberrations therein. To this end, 115 formalin fixed paraffin embedded PCA tissue sections were firstly immunofluorescently stained for centrosomes followed by imaging and image analysis. Finally, we generated a composite CAS score (CAS_{total}) for each patient sample by integrating the numerical (CAS_i) and structural (CAS_m) aberrations. **Results:** High BMI (>25) AA PCAs ($n = 37$)

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exhibited significantly ($p=0.04$) higher CAStotal than EA ($n=41$) regardless of Gleason grade. Moreover, on analysis of grade matched PCAs we observed that CASm and CAStotal were significantly higher ($p=0.02$) in high grade (Gleason score >7) in AA PCAs ($n=34$) when compared to EA ($n=38$) PCAs. Regardless of race tumors from men > 54 years exhibited higher CAStotal ($p=0.03$) (high age group $n=86$ and low age $=29$). Conclusion: Our results suggest that AAs exhibit higher degree and severity of CA compared to EAs, which may render PCAs in AAs more sensitive to centrosome targeting/declustering drugs. This study suggests the potential usefulness of CAS in enabling patient stratification into more optimal treatment regimens and provides a novel tool that might help in personalized prostate cancer treatment with an overall goal of eliminating ethnic disparities in prostate cancer outcomes.

A089 Detection of circulating tumor cells (CTC) by microfluidic technology based on lateral magnetophoresis and CTC-based multigene profiling analysis in prostate cancer patient. [Hyungseok Cho](#)¹, Ki-Ho Han¹, Jae-Seung Chung². ¹INJE University, Gimhae, Republic of Korea, ²INJE University, Haeundae Paik Hospital, Busan, Republic of Korea.

Introduction By using the circulating tumor cells (CTCs), we can get useful genomic information that enable monitoring of patient's prognosis or selecting of appropriate treatment over time by repeat biopsy. Despite their usefulness, current CTC separation techniques are limited in terms of their ability to separate high recovery and purity CTCs from peripheral blood. We aimed to separate CTCs from prostate cancer patients using microfluidic technique that based on disposable lateral magnetophoretic microseparator (named 'assembly-disposable CTC- μ Chip') and assess the gene expression that are specific for prostate cancer using mRNA from isolated CTCs measured by droplet digital PCR (ddPCR) method. **Patients and Methods** Total 54 samples of 45 patients who underwent treatment for prostate cancer between 06/2018 and 03/2019 were prospectively enrolled for CTC collection. Approximately 10 ml of whole blood was drawn from prostate cancer patients; Group A, 12 samples (22.2%) with localized stage II-III cancer, Group B, 5 samples (9.3%) with stage IV, Group C, 6 samples (11.1%) with metastatic hormone-sensitive prostate cancer (mHSPC) and Group D, 31 samples (57.4%) with metastatic castration-resistant prostate cancer (mCRPC). CTCs were positively isolated by using Assembly-disposable CTC- μ Chip. CTCs from 5 mL of blood were used for counting to identify isolated CTC numbers with immunofluorescence detection procedure. CTCs from the remaining 5 mL of blood were

used for gene analysis by ddPCR. For the gene expression analysis, selected 13 patient's samples were examined for 6 prostate cancer-related genes, such as androgen receptor (AR), androgen receptor splice variant 7 (AR-V7), prostate specific membrane antigen (PSMA), prostate specific antigen (PSA), cytokeratin-19 (CK-19) and epithelial cell adhesion molecule (EpcAM). **Results** We identified the average of 3, 16, 14 and 26 CTCs per 1ml in group A, B, C and D, respectively ($P < 0.01$). Background contaminated white blood cells are indispensably isolated with CTCs that counted on average 2245.4 cells, thereby CTC purity rate was 2.56 %. The gene positive rate of AR, AR-V7, PSA, PSMA, KRT-19, and EpCAM were 2.3 % (12/13), 15.4 % (2/13), 38.5 % (5/13), 69.2 % (9/13), and 100 % (13/13), respectively. Especially, the copy number of PSA, PSAM and CK-19 increased in proportion as the clinical stage increased. All samples showed EpCAM positive, whereas AR-V7 was rare events, with only in 2 out of 5 patients positive with mCRPC, but not in other stages. **Conclusions** This study demonstrates that assembly-disposable CTC- μ Chip is a suitable for CTC isolation from prostate cancer patients. Our data also showed that CTC-based multigene profiling can be analyzed using ddPCR, making it a clinically relevant biomarker. Interrogating tumor expression via CTCs isolation may allow for enhancing precision-based treatment.

A090 Community partnerships expand access to tumor molecular profiling. [Thomas Reynolds](#)¹, Kellie Jack¹, Margaret Kemeny², Linda Bulone², Jason Gonsky³, Lewis J. Kampel¹, David Hyman¹, David B. Solit⁴, Claire Conklin¹, Shadai McMillan¹, Nicole DeSimone¹, Jesse Galle¹, Sandy Naupari¹, Carol L. Brown¹. ¹Memorial Sloan Kettering Cancer Center, New York, NY, USA, ²Queens Cancer Center, Queens, NY, USA, ³Kings County Hospital Center, Brooklyn, NY, USA, ⁴Memorial Sloan Kettering Cancer, New York, NY, USA.

Background: In oncology, the promise of precision medicine relies fundamentally on the identification of genetic mutations that can be targeted therapeutically. Tumor molecular profiling is becoming standard of care for many cancers, however, not all cancer patients have access to genetic testing of their tumors. Lack of access to tumor molecular profiling for underrepresented minority (URM) patients contributes to cancer health disparities faced by URMs on two fronts. First, genomic profiling may provide real-time information that can alter a patient's course of treatment, if actionable mutations are identified. Second, lack of understanding of genomic differences based on racial and ethnic ancestry may lead to ineffective treatments for URMs. Community partnerships provide one way to improve access to tumor molecular profiling for URMs. **Objective:** Memorial

Sloan Kettering Cancer Center's (MSKCC) Cancer Health Equity Research Program (CHERP) partners with community hospitals/centers (Kings County Hospital, Queens Cancer Center and the Ralph Lauren Cancer Center) to increase access to MSK-IMPACT™ (Integrated Mutation Profiling of Actionable Cancer Targets). MSK-IMPACT™ is a targeted tumor sequencing test used to detect gene mutations and other genetic aberrations in cancer. MSKCC staff work on-site at CHERP partner sites to assist in patient accrual, specimen collection, and specimen shipping to MSKCC. By collaborating with community sites, whose populations are predominantly URMs, MSKCC increases the diversity of the IMPACT biobank while also providing cutting-edge treatment and prevention options to patients based on IMPACT results. Results: Since opening IMPACTED (IMPACT to End Disparities) at our CHERP partner sites in 2016, 391 patients have consented to have their tumor sequenced (as of June 2019). Consistent with the aims of CHERP, the IMPACTED cohort is diverse, including 60% Black, 12% Asian, 20% other/unknown and 25% Hispanic. Two hundred fifty-six patients have had samples successfully sequenced using MSK-IMPACT™, 43% of which had at least one actionable alteration identified. Additionally, 14 patients have had positive germline results, revealing mutations that were not identified prior to their participation on IMPACT. Discussion: MSKCC's partnerships with several community cancer providers had led to the successful enrollment of almost 400 URMs onto MSKCC's MSK-IMPACT™ study, which seeks to identify the molecular drivers of a patient's cancer. Providing access to tumor molecular profiling is a necessary first step to addressing cancer disparities experiences by URMs. However, access alone is not sufficient. Challenges still remain in finding appropriate treatment options, including clinical trials, when mutations are identified and in getting patients access to treatments when they are available. Working closely with our community partners will help us to address these challenges and decrease cancer disparities experiences by URMs.

A091 Consenting challenges toward age, ethnicity, and co-morbidity matching of cancer patient and control populations at a minority-majority safety net hospital.

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Appropriate and diverse representation of minority populations in clinical research studies improves long-term outcomes for all demographics and requires targeted solutions to recruitment challenges. During a two year project at Boston Medical Center (BMC), 191 newly diagnosed, treatment-naïve cancer patients and 76 non-cancer control donors were consented to study relationships between cancer and thrombosis biomarkers. 56% of the cancer patients self-identified as minorities (32% Black, 17% Hispanic, 3% Asian, 4% other or multiple), which reflect the overall demographics of patients undergoing surgery at BMC. However, control donor recruitment for the study was only 36% minorities during the first 6 months (n=9 of 25). These control subjects were younger and white, in part because the study was only advertised on the Boston University Medical Campus. Recognizing potential bias and lack of appropriate representation, two initiatives were developed and executed to balance the cancer and control populations with respect to ethnicity and age. First, active recruitment for older, minority-identifying control subjects expanded into the surrounding community of largely African American and Hispanic populations, by hosting donor recruitment days, with one of the days targeted to older males (≥ 50 years) to better reflect the ongoing cancer patient cohort. Second, consent forms were translated into Haitian Creole and Spanish to enable improved communications with these patients who frequent the hospital. To encourage participation from individuals with a negative perception of research, study coordinators received training in consenting and applied it to provide enhanced patient education. This resulted in a significant improvement in the control's minority percentage to 64% over the project timeline (n=49, 44% Black, 11% Hispanic, 9% Asian). This approach also helped to balance age distributions in the cancer and control populations. The majority of cancer patients were in their 50s and older (81%, mean 59 ± 12 years; n=155). Control subjects in their fifth decade or above was only 32% in the first 6 months, but improved to 55% (mean 46+ 14 years, n=42) by the end of the project. The study was not designed to match comorbidities, but human immunodeficiency virus (HIV) infection, and hepatitis which are known to affect coagulation are highly prevalent in the BMC population. Of the consented cancer patients, 5% had hepatitis and 2% reported active HIV infection, while in the control population 6% had hepatitis and 5% had HIV. Patient demographic, clinical data, analysis results, follow-up data on treatment and thrombotic events, as well as plasma and cell pellets from this study are freely available to the research community from: cssi.cancer.gov/cancer-thrombosis. Overall, frequent data monitoring and adjusting recruitment strategies to emphasize community outreach contributed to balancing ethnic and age distributions in the study populations during this two year study.

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A092 DNA repair proficiency predicts disparities in triple negative breast cancer outcomes. Chinnadurai Mani¹, Jonnalagadda Shirisha¹, Awasthi Sanjay¹, Manne Upender², [Palle Komaraiah](#)¹. ¹Texas Tech University Health Sciences Center, Lubbock, Texas, USA, ²University of Alabama at Birmingham, Birmingham, AL, USA.

Breast cancer remains as one of the most lethal type of gynecological cancers in women. Among various subtypes, triple negative breast cancer (TNBC) is the most aggressive and difficult to treat subtype due to limited therapeutic options. African American women have higher death rate from breast cancer than women of other racial and ethnic groups. Additionally, the incidence of germline BRCA1 mutations is much lower among African American women diagnosed with TNBC, than the women of the other races or ethnicities. Mechanistically, increased DNA repair and cell cycle checkpoint activation remain as the foremost reasons behind TNBC tumor resistance to chemotherapy and recurrence. We used a CHK1 inhibitor prexasertib to inhibit cell cycle checkpoint activation in TNBC cells. Interestingly, we found that prexasertib treatment promotes both proteasome-mediated degradation of BRCA1 and RAD51 proteins and affects their transcript levels. Analysis of DNA repair efficiency in prexasertib treated TNBC cells revealed reduction in homologous recombination efficiency compared to control cells. Based on these results, we hypothesized that prexasertib treatment induced homologous recombination deficiency (HRD) should cause synergistic lethality when combined with PARP inhibitors (PARPi) in TNBC cells. As predicted, combined treatment of TNBC cells with prexasertib and PARPi olaparib resulted in increased DNA strand breaks, gH2AX foci and nuclear disintegration, an indicator of mitotic catastrophe. Similarly, these drug combinations also caused synergistic lethality in multiple TNBC cell lines when compared to single drug-treatments, as indicated by combination index (CI) values. Since RAD51 is the downstream effector repair protein in FA-BRCA pathway-mediated HR, we evaluated TCGA data for RAD51 gene expression using UALCAN portal. Computational analysis revealed that RAD51 overexpression in breast tumors compared to normal breast tissues, in particular, TNBC subtype showed highest RAD51 expression compared to other subtypes of breast cancer. Overall, these data show RAD51 as a poor prognostic marker for breast cancer patients. Interestingly, there was a discrepancy in RAD51 expression levels in distinct racial groups, where African American and Asian breast cancer patients showed high RAD51 expression compared to Caucasian breast cancer patients. Consistent with these observations, African American and Asian TNBC patients show decreased

survival probability. Based on these data, RAD51 could be a biomarker for aggressive TNBC and racial disparity in breast cancer therapeutic outcomes. As positive correlation exists between RAD51 and CHEK1 expression in breast cancer, in-vitro preclinical data presented here provides additional mechanistic insights for further evaluation of the rational combination of prexasertib and olaparib for improved prognosis and to reduce racial disparity in TNBC.

A093 Addressing disparities in breast cancer: Using DNA damage response to bridge the gap. [Shanna J Smith](#)¹, Caroline M Li², Linda H Malkas¹. ¹City of Hope, Duarte, CA, USA, ²City of Hope, Duarte, CA, USA.

Breast cancer currently ranks as the most common and the second most fatal form of cancer affecting women living in the United States. Due to increased awareness, along with advancements in screening techniques and improvement in treatment options, breast cancer has become a more manageable disease. While breast cancer-related deaths have, on average, continued to decrease, gaping health disparities along racial lines have become more prominent. For example African American women living in the greater Los Angeles area have a 70% greater risk of dying from breast cancer, as compared non-Hispanic Caucasian women. Triple-negative breast cancer (TNBC) is a particularly aggressive subtype of breast cancer that disproportionately affects African American women. TN tumors lack the overexpression of estrogen receptor (ER), progesterone receptor (PR), and human estrogen receptor 2 (HER2). This high-grade ductal carcinoma is a more aggressive phenotype that carries with it a greater risk of relapse versus other breast cancer subtypes. Currently, there is a lack of effective treatment options for TNBC, as molecular targets specific to TNBC have yet to be identified and conventional therapies are highly toxic in nature with a high risk of failure. There is a clear need to develop targeted, less cytotoxic therapeutic agents for patients suffering from TNBC. The most common chemotherapeutic or radiotherapeutic agents function by damaging DNA or interfering with DNA replication, and advances in recent years have contributed to a better understanding of the roles key proteins play in DNA damage response pathways. The effectiveness of conventional therapies could be enhanced if specific targets within the DNA damage response pathways were altered or blocked. By selectively sensitizing cancer cells relative to normal tissues, these novel targets have the potential to drastically improve the therapeutic capability. Our lab has previously developed a compound (AOH 1996) that displays the ability to disrupt DNA repair pathways relying on interactions with

proliferating cell nuclear antigen (PCNA). Interestingly, AOH 1996 appears to be more potent in a representative African American TNBC cell line (MDA-MB-468) versus a Caucasian counterpart (MDA-MB-231). The data indicates the repair mechanism in the MDA-MB-468 cell line is more dependent on PCNA-controlled DNA repair pathways. This suggests there is a therapeutic target in TNBC specific to African Americans that can be exploited to develop more effective treatments in this particularly disadvantaged population.

A094 Integrative multi-omics approach reveals complex interplay between HPV, host and microbiome during cervical carcinogenesis in Hispanic and non-Hispanic women.

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Persistent human papillomavirus (HPV) infection is the vital factor driving cervical carcinogenesis; however, other features of the local cervicovaginal microenvironment (CVM) may play a critical role in development of precancerous cervical dysplasia and progression to invasive cervical carcinoma (ICC). Here we investigated relationships between immunoproteomic and metabolic profiles and features of the cervicovaginal microenvironment, such as HPV status, vaginal microbiota (VMB), vaginal pH and genital inflammation, to better understand the complex interplay between host, virus and bacteria. In this multicenter study we enrolled 78 women with ICC, high- and low-grade squamous intraepithelial lesions, as well as HPV-positive and healthy HPV-negative controls. Vaginal swabs and cervicovaginal lavages (CVL) were collected for HPV genotyping, microbiome, metabolome and immunoproteome analyses. The VMB compositions were determined using 16S rRNA gene sequencing. Cervicovaginal metabolic fingerprints were profiled using liquid chromatography-mass spectrometry. Levels of immune mediators and other proteins in CVL samples were evaluated using multiplex cytometric bead arrays. Abnormal vaginal pH and dysbiotic non-*Lactobacillus*-dominated VMB were associated with Hispanic ethnicity and severity of cervical neoplasm. We also identified microbial

signatures (e.g. *Sneathia* spp.) to be enriched in ICC and all precancerous groups. Notably, *Sneathia* abundance was also increased in patients with abnormal pH and those of Hispanic origin. Analyses of 62 protein targets in CVL samples revealed elevated levels of pro-inflammatory cytokines and chemokines, growth and angiogenic factors, apoptosis-related, immune checkpoint and other proteins in ICC patients. Levels of many of these proteins depended on the VMB structure and genital inflammation. These proteomic signatures positively correlated with dysbiotic non-*Lactobacillus*-dominated VMB and abnormal vaginal pH, both features associated with Hispanic ethnicity. Furthermore, metabolomic analysis also revealed that VMB, together with genital inflammation, are the major drivers of metabolic profiles in the local CVM. Finally, using hierarchical clustering analyses, we identified groups of patients who significantly varied in the levels of cancer-related proteins, genital inflammation, vaginal pH and VMB composition regardless of disease severity. These microenvironmental factors may impact the HPV persistence/progression and consequently increase the risk of cervical cancer. Our study demonstrated that the racial/ethnic differences in the VMB compositions may contribute to cervical cancer disparity in Hispanic women. In the future we are planning to expand our investigation of the VMB in Native American women, which will further illuminate the relationship between race/ethnicity, the VMB, and HPV.

A095 Metabolic rewiring in African-American prostate cancer: A role for adenosine-inosine axis in tumor progression.

Christy Charles¹, Jie Gohlke¹, Stacy Lloyd¹, James Henderson², Balasubramaniam Karanam³, Nora Navone⁴, Rick Kittles⁵, Stefan Ambs⁶, George Michailidis⁷, Nagireddy Putluri¹, Arun Sreekumar¹. ¹Baylor College of Medicine, Houston, TX, USA, ²University of Michigan, Ann Arbor, MI, USA, ³Tuskegee University, Tuskegee, AL, USA, ⁴MD Anderson Cancer Center, Houston, TX, USA, ⁵City of Hope Comprehensive Cancer Center, Duarte, CA, USA, ⁶National Cancer Institute, Bethesda, MD, USA, ⁷University of Florida, Gainesville, FL, USA.

Introduction: Prostate cancer (PCa) prevalence and mortality are remarkably higher in African-American (AA) men compared to European-American (EA) men. In addition to known differences in socioeconomic status and access to health care, there is increasing evidence to suggest biological differences between AA and EA PCa. Our lab has pioneered the understanding of reprogrammed metabolism, a hallmark of tumor progression, in AA and EA PCa. Analysis of a compendium of 190 metabolites in ancestry verified, pathologically confirmed AA and EA PCa tissues followed

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by validation of key pathway components in plasma and urine revealed high inosine to adenosine ratio in AA PCa compared to EA PCa. Consistent with this, the enzyme adenosine deaminase (ADA), which converts adenosine to inosine was also found to be elevated in AA PCa. The current study will address the role of adenosine-inosine axis in AA PCa progression and attempt to delineate its significance in the clinical setting. Methods: Analysis of metabolites in tissues, plasma and urine was done using LC/MS. Tissue microarray analysis (TMA) was done to check the expression of ADA in tissues and correlate it to clinical outcomes. To determine the function of ADA in PCa progression, the gene was overexpressed in MDA-PCa-2A (AA) and LNCaP (EA) cells using lentiviral transduction (termed ADA OE). In vitro invasion was assessed using Boyden chamber assay and in vivo tumorigenic properties were examined in nude mice. Molecular studies were performed using qPCR, ELISA and western blotting. Results: Overexpression of the enzyme ADA in PCa cells confers an anchorage-independent growth phenotype (a.k.a. Anoikis Resistance) associated with a reduction in Integrin β 1 (ITGB1) levels. Anoikis resistance is a key prerequisite for metastasis and a hallmark of circulating tumor cells (CTCs). ADA OE AA cells exhibited higher invasive potential compared to the EA cells. Molecular analysis revealed downregulation E-cadherin (epithelial marker) and Bim (pro-apoptotic marker), and upregulation of XIAP (anti-apoptotic marker), all of which support anoikis resistance phenotype in these cells. ADA OE cells had reduced cAMP levels, and addition of external cAMP resulted in reversal of anoikis resistance, increased cell adhesion and rescued ITGB1 levels. Mechanistically, it is postulated that high inosine upon ADA OE activates adenosine receptors A1 and A3, which causes a decrease in cAMP levels. Decreased cAMP affects the Epac-Rap1 signaling, a key regulator of integrin-mediated adhesion. Concomitantly, ADA OE cells also showed a decrease in Rap1 levels. Conclusion: Elevated inosine to adenosine ratio associated with increased expression of ADA is a metabolic hallmark in AA PCa, associated with anoikis resistance and possibly increased CTCs. Our findings also strongly support the potential of using inosine to adenosine ratio in plasma or urine as a predictive marker for PCa incidence or progression in AA men. In addition, ADA could serve as a potential therapeutic target for AA PCa.

A096 Oncogenic TRIM37 is a genetic determinant of racial disparity in TNBC patients. Rachisan Gabriel Djiake Tihagam. University of Virginia, Charlottesville, VA, USA.

Triple negative breast cancer (TNBC) is an aggressive breast cancer subtype that disproportionately affects younger

African American (AA) women. A 5-year survival rate for AA TNBC patients is only 14% compared to 36% of Caucasian patients, which is attributed to early relapse, and metastasis to lung, liver and brain. Although disparities in treatment, co-morbid disease, and access to health care contribute to poor prognosis in AA women, a race-specific genetic component to TNBC disparity cannot be ruled out. To this end, our comprehensive preliminary studies have discovered genetic variations in tripartite motif-containing protein 37 (TRIM37) protein that strongly correlates with TNBC disparity and aggressive metastatic phenotype. Originally, we discovered and characterized TRIM37 as a new breast cancer oncogene that catalyzes histone H2A ubiquitination, a repressive epigenetic modification (Bhatnagar et. al., Nature 2014). Our recent follow-up studies combined with analysis of ethnically diverse genotype-tissue expression, quantitative trait loci, and 1000 genome datasets have discovered single nucleotide polymorphism in TRIM37 that segregate racially. Critically, we have identified TRIM37 polymorphic variants that are predominant in AA women and strongly associate with high TRIM37 in breast tissue. Furthermore, our genetic and biochemical studies establish a strong correlation between TRIM37 expression, metastasis and poor overall-survival using murine TNBC models and TNBC patient tissue analysis. Our comparative mechanistic investigations provide compelling evidence that TRIM37 accelerates TNBC metastasis by enhancing resistance to chemotherapy and inhibiting anoikis pathway, preferentially in AA TNBC relative to non-African American (non-AA) TNBC cells. Therefore, we hypothesize that TRIM37 is a genetic determinant of a high predisposition to metastatic TNBC in AA women, and a strategic target for clinical intervention. Clinical data indicate that AA women have a higher rate of metastatic recurrences compared to non-AA patients. An aggressive clinical course and our preliminary findings strongly suggest that TRIM37 preferentially influences clinical outcome of TNBC in AA women and represents a novel therapeutic target. In this proposal, we will test a highly innovative TRIM37 targeting approach that makes use of cutting-edge antibody-nanoparticle conjugates and antisense oligonucleotide strategy. The overall objectives of this proposal are to demonstrate that TRIM37 is a genetic variant associated with a high risk of metastatic TNBC in AA women and generate proof-of-concept data to treat metastatic TNBC by inhibiting TRIM37 in vivo. Our high precision-targeted approach offers a promising path for selective and effective TNBC treatment. If successful, the described strategy also fits into a broader goal of effective and superior TNBC treatments, and therefore, the potential to generate and replicate additional therapies using other TNBC regulators is very high.

A097 Genomic and transcriptomic characterization of RNA methyltransferases in breast cancer. [Morenci M. Manning](#),

Yuanyuan Jiang, Rui Wang, Lanxin Liu, Madison Bonahoom, Shomita Rode, Zeng-Quan Yang. Wayne State University, Detroit, MI, USA.

Background: Methylations of RNA are catalyzed by RNA methyltransferases (RNMTs) which regulate the structure, stability, translation, and function of almost every major class of human RNA. To date, more than 50 human RNMTs have been identified. Previous studies revealed that mutation and dysregulation of several RNMTs is associated with various human diseases, notably developmental disorders and cancer. However, the genomic and transcriptomic alterations of RNMT genes as well as their functional roles in cancer initiation and progression remain poorly characterized. This study seeks to characterize genetic alterations of 58 RNMTs in human cancer with an enriched focus on breast cancer. Furthermore, we will determine the associations between recurrent genetic alterations and gene expression levels of each RNMT, clinicopathological features, disease-free survival and disparities in breast cancer. Methods: Comprehensive genomic and transcriptomic analyses of 58 RNMTs in more than 10,000 primary tumors was performed using TCGA and METABRIC datasets. Copy number and gene expression of RNMTs were assessed by clinicopathological features of breast cancer in approximate 2,000 METABRIC breast tumors with long-term clinical follow-up data. Loss-of-function analysis was performed to examine RNMT candidates with important roles in growth and viability of breast cancer cells. Additionally, one candidate RNMT, FTSJ3 (FtsJ RNA methyltransferase homolog 3), was further pursued in order to assess its impact on cancer cell phenotypes in a panel of breast cancer cell lines. Results: We identified that a subset of RNMT genes, including TRMT12, NSUN2, and FTSJ3, have high frequencies of genomic amplification in a spectrum of human cancers, particularly in breast cancer. Several RNMTs, notably FTSJ3 and EMG1, are highly amplified and over-expressed in breast cancers of African-American women compared with that of European-American women. Breast cancer has been classified into five intrinsic subtypes with distinct risks and underlying biology. We found that different subtypes of breast cancer had different patterns of copy number and expression of each RNMT. Furthermore, we revealed that FTSJ3 was associated with higher grade and advanced stage of breast cancer. A genome-wide loss-of-function shRNA screen in a large panel of tumor lines indicated that FTSJ3 was required for the survival of some tumor cell lines. FTSJ3 depletion using siRNA oligos caused apoptosis and suppressed breast cancer cell survival with minimal effect on normal-like breast cancer cell survival. Conclusion: We

identified a subset of RNMTs, notably FTSJ3, that were significantly associated with cancer aggressiveness and poor prognosis. Loss-of-function analysis revealed that FTSJ3 had important roles in promoting breast cancer cell growth and survival. Our findings provide a framework for further study of the functional consequences of RNMT alterations in human cancer, and for developing therapies that target RNMTs in future.

A099 Oncotype Dx test receipt among Latina women with breast cancer: A population-based retrospective cohort study. [Nicholas Acuna](#)¹, Antoinette M. Stroup², Jennifer Tsui², Adana A.M. Llanos¹.

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Introduction. The clinical utility of Oncotype Dx (ODx) testing, in order to estimate breast cancer (BrCa) recurrence risk and chemotherapy benefit, is widely accepted. However, population-based data on the utilization of ODx testing among Latina BrCa patients are limited. In this study, we are examining eligibility and receipt of ODx testing among Latinas in New Jersey diagnosed with breast cancer from 2008 to 2013, and assessing factors associated with ODx test receipt in the population. Methods. Data on all primary, histologically confirmed, invasive BrCa cases diagnosed among women between January 1, 2008 and December 31, 2013 (N=32,770) were retrieved from the New Jersey State Cancer Registry. In order to identify Latina cases, those that were coded not as Non-Hispanic on the North American Association of Central Cancer Registries Hispanic Identification Algorithm were included in the analytic sample. Guideline-concordant ODx testing was classified as testing among Stage IA, Stage IB, Stage IIA or Stage IIB, node-negative, estrogen receptor-positive and/or progesterone receptor-positive, human epidermal growth factor receptor-negative cases. Results. Approximately 9% of the total population-based sample of invasive BrCa cases were Latinas (n= 3,036). Among them, the average age at diagnosis was 55.8±13.3 years, 76.0% had ductal carcinoma histology, and 7.8% and 11.1% were non-luminal HER2-expressing and triple-negative subtypes, respectively. In terms of eligibility for ODx testing, 45.8% (1,391/3,036) were eligible and among them, 23.9% (333/1,391) received the test. Among those ineligible for ODx testing, 2.6% (43/1,645) received the test. Conclusions. The underutilization of guideline-concordant ODx testing among eligible Latina BrCa cases in New Jersey (<50%) could indicate that there is unequal access to appropriate genetic testing and optimal adjuvant

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chemotherapy. This might exacerbate disparities as BrCa is a leading cause of cancer death among Latinas. Our future aims include assessment of factors associated with guideline-concordant ODx test receipt among Latinas, and the impacts of ODx test receipt on BrCa treatment and survival.

A101 The impact of dementia on cancer treatment decision-making, cancer treatment, and survival. Yaelin Caba Silverio¹, Bian Liu¹, Emanuela Taioli¹, Kavita Dharmarajan². ¹Icahn School of Medicine, New York, NY, USA, ²Mount Sinai Hospital, New York, NY, USA.

Introduction: Dementia and cancer are common conditions affecting older adults. Yet, little is known about the effect of dementia on cancer treatment decision-making and the subsequent health outcomes in people diagnosed with cancer. We performed a mini review of the recent literature to assess the current knowledge and gaps on the impact of dementia on cancer treatment decision-making, treatment received, and survival. Methods: A systematic search of the PubMed database with keywords “dementia,” “cancer,” “treatment decision-making,” and “management” was performed to identify studies on older adults with a diagnosis of dementia before a diagnosis of cancer and/or comorbid cancer and dementia published in the English language from January 2004 to December 2018. We used the Mixed Methods Appraisal Tool to critically appraise the methodological quality of studies. We conducted meta-analyses wherever quantitative elements could be extracted to derive the summary odds ratios (ORs) and hazard ratios (HRs). Results: There were 55 studies (out of 829 from the initial search) included in the final full text-review. Health professionals, care givers, and patients with dual cancer and dementia tended to prefer less aggressive care and gave higher priority to quality of life over life expectancy. However, they also faced unique challenges. The decision-making processes varied widely among health professionals because of differences in personal opinion, lack of specific guidelines, difficulty in obtaining informed consent, and expectations of patient discomfort. Consistent with previously published findings on decision-making preferences, the meta-analysis showed that people with dementia were less likely to receive chemotherapy (OR=0.32 (95% CI: 0.31 to 0.35), $n_{\text{studies}}=12$), radiation therapy (OR=0.56 (95% CI: 0.18 to 1.78), $n_{\text{studies}}=6$), and surgery (OR=0.61 (95% CI: 0.34 to 1.08), $n_{\text{studies}}=5$) than other treatment. In addition, people with cancer and dementia had greater odds of receiving no treatment versus any treatment (OR=4.25 (95% CI: 1.65 to 10.90), $n_{\text{studies}}=5$). Older adults with both cancer and dementia had worse survival than those with cancer alone (HR =1.97 (95% CI: 1.67 to 2.31), $n_{\text{studies}}=19$). Conclusions: Our review showed

that an underlying dementia diagnosis was associated with greater odds of receiving less and no cancer treatment, and with worse survival. Current practices in treatment-decision making and overall cancer management for patients with the dual diagnosis are inconsistent. There is an urgent need for guidelines in this growing population of cancer and dementia patients.

A102 Association of lymphoid malignancies and area-based socioeconomic status with survival in the United States. Maira A Castaneda-Avila¹, Bill Jesdale², Mara Epstein². ¹University of Massachusetts- Medical School, Worcester, MA, USA, ²University of Massachusetts - Medical School, Worcester, MA, USA.

Background: Over 114,000 new cases of lymphoid malignancies (LM), including Hodgkin lymphoma (HL), Non-Hodgkin lymphoma (NHL) and multiple myeloma (MM), are diagnosed annually. However, little is known about the influence of socioeconomic status (SES) on LM survival among Hispanics, who comprise 18% of the US population. This study evaluates the association between area-based SES and survival of Hispanic LM patients compared with non-Hispanic whites and non-Hispanics blacks. Methods: All LM reported to the NCI Surveillance, Epidemiology, and End Results Program (SEER-18) diagnosed between 2000-2015 were included. Census tract-level socioeconomic status (SES) was assessed in tertiles. Cox proportional hazards models estimated hazard ratios (aHR) to evaluate SES with cause-specific survival, adjusted for sex, stage at diagnosis, radiation, surgery and chemotherapy. All analyses were stratified by race/ethnicity. Results: Hispanics with low SES diagnosed with MM were 30% (aHR:1.3, 95% CI: 1.0-1.6) more likely to die from MM than those Hispanics with high SES. Whites and blacks with low SES diagnosed with MM were 20% (95% CIwhites: 1.1-1.3; 95% CIblacks: 1.0-1.4) more likely to die from MM than those with high SES. An association of low SES and death from NHL also found among Hispanics (aHR: 1.2; 95% IC: 1.1-1.5), whites (aHR: 1.3; 95% IC: 1.2-1.4) and blacks (aHR: 1.3; 95% IC: 1.0-1.7) compared to high SES groups. No association was found for HL. Conclusion: Low SES was associated with worse LM survival among different races/ethnicities. These results suggest SES is an important factor in determining long-term outcomes of patients diagnosed with LM.

A103 New perspectives of racial disparities in breast cancer mortality through the care continuum. [Lindsay J Collin](#), Katie

Ross, Catherine Osborne, Ming Yan, Renjian Jiang, Jeffery M Switchenko, Jasmine Miller-Kleinhenz, Keerthi Gogineni, Kevin C Ward, Lauren E McCullough. Emory University, Atlanta, GA, USA.

Background: In the US, non-Hispanic black (NHB) women are nearly twice as likely to die from breast cancer (BC) compared to their non-Hispanic white (NHW) counterparts, but there is a dearth of information on specific drivers of this disparity. Often attributed to later stage at diagnosis and triple-negative BC, recent evidence suggests that more pronounced racial disparities in BC mortality are evident in prognostically favorable tumors. To better understand this disparity, we evaluated the contribution of factors related to quality of care— such as characteristics of the surgical facility, delays in receipt of treatment, and receipt of guideline-concordant care—to BC mortality disparities among NHB and NHW women residing in Atlanta, GA. Methods: The study population was identified from the Georgia Cancer Registry (GCR). We included 4708 NHW and 3243 NHB women with a diagnosis of stage I-III primary BC in metro Atlanta (2010–2014). Facility characteristics included the annual volume of patients, facility type, and accreditations and affiliations, which were abstracted from the NIH SEER-Medicare linked database. Delay in receipt of surgery (>30 days from diagnosis) was based on the recorded surgery dates available through the GCR. Using the National Comprehensive Cancer Network guidelines for treatment decisions, we evaluated a patient's receipt of guideline-concordant care of individual treatment modalities. We used logistic regression to estimate the association between surgical facility characteristics and surgical delay by race-ethnic group, as well as Cox proportional hazard regression to estimate disparities in BC mortality by surgical facility characteristics and receipt of guideline-concordant care. Results: Overall, 60% of NHB women received surgery >30 days after their diagnosis, compared to 48% of NHW women. In multivariable-adjusted models, high annual patient volume was associated with an increase in surgical delay among NHB women (odds ratio [OR] =1.23 95% confidence interval [CI] 0.96–1.58), but was more pronounced among NHW women (OR=2.18, 95%CI 1.80–2.65). Nonetheless, high annual patient volume was associated with a decreased hazard of BC mortality among NHW women (hazard ratio [HR] =0.60, 95%CI 0.44–0.83), but an increase among NHB women (HR=1.32, 95%CI 0.82–2.05). Interestingly, we observed that among women with guideline discordant chemotherapy, NHB women had twice the hazard of BC mortality compared to NHW women (HR=2.17, 95%CI 1.69–2.77), with a similar increased hazard

among women with concordant chemotherapy (HR=2.13, 95%CI 1.71–2.65). These results were consistent for guideline concordant care of receipt of radiation. Conclusion: Our preliminary results suggest that characteristics of the surgical facilities may impact both surgical delay and BC mortality. However, the impact on patient outcomes varies among NHB and NHW women. Our results also suggest that regardless of receipt of guideline concordant care, disparities persist in BC mortality.

A104, PR07 Lung cancer incidence and risk factors in never-smoking Asian American, Native Hawaiian, and Pacific Islander women: A multilevel dataset of electronic health record, cancer registry, and environmental data. [Mindy C](#)

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Background: For Asian American, Native Hawaiian and Pacific Islander (AANHPI) females, lung cancer is one of the most common cancers and the leading cause of cancer death. More than half of AANHPI female lung cancers occur in never-smokers, and contributing risk factors among never-smokers remain largely unknown. Until now, there was no single sufficiently-large data source to document lung cancer incidence rates by smoking status and sex among specific AANHPI ethnic groups, which is central to understanding and reducing the burden of this disease in this population. We assembled a large-scale cohort to quantify the burden of lung cancer by smoking status among single- and multi-ethnic AANHPI groups, with an emphasis on identifying the underlying factors driving lung cancer risk among never-smoking AANHPI females. Methods: Assembly of the cohort involved (1) harmonizing and pooling electronic health record (EHR) data on known and putative lung cancer risk factors from two large health systems (i.e., Northern California Sutter Health system and Kaiser Permanente Hawaii (KPH)), (2) linking EHR data from Sutter and KPH with tumor and

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diagnosis data from the California Cancer Registry and Hawaii Tumor Registry, respectively, (3) geocoding and linking the Sutter portion of the cohort to regional air pollutant data and data on specific neighborhood contextual factors from the California Neighborhoods Data System, and (4) developing neighborhood contextual variables to enhance the geocoded data for KPH cohort members. Incidence rates stratified by sex, detailed race/ethnicity, smoking status, and lung cancer histology have been calculated; as well as incidence rate ratios by race/ethnicity. Results: The cohort comprises over 2.3 million individuals (250,000 AANHPI females) followed up to 15 years for incident lung cancer. It includes over 6,000 incident lung cancer cases, of which 558 are AANHPI females. Among AANHPI female groups, proportions of lung cancers among never-smokers range from 31% among Native Hawaiian to 88% among Chinese females. Incidence rates of never-smoking lung cancer are highest among Native Hawaiian females (AAIR, 28.7) and Asian females reporting multiple races/ethnicities (AAIR, 27.8). Conclusions: We have assembled a large, integrated dataset well-suited to study multi-level risk of lung cancer that will serve as a critical evidence base to inform screening, research, and public health priorities, especially among AANHPI females. Ongoing work will include longitudinal analyses of lung cancer risk among never-smoking AANHPI females, including absolute risk modeling, examining six exposure domains representing known and putative lung cancer risk factors.

A105 Trends in acute lymphocytic leukemia (ALL) incidence in the US from 2000-2016. Qianxi Feng¹, Maria Vergara-Lluri², Ivo Muskens¹, Roberta McKean-Cowdin¹, Scott Kogan³, Russell Brynes², Adam de Smith¹, Joseph Wiemels¹. ¹Department of Preventive Medicine, USC Keck School of Medicine, Los Angeles, CA, USA, ²Department of Pathology, USC Keck School of Medicine, Los Angeles, CA, USA, ³Department of Laboratory Medicine, University of California San Francisco, San Francisco, CA, USA.

Objectives. The causes of ALL are determined in part by genetic factors but less clear is the role of the environment. Temporal and demographic changes in incidence may help illuminate causes and help direct new lines of research. We sought to investigate in the US from 2000-2016, 1) the distribution of ALL incidence by race/ethnicity, 2) trend change in ALL incidence and 3) the association between ALL incidence and location of birth (US or a foreign country) among different ages and race/ethnicity groups. Methods. We used data from the population-based Surveillance, Epidemiology and End Results (SEER) Registry. Age-adjusted incidence rates (AAIRs) per 100,000 persons were calculated

for people of Latino ethnicity (all races), Non-Latino (NL) White, NL Black, NL Asian and Pacific Islander (API), NL American Indian, and Alaskan Native (AIAN). Trends of ALL from 2000 to 2016 were evaluated with the annual percent change (APC) of AAIRs. We further used a Poisson regression model with standardized population offset to analyze the association between the community-level percent of people born in a foreign country and the AAIR of ALL among NL Whites, NL Blacks, and Latinos. The analyses were stratified by race/ethnicity and age groups, and adjusted for sex, year of diagnosis and socioeconomic position (SEP, identified with a time-dependent Yost index variable from census tract). Results. Among 23,829 individuals of all ages diagnosed with ALL from 2000 to 2016 in the US, 8,297 were Latinos, 11,714 were NL Whites, and 1,639 were non-Latino Blacks. Compared to NL Whites (AAIR=1.56), the AAIR was significantly higher for Latinos (AAIR=2.43; $p < .001$) but lower for NL Blacks (AAIR=0.95; $p < .001$). The AAIR increased significantly from 2000-2016 overall (APC=0.97; 95% CI: 0.67, 1.27), with the highest increase in Latinos (APC=1.18; 95% CI: 0.76, 1.60). The AAIR for NL Whites, APIs, and AIANs remained stable during the study period. In adjusted models, AAIRs increased significantly with the percent of foreign-born for NL Whites (p -trend<.001) and Blacks (p -trend<.001), but decreased with the percent of foreign-born for Latinos (p -trend<.001). This finding was consistent for all age groups. Conclusion. The Age Adjusted Incidence Rates (AAIRs) of ALL from 2000-2016 were highest among Latinos compared to other ethnic groups. Latinos had the fastest increase in AAIR in this period, which was significant in the childhood, young adult, and older adult age groups. Our analysis showed several intriguing trends relating to ethnicity and country of origin which remain unexplained in the scientific literature. Most notably, we show that previously-noted increases in the incidence of ALL for Latinos have continued to climb, in both children and adults, establishing this group as the most highly burdened with this disease. These trends should help direct future research into risk identification and disease prevention in the most vulnerable populations.

A106 Preexisting mental illness on all-cause and cause-specific mortality among Medicaid-insured women diagnosed with breast cancer. Wayne R Lawrence¹, Akiko Hosler¹, Margaret Gates², Matthew Leinung³, Xiuling Zhang², Wangjian Zhang¹, Maria Schymura¹, Francis Boscoe¹. ¹University at Albany, State University of New York, Albany, NY, USA, ²New York State Department of Health, Albany, NY, USA, ³Albany Medical College, Albany, NY, USA.

Background: Research suggests mental illness contributes to poor survival among cancer patients. In New York State (NYS), Medicaid is the largest single insurer for individuals with mental illness. We investigated the influence of preexisting mental illness on all-cause and cause-specific mortality among Medicaid-insured women diagnosed with breast cancer. Methods: 9,479 women aged <65 years diagnosed with breast cancer and reported to the NYS Cancer Registry from 2004-2016 were linked with NYS Medicaid claims. Women were grouped as having depression or severe mental illness if they had at least three diagnosis claims for mental illness with at least one claim within three years prior to breast cancer diagnosis. Severe mental illness included schizophrenia, bipolar disorder, and other psychotic disorders. Hazard ratios (HR) and 95% confidence intervals (95% CI) were calculated with Cox regression, adjusting for potential confounders. Results: Women with severe mental illness had greater risks of all-cause (HR 1.49; 95% CI 1.25, 1.78), cancer (HR 1.36; 95% CI 1.09, 1.68), and cardiovascular (HR 2.14; 95% CI 1.22, 3.74) mortality compared to women without mental illness. No association was observed for depression. The association between severe mental illness and all-cause mortality was strongest among Asians (HR 3.85; 95% CI 1.55, 9.60) but also observed in White (HR 1.50; 95% CI 1.17, 1.93) and Black (HR 1.36; 95% CI 1.02, 1.80) women. Additionally, associations were also observed among obese (HR 1.83; 95% CI 1.42, 2.36) and postmenopausal (HR 1.64; 95% CI 1.35, 2.01) women with preexisting severe mental illness, but no association was observed for premenopausal women. Conclusion: Women with preexisting severe mental illness diagnosed with breast cancer have an elevated mortality risk and should be monitored and treated by a coordinated cross-functional clinical team.

A107 Disparities in gastric adenocarcinoma and its precursors in South Texas: A secondary analysis of electronic health data from two affiliated institutions.

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Gastric (GC) affects U.S. Latinos disproportionately relative to non-Hispanic whites (NHWs), particularly in South Texas (STX). *Helicobacter pylori* infection (HP) accounts for 90% of cases and is considered the primary GC risk factor. Disparities in GC incidence rates are likely linked to similar disparities in diagnosis and management of precursor conditions, including chronic HP, gastric ulcer (GU) and atrophic gastritis (AG). Preliminary studies found significantly higher HP exposure among Latinos than NHWs in two local populations: 30.3%

vs. 9.2% in men participating in a prostate cancer cohort, and 36.7% vs. 16.2% among men and women attending UT Health San Antonio (UTMed) clinics. This study aimed to establish differences in *H. pylori*-related gastric diagnoses among Latino and NHW patients at UTMEd and its affiliated hospital University Health System (UHS). Aggregate data was compiled from a PCORnet CDM data set created from electronic health records sourced from the two health systems and stored at the Clinical Informatics Research Division in the Department of Population Health Sciences at UTMEd. Data was selected by using cohort demographic criteria and standard codes (ICD9/10 and LOINC) for diagnostic and laboratory criteria. DBVisualizer Pro was used to write an Oracle SQL script. Results were exported into Microsoft Excel and the file transferred securely via REDCap Send-It. Incidence rate ratios (RR) for all diagnoses were analyzed using STATA. A total of 844,414 records, 54.5% of which were women, were found matching the criteria (age 18 or older, Latino and NHW; Blacks and Asians excluded). These were examined for *H. pylori* (HP) infection with or without the other GC precursor conditions, as well as gastric adenocarcinoma (GCA), the most common form of GC. Results were stratified by age, gender, ethnicity and health system. Women accounted for most of the diagnoses (67-72%), except for GU at UHS and GCA at both locations. There were no differences in diagnosis rates between health systems, except for GU (Latino UHS patients were 1.49-1.77 times at risk as their UTMEd counterparts) and HP (NHW UTMEd women were 1.34 times at risk as UHS women). Latinos had higher rates of all diagnoses ($p < 0.05$) except for GU, where there was no difference between ethnic groups and locations. The largest overall disparity was for combined HP+GCA at UHS (RR=3.50; 95% CI 1.37, 10.60; $p = 0.0037$). Latina women largely accounted for this (6.00; 1.34, 55.20; $p = 0.0074$). UHS GCA was the single diagnosis with the greatest disparity (1.81; 1.47, 2.23; $p < 0.001$), followed by UHS HP (1.75; 1.66, 1.85; $p < 0.001$). Latina women were twice as likely to have GCA as their NHW counterparts at both health systems (1.87-2.12; 1.34, 3.02; $p < 0.001$). Subsequent analyses will take into consideration management practices, follow-up and covariates like median income and geographic disparities, as well as incidence rates of gastric lymphomas, including mucosa-associated lymphoid tissue (MALT), the only lymphoma associated with HP.

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A108 Differences in incidence by sex and race/ethnicity of adrenocortical carcinomas and malignant pheochromocytomas and paragangliomas in California.

California. [Claire K. Mulvey](#), Alan Paciorek, Brandon Shih, Meg McKinley, Dawn Pearson, Iona Cheng, Li Zhang, Ann Griffin, Quan-Yang Duh, Sanziana Roman, Julie Ann Sosa, Insoo Suh, Chienying Liu, Katherine Van Loon, Emily Bergsland. UCSF, San Francisco, CA, USA.

Background: Malignant pheochromocytomas (PHEO), paragangliomas (PGL), and adrenocortical carcinomas (ACC) are rare endocrine malignancies with limited data regarding risk factors. To further elucidate their epidemiology, we sought to characterize the burden of malignant PHEO, PGL, and ACC in California. Methods: Using the population-based California Cancer Registry, we identified all new diagnoses of malignant PHEO, PGL, and ACC in California from 1992-2016 (ICD-O-3 codes 8700/3, 8680/3, and 8393/3). We calculated age-adjusted incidence rates (AIR) standardized to the 2000 United States census. We compared AIRs by sex, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and Asian/Pacific Islander), and county of residence (categorized as urban versus suburban/rural) using SEER*Stat and generated IR ratios (IRR). Results: Between 1992-2016, there were 261 incident cases of malignant PHEO, 271 of malignant PGL, and 866 of ACC in California. Overall AIR per 100,000 person-years were 0.03 for PHEO, 0.03 for PGL, and 0.10 for ACC. Incidence differed by both sex and race/ethnicity. Men had a higher incidence of PGL than women (IRR 1.49, 95% confidence interval [CI] 1.13-1.98; $p < 0.05$) and tended towards higher incidence of PHEO (IRR 1.24, 95% CI 0.97-1.60; $p = 0.09$), while men had a lower incidence of ACC than women (IRR 0.80, 95% CI 0.69-0.92; $p < 0.05$). Compared with non-Hispanic White Californians, non-Hispanic Black Californians had higher PHEO incidence (IRR 1.65, 95% CI 1.05-2.51; $p < 0.05$), whereas PGL incidence was lower for Hispanic (IRR 0.60, 95% CI 0.41-0.87; $p < 0.05$) and Asian/Pacific Islander Californians (IRR 0.60, 95% CI 0.35-0.97; $p < 0.05$). Compared with non-Hispanic White Californians, ACC incidence was lower in non-Hispanic Black (IRR 0.58, 95% CI 0.40-0.82; $p < 0.05$), Hispanic (IRR 0.65, 95% CI 0.54-0.78; $p < 0.05$), and Asian/Pacific Islander Californians (IRR 0.60, 95% CI 0.46-0.76; $p < 0.05$). There were no differences in IRRs according to county of residence for either PHEO, PGL, or ACC. Conclusions: Malignant PHEO, PGL, and ACC remain rare cancers in California, with disease-specific differences in IRR's by sex and race/ethnicity but not by urban versus suburban/rural county of residence. We report novel findings of a higher incidence of malignant PHEO in non-Hispanic Black Californians and a lower incidence of malignant PGL in Hispanic and Asian/

Pacific Islander Californians. We also confirm higher incidence of ACC in women and non-Hispanic White Californians. Additional research is needed to clarify whether these differences reflect disparities in access to care.

A110 Could use of individualized risk models mitigate health disparities in eligibility for lung cancer screening?

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Background: Current US Preventive Services Task Force (USPSTF) lung cancer screening guidelines recommend screening ever-smokers aged 55-80 years with ≥ 30 pack-years who currently smoke or have quit in the last 15 years. However, USPSTF guidelines could exacerbate health disparities, since they do not account for race/ethnicity, gender or socioeconomic status. In particular, African-Americans have a higher risk of developing lung cancer despite smoking less than their white counterparts, suggesting that current guidelines may eliminate many African Americans from screening despite having equivalent risk to whites. Validated lung cancer risk models, some of which include race/ethnicity, have been proposed for determining screening eligibility, although it is unknown whether these would mitigate any potential disparities. Methods: Using data from the US-representative 2015 National Health Interview Survey, we calculated those eligible for screening (overall and by subpopulations) under USPSTF guidelines, and three prominent validated lung cancer risk models (Bach, PLCOM2012 and LCRAT) at a range of risk thresholds. The PLCOM2012 and LCRAT models include race/ethnicity, and the Bach and LCRAT models include gender. We also calculated the distributions of pack-years, cigarettes per day (cpd) and years smoked by race/ethnicity. Results: Using a 2.3% 6-year lung cancer risk threshold for each model, a higher proportion of those selected by risk models are African-American (PLCOM2012: 10%, LCRAT: 12%, Bach: 9%) compared to USPSTF guidelines (7%). In contrast, a lower proportion of those selected by risk models are Asian-American (PLCOM2012: 1.6%, LCRAT: 1.4%, Bach: 2.1%) compared to USPSTF guidelines (2.7%). The models disagree on the proportion selected who are Hispanic (PLCOM2012: 1.5%, Bach: 5.1%, LCRAT: 2.6%), although the proportion selected by USPSTF guidelines (3.9%) is within their range. Some of the differences between models may occur as a result of how each model assigns risk to smokers with < 30 pack-years, which occurs more frequently in racial/ethnic minorities: 82% of African-American ever-smokers aged 50-80, 84% of Hispanic and 80% of Asians had smoked

<30 pack-years, compared to 67% of whites. Conclusions: Substantially higher proportions of those selected for lung screening by risk models were African-American than by USPSTF guidelines. However, risk models might select smaller proportions of Asian-Americans than USPSTF guidelines and disagree on the proportion selected who are Hispanic. Given historical lack of equal access to healthcare among minorities, the use of risk models to determine screening eligibility requires careful thought.

A111 Racial differences in the relationship between dimensions of smoking exposure and lung cancer risk: A pooled analysis from the International Lung Cancer Consortium Study.

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Lung cancer incidence is higher among African Americans (AAs) compared with European Americans (EAs) and Asian Americans (AsA) in the United States. Although there has been a significant reduction in cigarette smoking, racial disparities in tobacco use and lung cancer risk persist in the US. While data exists suggesting that African Americans have a higher risk of lung cancer at lower cigs per day, data independently linking each measure of smoking exposures and lung cancer risk among AAs compared with EAs and AsA are limited. We conducted a pooled case-control study of 19,965 cases and 331,478 controls from 10 population-based case-control and cohort studies from the US within the International Lung Cancer Consortium (ILCCO). We used logistic regression models to examine associations between several smoking dimensions (status, age at initiation, duration, intensity, pack-years and cessation) and lung cancer risk. Overall, the magnitude of the relationship between each dimension of smoking exposure and lung cancer risk was higher among AAs. AAs who were light smokers had an increased odds of lung cancer compared with EAs and AsA (1-10 cigs/day: AA OR = 5.66, 95% CI: 4.73-6.76; EA OR = 2.86, 95% CI: 2.58-3.17; AsA OR = 2.82, 95% CI: 2.35-3.39) after adjustment for age, gender and study center. Similar trends were observed for age at smoking initiation (age at smoking initiation 25+ years: AA OR = 7.54, 95% CI: 6.35-8.96; EA OR = 5.49, 95% CI: 4.99-6.03; AsA OR = 4.00, 95% CI: 3.44-4.66). This study suggests that racial and ethnic differences between individual dimensions of smoking exposure and lung cancer exist. In general, at equal levels of

exposure, AAs seem to be more susceptible than EAs and AsA. Future work will assess if these findings hold following adjustment for population specific smoking patterns.

A112 Lifetime cigarette smoking and breast cancer risk in young women: Racial and socioeconomic disparities in risk in the Young Women's Health History Study.

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The etiology of breast cancer (BC) among young women is not well understood. Recent studies have suggested that tobacco exposure is associated with an increased risk of BC but few studies have evaluated risk among women under age 50 or racial and socioeconomic disparities in risk. We hypothesized that racial and socioeconomic differences in age at smoking initiation and lifetime cigarette smoking contribute to disparities in BC risk among young women. Data were examined from a population-based case-control study in women under 50 years of age, the Young Women's Health History Study. In total, 1,812 women with invasive BC (1,130 Non-Hispanic (NH) White, 682 NH Black) and an area-based sample of 1,381 control women (716 NH White, 665 NH Black), frequency matched to cases by five-year age group, study site and race were identified and interviewed from the Los Angeles County and Metropolitan Detroit SEER registry areas. Lifetime smoking history (including age at initiation, duration, and frequency) were collected from structured in-person interviews. Survey-weighted multivariable logistic regression was used to evaluate the association between lifetime cigarette smoking and BC risk adjusted for matching and known BC risk factors. Additionally, cross-product interaction terms of smoking exposure by race and by socioeconomic position (SEP; based on household percent poverty) were evaluated by Wald's test. Among controls, 36.5% reported ever smoking at least 1 cigarette a day for at least 6 months in their lifetime with White women compared to Black women (38.3% vs. 32.3%) and women of lower SEP (<150% of poverty) compared to higher SEP (≥150% of poverty) (50.4% vs. 31.5%) being more likely to have ever smoked. In adjusted models, those who ever vs. never smoked were 1.20 times as likely to develop BC;

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findings were marginally significant (95% confidence interval (CI): 0.99-1.46, $p=0.07$). No differences were found by race or SEP, nor was there a consistent association with BC risk for duration of smoking history (in pack-years) or average number of cigarettes smoked per day. Age at smoking initiation (never smoker, initiated at age <25 years, initiated at age ≥ 25 years) was significantly positively associated with BC risk (p trend=0.02). Smoking initiated at 25 years or older was associated with a 78% increased risk of BC compared to never smokers (95% CI: 1.15-2.77). A positive association between age at initiation and BC risk was observed among White (p trend=0.048), but not Black women. A marginally significant increased risk with age at initiation was observed among women of higher SEP (p trend=0.05) but not among those of lower SEP. We found evidence that smoking is associated with an increased risk of BC in young women, especially among those who started smoking at an older age. Despite efforts to reduce smoking, the prevalence of smoking remains highest among people of low socioeconomic position, as we found. Encouraging women not to initiate smoking is important to reduce BC risk among women under age 50.

A113 Smoking rates at time of lung cancer diagnosis at an academic medical hospital. Lillian C Man, Charnita Zeigler-Johnson, Rita Axelrod. Sidney Kimmel Cancer Center, Philadelphia, PA, USA.

Background: Cigarette smoking is a known cause of lung cancer. Data from the National Health Interview Survey (NHIS) showed that the prevalence of cigarette smokers in the United States has declined from 20.9% in 2005 to 15.5% in 2016. A variety of sociodemographic factors, including ethnicity and gender, are associated with the rate of cigarette smoking. Although there have been significant efforts to decrease smoking rates in the US, lung cancer disparities may be related to smoking behavior among high risk populations. The goal of this study is to examine changes in the prevalence of current smoking among incident lung cancer patients from 2005-2016. We hypothesized that the percent of smokers among lung cancer patients changed differentially over time by race-gender group. Methods: We conducted a descriptive study using deidentified data collected at the time of lung cancer diagnosis from Thomas Jefferson Cancer Registry from 2005-2016. Thomas Jefferson University Hospital is an academic medical hospital in Philadelphia with an inner-city population as well as a large community and referral-based population. We described characteristics of patients and smoking patterns in our cohort by gender and by the three largest racial groups (whites,

blacks, Asians). We divided our time periods into 2005-08, 2009-12, and 2013-16 and calculated the percent of current smokers by race and gender group for each time period. We used chi-square tests and Fisher's exact tests to determine differences in current smoking prevalence at each time period for each patient group using Stata software, version 13.1 (StataCorp) and Microsoft Excel. Results: Our sample included 4251 lung cancer patients. The median age of our population was 68 years (range: 20-96) and 53% were female. Our demographics were as follows: 73.7% self-identified as white, 20.7% black, 4.3% Asian. At the time of diagnosis, 33.2% were current cigarette smokers. The highest rates of current smoking were in black males, with an overall smoking rate of 46.1%. The prevalence of current smoking decreased significantly over time in white women: 40% from 2005-2008, 33.6% from 2009-2012, and 28.5% from 2013-2016 ($p<0.005$). In Asians, blacks, and white men, there was no statistically significant change in smoking prevalence from 2005-2016. Results can help our health system to focus smoking cessation strategies toward specific populations of patients where we see increases or unchanged percentages of current smokers. Conclusion: The overall prevalence of tobacco smokers in our patients was much higher than that of the general population captured through the NHIS surveys. Despite a declining number of tobacco users in the United States, the prevalence of tobacco use in our cohort remained unchanged from 2005-2016 in all groups apart from white females. Increased efforts to augment tobacco cessation are warranted and investigation to determine whether different interventions might be more effective in different race and gender groups should be considered.

A114 Changes in employment status and productivity after a cancer diagnosis as markers of long-term financial well-being. Shoshana Adler Jaffe, Jessica Anderson, Yvonne Dailey, Dolores Guest, Andrew Sussman, Angela Meisner, Charles Wiggins, Jean McDougall. University of New Mexico, Albuquerque, NM, USA.

Background: Cancer and its treatment interfere with employment, often leading to prolonged leave, changes in hours, and reduced productivity. Socioeconomic disparities in employment outcomes have been documented previously, but the relationship between employment outcomes following a cancer diagnosis and long-term financial well-being (FWB) is poorly understood. The objectives of this analysis were to identify patient sociodemographic characteristics associated with negative changes in employment and productivity and to explore the relationship between these changes and FWB. Methods: In this cross-

sectional study, working-age individuals diagnosed with stage I-III breast, colorectal, or prostate cancer were sampled from the New Mexico Tumor Registry. Participants completed a survey about their economic experience at three different time points (the year prior to cancer diagnosis, the year after diagnosis, and at the time of the survey). Changes in self-reported employment status and productivity were ascertained using validated questions from the Medical Expenditure Panel Survey Experiences with Cancer Supplement. FWB was characterized using the Financial Well-Being Scale (0-100) from the Consumer Financial Protection Bureau. Logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI) for the association between sociodemographic characteristics and employment changes or productivity. Multivariable linear regression with propensity score weighting was used to model the relationship between changes in employment, changes in productivity, and FWB. Results: A total of 292 employed cancer survivors completed the survey (median age 51, female 68%, Hispanic 37%, rural 33%). Survivors who reported a change in employment (n=236, 80%), were more likely to be Hispanic v. non-Hispanic white (OR 2.01, 95% CI 1.02, 3.96) or unmarried females v. married males (OR 3.80, 95% CI 1.40,10.3). In addition, survivors reporting a change in employment had, on average, a 7-point lower FWB score (estimate=-6.93, 95% CI -11.0,-2.78) after adjusting for age, comorbidities, marital status, and income. A reduction in productivity at work (n=223, 77%) was more common among unmarried females (OR 4.90, 95% CI 1.86, 13.0) and married females (OR 2.18, 95% CI 1.09, 4.35) compared to married males. In addition, survivors reporting a change in productivity had, on average, a 5-point lower current FWB score (estimate=-5.10, 95% CI -9.33,-0.88) than individuals who did not experience a change in productivity, adjusted for age, comorbidities, marital status and insurance. Disparities in the likelihood of changes in employment or productivity were not observed between rural and urban cancer survivors. Conclusion: Hispanic and female cancer survivors may be particularly vulnerable to negative employment outcomes following a cancer diagnosis. These disparities are important because changes in employment and productivity appear to have detrimental, long-term effects on FWB.

A115, PR09 Racial disparities in health insurance status of U.S. adults with hematologic malignancies in states with and without Medicaid expansion: Analyses from the National Cancer Database, 2007-2016. Gregory S Calip¹, Naomi Y Ko², Karen I Sweiss¹, Pritesh R Patel¹, Brian C-H Chiu³. ¹University of Illinois at Chicago, Chicago, IL, USA, ²Boston University School of Medicine, Boston, MA, USA, ³The University of Chicago, Chicago, IL, USA.

Introduction Lack of health insurance is an important determinant of cancer health disparities in the United States. For patients with hematologic malignancies, breakthroughs in novel chemotherapeutics, targeted therapies and stem cell transplantation are counterbalanced with concerns for financial toxicity and lack of access without adequate health coverage. Our objective was to measure racial differences in uninsured rates among patients with hematologic malignancies in states with and without Medicaid expansion under the Affordable Care Act. Methods We conducted a hospital-based retrospective cohort study of adults aged 40-64 years diagnosed with hematologic malignancies (lymphoma, multiple myeloma, leukemia and Waldenstrom macroglobulinemia) between 2007 and 2016 using the National Cancer Database (NCDB). We collected information on demographics, clinical characteristics, insurance coverage, socioeconomic factors and state Medicaid expansion status. We grouped Medicaid expansion states as: (i) non-expansion states; (ii) early expansion states (2010-2013); and (iii) late expansion states (2014-2016). Covariate adjusted difference-in-differences (DID) analyses were performed to determine changes in the percentage of uninsured hematologic malignancy patients over time. In modified Poisson regression models, we calculated adjusted rate ratios (RR) and 95% confidence intervals to identify disparities in uninsured rates among black, Hispanic and Asian/Pacific Islander (API) patients compared to white patients by time period and Medicaid expansion. Results An overall cohort of 338,353 hematologic malignancy patients (median age: 56 years; 43% female) residing in Medicaid non-expansion (n=124,875), early expansion (n=60,305) and late expansion (n=153,173) states were included. Compared to 2007-2009, the proportion of uninsured patients was lower in 2014-2016 across all states; however, more substantial decreases in percentage uninsured occurred in states with Medicaid expansion (4.9% to 2.5%, diff 2.4%) versus states without expansion (9.4% to 8.3%, diff 1.1%; DID -1.3, P<0.01). These reductions were consistent among white (DID -1.1, P<0.01) and Hispanic (DID -4.3, P<0.01) patients; however, decreases in uninsured rates among black (DID -0.3, P=0.67) and API (DID 1.9, P=0.41) patients were not statistically significant. Regardless of expansion status, racial disparities persisted

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over time with racial and ethnic minority patients having a 1.5- to 3.0-fold higher likelihood of being uninsured compared to white patients. Conclusions Our study found that the proportion of uninsured hematologic malignancy patients in the NCDB decreased between 2007 and 2016, but this reduction was significantly greater in states with Medicaid expansion. We also identified racial disparities where black and API patients experienced minimal decreases attributed to Medicaid expansion and black, Hispanic and API patients were consistently more likely to be uninsured over time.

A116 Occupational disparities in women's employment

after cancer. [Christine Ekenga](#)¹, Eunsun Kwon², BoRin Kim³, Sojung Park¹. ¹Washington University in St. Louis, St. Louis, MO, USA, ²St. Cloud State University, St. Cloud, MN, USA, ³University of New Hampshire, Durham, NH, USA.

Background: Due to advances in early diagnosis and treatment, the population of working-age cancer survivor population has grown. However, few studies have examined long-term (10+ years) employment outcomes after treatment. We evaluated the impact of cancer on employment outcomes among women enrolled in the Health and Retirement Study (HRS), a nationally representative panel of non-institutionalized adults aged 51 and older in the United States. Methods: Data came from nine waves of the HRS (1998-2014) (n = 7,088; Observations = 26,355). We conducted two sets of analyses: The first set of analyses examined the impact of cancer on employment status and the second set of analyses examined the impact of cancer on the number of work hours for women who were working full time (≥ 35 hours per typical work week) at baseline. For the analysis of employment status, we used a random intercept logistic regression in a multi-level growth curve framework to analyze change over time in likelihood of employment. For the analysis of hours of work per week, we used a mixed-effects coefficient regression to assess work hours trajectories in relation to cancer. Results: There were 7,088 working-age (51-64 years) women in the study sample. Approximately 7% (n=483) of the sample were cancer survivors, with a mean number of years since diagnosis of 9 years. After controlling for sociodemographic and health factors, women who were 6-10 year cancer survivors had a 2.3 times greater likelihood of being employed over time than women without a history of cancer; however, if these women had professional jobs, they were less likely to work over time (OR = 0.4) than professional women without a history of cancer. Long-term (10+ year) cancer survivors in professional occupations tended to work less hours per week at baseline (-4.1 hours) and over time (-2.4 hours) than professional women who

without a history of cancer. Conclusions: Professional women may be vulnerable to job loss after cancer treatment. Identifying factors associated with continued employment for women will be key to developing strategies to promoting quality survivorship in the growing cancer survivor population.

A117 Area deprivation index and rurality in relation to lung cancer prevalence and mortality in a rural state.

Kathleen M Fairfield¹, Adam Black¹, Erika Ziller², Kimberly Murray¹, Lee Lucas¹, Leo B Waterston¹, Neil Korsen¹, Darlene Ineza¹, [Paul KJ Han](#)¹. ¹Maine Medical Center, Portland, ME, USA, ²University of Southern Maine, Portland, ME, USA.

Objectives: Lung cancer is the leading cause of cancer-related mortality. In rural areas, socioeconomic deprivation and geographic barriers to care may both influence lung cancer prevalence and outcomes. We sought to describe how socioeconomic deprivation and rurality are related to lung cancer prevalence and mortality. Methods: We conducted a population-based cross-sectional analysis of: 1) prevalent lung cancers identified in a statewide all-payer claims dataset between 2012 and 2016; 2) lung cancer deaths in Maine from 2012-2016, ascertained by the state death registry; 3) rurality; and 4) area deprivation index (ADI), a geographic area-based measure of socioeconomic deprivation. Analyses examined rate ratios for lung cancer prevalence and mortality according to rurality (small/isolated rural, large rural, or urban) and ADI (in quintiles, with highest reflecting the most deprivation) and after adjusting for age, sex, and area-level smoking rates as determined by Behavioral Risk Factor Surveillance System data. Results: Among 1,223,006 adults aged 20+ in the all-payer claims dataset during the 5-year observation period, 8300 received care for prevalent lung cancer and there were 4618 deaths from lung cancer between 2012 and 2016. Of the prevalent lung cancer cases, 36.1% resided in isolated or small rural areas, and 42.6% resided in the highest two quintiles for ADI. Increasing rurality was positively associated with lung cancer prevalence and mortality, but these associations did not persist after adjusting for age, sex and smoking rates. However, increasing ADI was positively associated with both lung cancer prevalence (rate ratio 1.41 (95% CI 1.30-1.54) for ADI quintile 5 vs. quintile 1) and mortality (rate ratio for ADI quintile 5 vs. quintile 1, 1.59 (95% CI 1.41-1.79) in multivariable models adjusted for age, sex, and smoking rates. Conclusion: Socioeconomic deprivation was associated with higher lung cancer prevalence and mortality, but rurality was not. These findings suggest that interventions aimed at improving access to lung cancer prevention, screening, and treatment services should target populations with socioeconomic

deprivation, rather than rurality per se. Future research should examine the relationship between socioeconomic deprivation and other indicators of population health in rural areas.

A118 Work changes and predictors of decreased work participation among African American cancer survivors.

Theresa A Hastert, Mrudula Nair, Julia Mantey, Jennifer L Beebe-Dimmer, Stephanie Pandolfi, Tara E Baird, Ann G Schwartz. Wayne State University School of Medicine/ Karmanos Cancer Institute, Detroit, MI, USA.

Background: Cancer-related financial hardship is common and is associated with lower health-related quality of life, particularly among African American cancer survivors. Employment outcomes during and after cancer treatment may represent modifiable risk factors to reduce financial hardship and improve wellbeing among cancer survivors, but employment outcomes among African American survivors are not well understood. Methods: We utilized data from the Detroit Research on Cancer Survivors (ROCS) cohort. African American adults ages 20-79 were eligible to join the cohort if they were diagnosed with a first primary breast, colorectal, lung, or prostate cancer since January 1, 2013, as identified through the Metropolitan Detroit Cancer Surveillance System cancer registry. The present analyses include 445 survivors who reported being employed before their cancer diagnosis. We estimated prevalence of work-related outcomes, including changes to hours, duties, and schedules; and extended time off. We further estimated the prevalence and identified predictors of decreased work participation (going from being employed at diagnosis to not employed or from full time to part time employment) between diagnosis and ROCS baseline survey (median: 13 months) using modified Poisson regression. Adjusted models controlled for age, household income, and cancer site. Results: One-third (33%) of survivors reported taking at least one month off of work, including 19% who used paid sick time, 8% who used paid vacation, and 21% who took at least one month of unpaid time off. Changes to work schedules (46%), hours worked (40%), or work duties (25%) were also common. Nearly half (47%) of employed survivors experienced a decrease in work participation. A greater proportion of survivors employed full time before diagnosis reported being on disability at ROCS baseline compared with those employed part time (20.4% vs. 14.3%), while unemployment was more common among survivors employed part time before diagnosis (16.9% vs. 7.9%; $p < 0.001$). In adjusted models, older age (RR 65+ vs. <55: 1.5, 95% CI: 1.1, 1.9), lower income (RR \$80,000+ vs. <\$20,000: 0.3, 95%CI: 0.2, 0.4), cancer site (RR lung vs.

breast: 1.6, 95% CI: 1.2, 2.0; RR colorectal vs. breast: 1.3, 95% CI: 1.0, 1.7) and receipt of chemotherapy (RR: 1.4, 95% CI: 1.1, 1.8) were associated with decreased work participation, as were taking at least one month of unpaid time off (RR: 1.4, 95% CI: 1.1, 1.8) and changing work duties related to cancer (RR: 1.4, 95% CI: 1.1, 1.7). Conclusions: Our findings of strong associations between low household incomes and receipt of chemotherapy and decreased employment participation may represent opportunities to improve employment outcomes. Possible interventions focused on rehabilitation or additional policy or employer-level supports could improve employment outcomes among survivors at greatest risk for financial difficulties.

A119, PR16 Access to breast cancer survivorship care in a medically underserved region: Examining the role of non-medical providers. **Deborah Lefkowitz**. Independent Scholar, Riverside, CA, USA.

Background: The increasing number, and longevity, of breast cancer survivors in the US creates new challenges for survivorship care. Survivorship research has focused on medical and insurance providers but paid little attention to other actors integral to service delivery for breast cancer survivors, particularly in community settings outside of academic hospitals or comprehensive cancer centers. This study examined where, and how, breast cancer survivors accessed survivorship services in a medically underserved region of Southern California, and who were the providers of these services. Methods: Extensive recruitment efforts across California's two-county Inland Empire (Riverside and San Bernardino counties) enabled inclusion of a diverse group of breast cancer survivors (49% non-white, 12% monolingual Spanish speakers) from metropolitan areas, small towns, and desert communities. Open-ended, semi-structured interviews were audio-recorded with 82 survivors. These interviews focused on survivors' service needs, how connections with services were made, and where services were obtained. Interviews were also conducted with 84 service providers from 71 organizations, including legal services, financial assistance, patient navigation, prosthesis fitting, lymphedema care, nipple tattooing, nutrition counseling, medical interpreting, transportation, and psychosocial support. Detailed interview transcriptions were coded line-by-line, then analyzed inductively through an iterative process of testing and retesting interpretations against the empirical data, a practice derived from grounded theory. Results: In the Inland Empire community-based nonprofits enabled access for low-income, undocumented, un- and underinsured survivors who might not otherwise have obtained services

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such as patient navigation, lymphedema garments, mastectomy bras/prostheses, or psychosocial support. These same survivorship services were also provided in medical facilities. But in community-based nonprofits the services were free and typically provided by lay staff/volunteers, while in medical facilities the services were mostly fee-based and provided by licensed healthcare professionals. Conclusion: This qualitative study makes visible the contributions of non-medical providers that remain largely unacknowledged within discussions of survivorship care. It also raises concerns about survivor disparities that warrant further investigation. While quality of care has become a significant concern in oncology, there are no measures for comparing quality across the medical and non-medical settings where survivors obtain services. Filling service delivery gaps with non-medical providers enables access without guaranteeing comparable quality of services and may therefore perpetuate, or even exacerbate, disparities for the most vulnerable survivors. Funding: Research was supported by the National Cancer Institute of the National Institutes of Health under Award #F31CA192478.

A120 Financial well-being and quality of life following a cancer diagnosis: A focus on socioeconomic

disparities. [Jean A. McDougall](#)¹, Jessica Anderson², Shoshana Adler Jaffe¹, Charles L. Wiggins¹, Angela L. Meisner¹, Dolores D. Guest¹, Andrew L. Sussman¹, V. Shane Pankratz¹. ¹University of New Mexico Comprehensive Cancer Center, Albuquerque, NM, USA, ²Department of Internal Medicine, Albuquerque, NM, USA.

Background: Financial well-being (FWB) is defined by an individual's ability to fully meet current and ongoing financial obligations, secure their financial future, and make choices that allow them to enjoy life. High out-of-pocket costs, and lost income following a cancer diagnosis and treatment, are associated with negative financial outcomes for many cancer patients and their families. Unsurprisingly, those who start off with the fewest resources are particularly vulnerable to the financial shock of cancer. What is not known, however, is how FWB changes over time for socioeconomically vulnerable individuals or how changes in FWB following a cancer diagnosis are related to clinical outcomes. Methods: We conducted a cross-sectional survey of stage I-III breast, colorectal, and prostate cancer survivors, age 21-64 years, diagnosed between 2008 and 2016, and identified from the population-based New Mexico Tumor Registry. Participants were asked to recall their financial situation at three time points: 1) in the year prior to cancer diagnosis, 2) in the year post-diagnosis, and 3) at the time of the survey. FWB

was ascertained at all three of these time points using the validated Consumer Financial Protection Bureau Financial Well Being Scale (0-100; US Population Average=54) and mental and physical QoL were determined using PROMIS measures. Propensity score weighted multivariable linear regression was used to identify factors associated with changes in FWB over time and to estimate relationships between changes in FWB and mental and physical QoL. Results: A total of 394 cancer survivors completed the survey (response rate 33%; mean age 51y, mean time since diagnosis 6y, 42% Hispanic, 52% ≤ high school degree, 22% Medicaid-insured, 31% income <\$30,000, 33% rural). On average, FWB declined by 5 points (95% CI -6.17, -3.85) from the year before (mean 55, sd 14) to the year after (mean 50, sd 17) cancer diagnosis. Between the year post-diagnosis and the time of the survey (mean 53, sd 16), FWB scores increased by 3 points (95% CI 1.92, 3.98). However, cancer survivors with ≤high school degree had a significantly smaller improvement in their FWB than those with higher levels of education (estimate -2.37, 95% CI -4.44, -0.31). Importantly, each 1-point change in FWB from the year post diagnosis to the time of the survey was associated with higher mental (estimate 0.28; 95% CI 0.19-0.37) and physical (coefficient 0.19; 95% CI 0.13-0.25) QoL. Conclusion: Our data suggest that FWB declines in the year following a cancer diagnosis and rebounds thereafter. However, financial recovery is associated with important patient socioeconomic characteristics. Moreover, improvements in FWB between the year post diagnosis and the survey were associated with significant improvements in QoL. Targeted efforts to improve FWB in socioeconomically vulnerable cancer survivors, including those with lower levels of education, may be an effective strategy to reduce socioeconomic disparities in cancer outcomes that warrants further study.

A121 Effect of state Medicaid expansion status on insurance coverage and stage at diagnosis in head and neck cancer

patients. [Nosayaba Osazuwa-Peters](#)¹, Justin M Barnes¹, Eric Adjei Boakye², Matthew E Gaubatz¹, Kenton J Johnston³, Neelima Panth⁴, Rosh KV Sethi⁵, Uchechukwu Megwalu⁶, Mark A Varvares⁷. ¹Saint Louis University School of Medicine, St. Louis, MO, USA, ²Southern Illinois University School of Medicine, Springfield, IL, USA, ³Saint Louis University College for Public Health and Social Justice, St. Louis, MO, USA, ⁴Yale School of Medicine, New Haven, CT, USA, ⁵University of Michigan Medical School, Ann Arbor, MI, USA, ⁶Stanford University School of Medicine, Stanford, CA, USA, ⁷Harvard Medical School, Boston, MA, USA.

Objective: Access to care is an important issue for head and neck cancer (HNC) patients as HNC is one of the most expensive cancers, particularly for late stage disease. While some data show increased insurance coverage with Medicaid expansion, evidence is limited for impacts on socioeconomic disparities in insurance or on stage at diagnoses. This study aimed to quantify the impact of state Medicaid expansion status on insurance status and stage at diagnosis in HNC patients. Methods: Using a quasi-experimental design, the 2011-2015 Surveillance, Epidemiology, and End Results database was queried for adults with HNC in the United States. Changes in insurance coverage and stage at diagnosis after 2014 in states that expanded Medicaid (EXP) were compared to changes in states that did not expand Medicaid (NEXP). Difference-in-differences analyses were used to assess changes in the percentage of Medicaid coverage, uninsured, and early stage diagnoses in EXP relative to NEXP states. Results: A total of 26,330 HNC cases were identified. In difference-in-difference analyses, we observed an increase in Medicaid insurance in expansion relative to non-expansion states (3.36 percentage points (PP), 95% CI = 1.32, 5.41, $p=.001$), especially for residents of low income and education counties. We also observed a reduction in uninsured status among HNC patients in low income counties (-4.17 PP, 95% CI = -6.84, -1.51; $p=.002$). Additionally, we found significant increases among young adults age 18-34 years (17.2 PP, 95% CI = 1.34, 33.10, $p=0.034$), females (7.54 PP, 95% CI = 2.00, 13.10, $p=0.008$), unmarried patients (3.83 PP, 95% CI = 0.30, 7.35, $p=0.033$), and patients with cancer of the lip (13.5 PP, 95% CI = 2.67, 24.30, $p=0.015$). There was some evidence for greater expansion-associated increases in early stage diagnoses for non-Hispanic blacks (8.53 PP) and other races (20.4 PP) relative to white HNC patients ($p=.025$). Conclusions: Medicaid expansion is associated with improved insurance coverage for HNC patients, particularly those with low income, and increased early stage diagnoses for young adults and for racial/ethnic minorities. Thus, Medicaid expansion may improve access to care for patients with HNC. Our findings are particularly relevant at a time when there is debate in the United States about healthcare financing, Medicaid, and the Affordable Care Act.

A122 Socioeconomic influences on trastuzumab usage in underserved population from hilly regions of north India. Rajesh Pasricha, Pragya Singh, Ajas Ibrahim, Laxman Pandey, Ajeet Singh Bhadoria, Sweetly Gupta, Deepa Joseph, Manoj Gupta, Bina Ravi. All India Institute of Medical Sciences, Rishikesh, Rishikesh, Uttarakhand, India.

Breast cancer is the most common malignancy in women worldwide. Trastuzumab in combination with chemotherapy is the standard of care and essential drug for patients with Her2 positive breast cancer. Despite the availability of biosimilar, it is still out of reach for many patients in India. This study examines access to trastuzumab and identified potential barriers to its use in a large tertiary care hospital in an underserved and resource-restricted hilly region of Northern India. Material and methods In a cross-sectional study all patients diagnosed with Her2 positive breast cancer who underwent treatment from January -December 2018 were included. All relevant details like age, stage, treatment details, receptor status (ER/PR/ Her2) were recorded. These patients were investigated to look into various factors for acceptance or non -acceptance of trastuzumab like socio-economic status, funding of treatment, education status and reasons for non-usage of the drug. Patients were categorized into high, middle and lower socioeconomic status by using an appropriate scale. The data were analyzed using SPSS Version 20.0. A chi-square test of significance was applied to test the association between variables. Results 310 patients of carcinoma breast were included in the study. 68 patients were Her2 positive (22%). Of these 68 patients, 24 (35%) received trastuzumab. Most trastuzumab recipients belong to upper and middle socioeconomic status as compared to the lower class (83.3% vs 16.7%, $p=0.001$). The treatment of maximum (91.7%) users were met by out of pocket expenditure & two patients were beneficiary of government health schemes. Most users were well educated (above high school level) compared to those who did not take the drug (83% vs 36%, $p= 0.0001$). Among 44(65%) patients who did not receive the drug, the majority had education level below high school (63% vs 36%) despite high income (54% vs 37%). 26 (59%) patients reported the financial issue as the main cause of not taking trastuzumab whereas the remaining 18 (41%) patients cited the reason that they were not offered this drug by treating physicians. Except for two patients, all trastuzumab nonrecipient patients were also financing their treatment themselves. These two non-user patients with financial support from the government denied the use of trastuzumab due to personal reasons. Conclusions Most patients were unable to receive trastuzumab treatment due to financial constraints, non-availability of health insurance and poor government support for treatment. Patient's socioeconomic class, monthly income & their education level significantly influenced the usage of the drug. Treating oncologists should also overcome their personal biases about the socio-economic status of patients and should offer the drug wherever indicated. Improvement in education standard raises the socioeconomic status as well as disease awareness among the patient which would make them vigilant and

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receptive to life-saving beneficial but costly treatment like trastuzumab.

A123 Legislation by states and its impact on factors causing divergence in HPV vaccination coverage: Analysis of 2013-2017 National Immunization Survey - Teens (NIS-TEENS). Radhika Ranganathan, Peyin Hung, Swann Arp Adams, Nicole L Hair, Shiba Simon Bailey. University of South Carolina, Columbia, SC, USA.

Background: Human papilloma virus (HPV) is strongly associated with multiple cancer types, affecting women, men and children of all races, ethnicities and backgrounds. HPV causes more than 30,000 cases of cancer every year and more than 70% of U.S population will experience at-least one HPV infection at some point. School-entry mandates and public health education campaigns though being separate entities, have significantly increased vaccine uptake, reduced disease prevalence and decreased racial disparities in disease rates. Furthermore, improvements in immunization against HPV are not equally distributed across gender, age, demographic and socioeconomic divisions within the recommended group of vaccine recipients. Objectives: To analyze and report the association between state-level policies and HPV vaccination uptake. We further explore predictors of HPV vaccination uptake using Aday & Anderson's behavioral theory of healthcare utilization. Methods: A repeated cross-sectional survey of NIS-Teens data from 2013-2017 was used for the analysis. Bivariable associations and multivariable ordered logistic regression models were statistically performed using STATA 15/IC & SAS v9.4. Results: HPV vaccination completion rates were 17% higher in teens who lived in states with a legislative mandate irrespective of policy enactment. Relative to males, females had 72% higher odds of uptake. Compared to whites, Non-Hispanic blacks had a 21% lower odds of vaccination uptake. Compared to western region of the US, the north-east region reported 1.47 times higher odds of HPV vaccination. Provider recommendation was also significantly associated with HPV vaccination coverage rates. Conclusion: State legislative mandates had a profound impact of vaccination uptake. Additionally, racial minorities were significantly less likely to receive vaccination. Analysis of statewide adaptation of policy related bills and federal funding on VFC (Vaccine For Children) program could further inform those policy initiatives with the greatest uptake of vaccination.

A124 Neighborhood, race and insurance predict for hospital admission during radiation therapy. Daniel V. Wakefield¹, Matthew Carnell², Bo Jiang¹, Austin Dove³, Wesley Garner¹, Drucilla Edmonston¹, Adam Hubler², Esra Ozdenerol⁴, Ryan Hanson⁴, Maria Pisu⁵, David L Schwartz¹, David L Schwartz⁶. ¹University of Tennessee Health Science Center - Department of Radiation Oncology, Memphis, TN, USA, ²University of Tennessee Health Science Center - College of Medicine, Memphis, TN, USA, ³Vanderbilt University - Department of Radiation Oncology, Nashville, TN, USA, ⁴University of Memphis - Department of Earth Sciences, Memphis, TN, USA, ⁵University of Alabama Birmingham - Division of Preventive Medicine, Birmingham, AL, USA, ⁶University of Tennessee Health Science Center - Department of Preventive Medicine, Memphis, TN, USA.

Background: Hospital admission during radiotherapy (ADRT) is associated with increased cost, interrupted treatment, and inferior outcomes. The purpose of this study was to benchmark patient ADRT rates, define socioeconomic predictors for ADRT, and geographically map ADRT rates on the neighborhood level across a large Mid-Southern catchment region served by a single academic cancer referral center. Methods: Demographic, clinical and treatment information were collected for all patients treated with radiation therapy (RT) at our center from January 1, 2015 to December 31, 2017. Occurrence of ADRT included inpatient and emergency room admissions. ADRT was categorized as causing "minor interruption" if ADRT was associated with postponement in 1-4 RT treatments. "Major interruption" was defined as postponement in 5 or more treatments. Patients with Medicaid or no insurance were categorized as "At-Risk". Patient predicted income (PPI) was modeled using 2017 US Census data for annual household income by patient residence census tract, categorized into low (<\$34k), middle, and high (>\$67k) thirds. ADRT rates were compared across variables, analyzed using Pearson's Chi square testing, and geomapped by patient residence at the neighborhood (census tract) level. Results: 3,729 patients were included. 2,032 (54.5%) were Caucasian, 1,577 African American (42.3%), and 120 (3.2%) other. Insurance status was defined as Commercial, Medicare, or At Risk in 1,794 (48.1%), 1,503 (40.3%), and 432 (11.6%) patients. The mean PPI was \$49,951 (range \$10,871-\$177,857). A total of 83,306 fractions (median 24, IQR 11-30) were delivered with 7,107 (8.5%) total interruptions. 727 interruptions (mean 0.19, range 0-21) were due to ADRT in 197 patients (5.3%). Minor interruption rates were significantly elevated in At Risk patients v. those with Commercial or Medicare insurance (7.4% v 3.5% p<0.0001; OR 2.21 [95%CI 1.47-3.31]), African American v. Caucasian patients (5.1% v 3.1% p=0.002; OR 1.66 [95%CI 1.19-2.32]),

and low PPI v. high PPI patients (5.2% v 2.5% $p < 0.0005$; OR 2.17 [95%CI 1.39-3.39]). Major interruption rates were similar across all groups: At Risk v. Commercial or Medicare insurance (1.6% v 1.2% $p = 0.591$; OR 1.25 [95%CI 0.55-2.79]), African American v. Caucasian ([1.3% v 1.4% $p = 0.74$; OR 0.91 [95%CI 0.51-1.61]), and low PPI v. high PPI (1.4% v 1.3% $p = 0.93$; OR 1.03 [95%CI 0.52-2.05]). Elevated minor interruption rates were geographically associated with low income, predominately African American neighborhoods across our treatment region. Conclusion: At our high-volume academic radiotherapy practice, hospital admission during RT correlated significantly with uninsured or Medicaid coverage status, African American race, and low predicted income and mapped to low income neighborhoods, suggesting limited care access for these populations. Major hotspot locations have been identified, setting the stage for targeted studies to close gaps in RT quality.

A125 The impact of the 2010 Patient Protection and Affordable Care Act (ACA) on colorectal cancer screening in vulnerable populations: A systematic literature review.

Joshua S Yudkin¹, V. Paul Doria-Rose². ¹University of Texas Health Science Center, Dallas, Texas, USA, ²National Cancer Institute, Rockville, MD, USA.

Background: Disparities have existed and continue to exist in colorectal cancer (CRC) screening. Disparities in screening are correlated with other factors including educational attainment, healthcare access/insurance, and family history knowledge. These factors impact different vulnerable communities differently. This paper explores the impact of the 2010 Patient Protection and Affordable Care Act (ACA) on CRC screening rates and disparities in the United States. Methods: A comprehensive systematic literature review conducted in June 2019 revealed 47 published articles that explore the impact of the ACA on CRC screening. Results: The ACA affected CRC screening primarily in three ways: 1) costs associated with screening and diagnostic follow-up were reduced among commercially-insured patients, removing financial barriers; 2) uninsured, non-Medicaid-eligible individuals were able to gain access to healthcare services such as CRC screening through insurance plans purchased through health exchanges; and 3) vulnerable and high-risk populations gained access through the expansion of and changes to Medicaid in 32 states. These three pathways reduced screening disparities between various ethnic and racial populations, yet disparities remain. Conclusions: The ACA expanded access to screening and treatment efforts in order to decrease cancer incidence, increase early detection, decrease costly CRC management, and extend

life expectancy for CRC survivors. Yet, the limited literature shows mixed results in terms of the ACA's impact, especially in its initial phase. While screening technologies and systemic changes by the ACA have made significant progress in reaching high-risk and vulnerable populations including ethnic and racial minorities, there is still a concerning gap in both access to CRC screening services and the associated disparities in mortality. Future research should focus on delayed impacts of the ACA.

A126 Rural-urban differences in breast reconstruction utilization following mastectomy.

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Background: Healthcare disparities in rural women are well-defined, however little is known about breast reconstruction (BR) utilization in this population, especially rural Kentucky. The goal of this study was to determine if disparities in BR exist among post-mastectomy rural female patients in Kentucky. Methods: The Kentucky Cancer Registry was used to identify patients diagnosed with breast cancer and treated with mastectomy from 2006-2015. Patients were subdivided into mastectomy-only and mastectomy plus BR groups. 2013 Beale codes were used to stratify patients according to urban, near-metro or rural status. Chi-square tests were used to examine the association of BR along the rural-urban continuum. A multivariate logistic regression model controlling for patient, disease and treatment factors was used to predict BR. The likelihood of undergoing BR was reported in odds ratios (OR) using a 95% confidence interval (CI). Results: Overall, 12,036 patients underwent mastectomy. Of these patients, 2,822 (23.4%) also underwent BR. The rate of BR among urban, near-metro and rural patients was 32.4%, 23.1% and 14.7%, respectively. Multivariate analysis revealed that women from near metro (OR 0.56, CI 0.50-0.63; $p < 0.001$) and rural areas (OR 0.38, CI 0.33-0.43; $p < 0.001$) were less likely to undergo BR than women from urban areas. Conclusion: Although BR benefits are well documented, women from rural areas undergo BR at lower rates and are less likely to receive BR than their urban and near-metro counterparts. While multiple factors contribute to this disparity, future efforts should seek to improve comprehensive breast cancer care which includes access to a reconstructive breast surgeon.

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A127 Medicare restricts coverage of genetic testing. Verinda Hobbs. FORCE: Facing Our Risk of Cancer Empowered, Paterson, USA.

This poster will discuss the Medicare to National Coverage Determinations (NCD) for Next Generation Sequencing (NGS) for Medicare Beneficiaries with Advanced Cancer. The change to NCD will impact access to necessary screenings of people within specific communities most at risk for hereditary cancers; all age groups, men and women but specifically people of color with BRCA 1 and BRCA 2 gene mutations. Germline mutations are associated with increased risk of a variety of cancers and confer significant risk of increased morbidity and additional primary cancers. Without access to genetic testing, the possibility of identifying the “familial component” of cancer increases, resulting in late diagnoses, complicating and creating difficult treatment decisions and potentially affecting the prognosis. The NCD should strive to provide reasonable and necessary care that aligns with current evidence based guidelines and medicine. Germline tests should be covered, are important diagnostic tools that identify specific mutations’ this knowledge can provide physicians the benefit of clinically actionable interventions.

A128 Building sustainable partnerships between cancer centers and safety net community hospitals to increase access to and quality of cancer care. Vida Henderson¹, Jessica Madrigal¹, Jeanette Gonzalez¹, Erica Martinez¹, Katherine Tossas-Milligan¹, Patricia Doykos², Karriem Watson¹, Robert Winn¹. ¹University of Illinois Cancer Center, Chicago, USA, ²Bristol Myers Squibb Foundation, Princeton, USA.

Background: Cervical cancer outcomes are influenced by race, socioeconomic status and region. African American women have the highest mortality rate from cervical cancer and Hispanic and American Indian/Alaska Native women have the highest cervical cancer incidence rates among racial/ethnic groups. Disparities in cervical cancer can be greatly improved by increasing access to and awareness of Pap screening and HPV vaccination among vulnerable populations. Safety net and community hospitals offer broader opportunities to reach at-risk individuals, however these hospitals face many challenges that mirror those of the patients they serve, including: decreased access to innovative research and treatment, decreased access to the full range of specialty care, and funding challenges. Public-Public partnerships between academic medical centers, cancer centers and private service organizations that extend to safety net and community hospitals can increase cervical cancer screening rates among individuals at greatest risk. Methods: The Loretto Hospital and Norwegian American

Hospital serve communities that suffer the highest cervical cancer mortality rates in Chicago. Funded by the Bristol Myers Squibb Foundation, the University of Illinois Cancer Center partnered with these two community hospitals located on the west sides of Chicago to increase cervical cancer screening rates through clinical and community patient navigation. Evidence based methods such as small media interventions, client reminders, and one-on-one education will also be used to increase screening awareness and education. The evidence-based, implementation science program is guided by the RE-AIM framework. Reach, adoption and sustainability will be maximized through the integration of community hubs that comprise faith-, community-, school-based organizations and policy makers. Results: The project is a three year project. Now in its pre-implementation phase, the program is currently piloting data instrumentation and implementation processes. Preliminary results will be presented at the meeting. The Partnership development phase has been achieved and Full implementation will begin August 2019. Conclusion: It is expected that building partnerships between large academic medical centers, cancer centers and community hospitals will increase the capacity of community hospitals to offer quality screening and specialized care to community members and increase access to cervical cancer screening and education among at-risk populations ultimately decreasing cervical cancer disparities among underserved populations in the University of Illinois Cancer Center catchment.

A129 Racial/ethnic disparities in patient experiences with health care and the association with earlier stage at colorectal cancer diagnosis: Findings from the SEER-CAHPS data. Carol Y Ochoa, Gabriela Toledo, Albert J Farias. University of Southern California, Los Angeles, CA, USA.

Background: Racial/ethnic minorities are more likely to be diagnosed at a later stage of colorectal cancer (CRC). Disparities in late-stage CRC diagnosis are partly attributed to socioeconomic inequalities, poor access to early detection screening and poor access to timely, high-quality diagnostic care. Although these findings are useful for identifying subgroups at high-risk for late-stage CRC diagnosis, few studies have focused on potentially modifiable factors at the patient, healthcare system and provider-level. Therefore, our objective was to identify whether racial/ethnic differences in patient experiences with healthcare are associated with stage at CRC diagnosis. Methods: We used the NCI Surveillance, Epidemiology and End Results (SEER) registry data linked with patient surveys from the Consumer Assessment of Healthcare Providers and Systems (CAHPS). CAHPS

surveys are administered to a random sample of Medicare beneficiaries on fee-for-service or Medicare advantage health plans by the Centers for Medicaid and Medicare Services. We conducted a retrospective cohort analysis of patients >64 years old diagnosed with colorectal cancer from 1997-2011 who completed a CAHPS survey prior to the date of their CRC diagnosis. We examined the composite measures from CAHPS survey to assess patient experiences with care which we categorized into three domains: 1) patient-centeredness, 2) timeliness, and 3) realized access. Race/ethnicity was assessed using a self-reported measure from the CAHPS survey. We used multivariable linear regression to examine racial/ethnic differences in patient experiences with care for each domain controlling for sociodemographic and health characteristics. We ran a multivariable logistic regression model to determine the association between patient experiences with care and earlier stage (stage 0 and 1) at diagnosis. Results: Of the 9,211 patients, 79.7% were non-Hispanic white, 7.7% black, 7.4% Hispanic, and 5.2% Asian. After controlling for potential confounders, for the timeliness of care domain, Asian patients had significantly lower adjusted mean scores for getting care quickly (B=-6.65, 95% CI: -9.44, -3.87) compared to white patients. While for the realized access domain, Asian and non-Hispanic black patients had significantly lower adjusted mean scores for getting needed prescription drugs, B=-5.78 (95% CI: -8.51, -3.05) and B=-3.18 (95% CI: -5.50, -0.87), respectively. More importantly, we found that black patients who reported a 5-unit increase in rating of their experiences with getting needed care quickly (OR: 1.06, 95% CI: 1.01-1.10) had higher odds of being diagnosed at an earlier stage of colorectal cancer. Conclusion: There are racial/ethnic disparities in patient experiences with timeliness of and realized access to care preceding a diagnosis of colorectal cancer. Our study suggests that among black patients, poor experiences with timeliness of care may be associated with later stage at diagnosis.

A130 Provider patient-sharing networks reduce colorectal cancer time-to-treatment: What is their relationship to survival? Melody K Schiaffino¹, Vinit Nalawade², Holly Shakya², James D Murphy². ¹San Diego State University, San Diego, CA, USA, ²University of California-San Diego, San Diego, CA, USA.

Timely coordination of appropriate care is the current obsession of medical centers intent on delivering the greatest value to consumers of health services. Addressing the delivery of right care at the right time in the right place has been driving an over haul of the U.S. health care delivery

system since the 2010 signing of the Patient Protection and Affordable Healthcare Act . The focus has been primarily on offering massive incentives for linking the fragmented segments of primary, secondary, and tertiary care across the gaping silos that have become our new norm. Much of this work lies at the feed of provider-provider incentives, effort, and communication. The purpose of the present study was to assess the role of provider to provider patient referral relationships. We want to determine whether these interpersonal interactions, that imply increased interaction, shared information exchange, and knowledge and expertise, also result in better outcomes for the patients that are in them. We used data from the 2004-2011 SEER-Medicare data set with permission, additional measures were gleaned with permission from the CMS Medicare PUF and the American Hospital Association Annual Database (2014). We had a final sample for analysis of N=27689. We calculated patient-sharing as the number of patients seen by the same diagnosing and treating provider within in the last 3 years. Most shared 1 patient, or were part of the reference group as not sharing. We also developed a measure of care-coordination to assess the effect of the diagnosing and treating provider being co-located on mortality. Kaplan Meier and cumulative incidence functions were calculated as well as Fine-Grey competing risk analysis of mortality from [not cancer] to ensure we accounted for variability. All analyses were conducted on SAS 9,4 (Cary, N.C.). We found providers that had moderate patient-sharing (2-6 patients) or strong (more than 6 shared patients) had HR under 1.00, compared to providers with only 1 referral from diagnosing to treating provider or no patient-sharing. Only when comparing no patient-sharing against moderate patient-sharing was a statistically significant hazard of death observed in the moderate group between the diagnosing and treating providers (HR 1.08, 95CI 1.02-1.14). We also found significant HR of 1.14 (p=.0010) that for risk of death compared to White patients. This exploratory look at SEER-Medicare data is a valuable foray into assessing the potential of massive administrative data to address the growing population of the U.S that is aging and in need of appropriate support to ensure optimal treatment and survival outcomes.

A131 Understanding financial toxicities and disparities associated with treating colorectal cancer in the minority community. Wenora Johnson. Fight Colorectal Cancer, Joliet, IL, USA.

Understanding financial toxicities and disparities associated with colorectal cancer in the minority community.

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A132, PR10 Emergency department-mediated cancer diagnosis in the United States. [Caroline A Thompson](#)¹, Paige Sheridan², James D Murphy², Georgios Lyratzopoulos³. ¹San Diego State University, San Diego, CA, USA, ²University of California San Diego, San Diego, CA, USA, ³University College London, London, United Kingdom.

Background: It is estimated that 20-50% of breast, colon and lung cancers are diagnosed in an emergency department (ED) globally. Cancer diagnosis via the ED increases time-to-treatment, worsens short-term survival and reduces quality of care. Studies in Europe have shown that older, racially diverse and socioeconomically deprived patients are at a higher risk of ED diagnosis. However, no studies in the U.S. have reported patterns of cancer patients initially presenting to the ED. We identified and characterized patients who were diagnosed with a malignant tumor following presentation to an ED using data from the Surveillance, Epidemiology and End Results (SEER) Medicare linked database. Methods: We studied 415,395 Medicare beneficiaries with histologically confirmed first malignant invasive tumors of the breast, colon and rectum, lung and prostate between 2004 and 2013. Patients were excluded if they did not have continuous coverage in the year prior to diagnosis, had more than one primary tumor, or were diagnosed after death. ED-mediated diagnosis was defined as having at least one ED claim in the month before the date of cancer diagnosis. Covariate adjusted generalized linear models were used to estimate prevalence odds ratios for race/ethnicity, comorbidity, and income levels. A secondary analysis examined associations stratified by the presence of an outpatient clinic visit in the year prior to diagnosis as a proxy for having any usual source of care. Results: Overall, 42,186 (11%) of cancer diagnoses were ED-mediated (by site: breast: 5%, colorectal: 13%, lung: 15%, prostate: 6%). Patients presenting to the ED were more likely to be: unmarried (OR:1.32; 95% CI: 1.29-1.34), Hispanic (OR:1.47; 95% CI: 1.37-1.57) or Black (OR:1.41; 95% CI:1.37-1.45), have 3+ comorbidities (OR:3.08; 95% CI: 3.00-3.16), and in the lowest income quartile (OR:1.26; 95% CI:1.21-1.30). In stratified analyses income was more strongly associated with emergent presentation among patients with no usual source of care. Conclusions: This is the first study to describe patterns and predictors of ED-mediated cancer diagnosis in the U.S. We found that minority patients and those with lower SES were more likely to present with cancer via the ED. While some cancers diagnosed in the ED may indicate incidental findings, later stage symptomatic cancers not identified until they become an emergency may reflect the failure of public health campaigns and primary care services. Reducing emergency presentation of cancer patients may improve patient outcomes and healthcare system efficiency. Further research is needed to uncover symptomatic

and incidental pathways to diagnosis and to identify targets for interventions.

A133 Comparison of radiation therapy initiation timelines among varied referral streams to identify sources of delay. [Melody J Xu](#)¹, Sumi Sinha¹, Sunny Wang², Terence Friedlander³, Steve E Braunstein¹. ¹University of California San Francisco, San Francisco, CA, USA, ²San Francisco Veterans Affairs Medical Center, San Francisco, CA, USA, ³Zuckerberg San Francisco General, San Francisco, CA, USA.

Purpose/Objective(s): Tertiary radiation oncology centers receive referrals from diverse care settings, including private facilities, Veteran's Affairs (VA) hospitals, and county hospitals. An exploratory study of county patients treated at our institution identified that each missed consult or simulation (sim) appointment was associated with a greater than three-week delay from referral to radiation (RT) start. We sought to validate this in a larger sample and compared RT referral-to-start timelines for a variety of referral streams. Materials and Methods: Up to 60 consecutively referred patients from each facility (internal health system, VA, county hospital, and external private facilities) between June to December 2018 were included. Primary disease site, interpreter requirements, and dates of referral, consultation, sim, and RT start were recorded. Linear regression and analysis of variance models were developed to identify variables associated with delays in RT. Results: Of 214 patients were included; 55 (26%) internal, 53 (25%) from the VA, 60 (29%) from the county hospital, and 46 (22%) from other facilities. Among the 33 patients requiring interpreters, 28 (85%) were county patients. The most common referrals were for genitourinary (GU) cancers (n = 63, 29%), followed by breast (n = 29, 14%), lung (n = 26, 12%), and head and neck (n = 21, 10%) cancers. The median days from referral to consult was 16 (IQR 7-28), with the shortest time to consult for bone (1.5 days, IQR 1-5) and central nervous system sites (5 days, IQR 3-9) and the longest for gynecologic cancers (21.5 days, IQR 8.5-44). Excluding GU patients, who often require two months of neoadjuvant hormone therapy prior to RT, the median days from consult to sim was 13 (IQR 6-20) with no significant differences in referral to consult or consult to sim by referring facility. In all patients, the median days from sim to RT start was 8 (IQR 6-14) with no significant differences by referral facility. In univariate analysis among non-GU patients, referring facility and requirement of an interpreter were not associated with referral-to-start delays; only missing one or more consult/sim appointments was significant (p < 0.001). Each missed appointment was associated with a 37-day delay (95% CI 26 - 48) in referral-to-start. Conclusion:

In a patient cohort with heterogeneous cancer diagnoses, no facility-specific delays were identified despite county hospital patients having known socioeconomic vulnerability. Efforts to decrease RT delays may require department-wide, as opposed to interfacility, interventions. Future goals involve using site-specific referral-to-start benchmarks (e.g. one week for palliation and 10 weeks for GU) to further discriminate differences.

A134 Minority women with non-endometrioid endometrial cancer are not less likely to receive guideline-concordant treatment than White women. [Jhalak Dholakia](#)¹, Elyse Reamer², Ritu Salani³, Ashley Felix². ¹The Ohio State University Dept of Obstetrics and Gynecology, Columbus, OH, USA, ²The Ohio State University Division of Epidemiology, Columbus, OH, USA, ³The Ohio State University Division of Gynecologic Oncology, Columbus, OH, USA.

Background: Black women with endometrial cancer (EC) experience significant disparities in treatment and survival. They undergo diagnostic evaluation, primary surgical management, and non-surgical treatment at statistically lower rates than non-Hispanic White (NHW) women. Black women are also more likely to present with advanced stage disease and aggressive tumor histology, including non-endometrioid EC subtypes, resulting in a 93% greater overall mortality rate than Whites. Research in other cancers show that Black patients receive guideline-concordant care less often than NHW women. To date, no study has assessed the relationship between race and receipt of comprehensive guideline-concordant therapy, nor have studies examined the impact of guideline-concordant treatment and survival according to race among women with EC. We investigated these associations among women diagnosed with non-endometrioid EC in the National Cancer Database. Methods: Our analysis included 21,696 NHW, 6,859 non-Hispanic Black (NHB), 1,752 Hispanic, and 922 Asian/Pacific Islander (AS/PI) women diagnosed with non-endometrioid EC between 2004 and 2014. We used year-specific National Comprehensive Cancer Network (NCCN) guidelines to classify treatment as guideline-concordant vs. not concordant. We used multivariable logistic regression to estimate odds ratios (OR) and 95% confidence intervals (CIs) for the association between race and receipt of guideline-concordant treatment in models adjusted for age at diagnosis, stage, histology, comorbidity score, insurance type, and facility type. We used multivariable-adjusted Cox proportional hazards models to estimate hazards ratios (HRs) and 95% CIs for relationships between receipt of guideline-concordant treatment and overall survival stratified by race. Results: In the overall study

population, 38.2% of women with non-endometrioid EC received NCCN guideline-concordant treatment. Compared to NHW women, NHB women (OR=1.05, 95% CI=0.99 to 1.11), Hispanic women (OR=1.10, 95% CI=0.99 to 1.23) and AS/PI women (OR=1.11, 95% CI=0.97 to 1.28) did not have significantly different odds of receiving guideline-concordant treatment in multivariable-adjusted models. Receipt of guideline-concordant treatment was significantly associated with improved survival among NHW (HR=0.84, 95% CI=0.80 to 0.87), NHB (HR=0.86, 95% CI=0.80 to 0.92), and Hispanic women (HR=0.85, 95% CI=0.72 to 1.00) but not among AS/PI women (HR=0.88, 95% CI=0.71 to 1.10). Conclusions: Almost two-thirds of women with non-endometrioid EC may not receive guideline-concordant treatment. We observed no difference in receipt of concordant care between racial groups. When received, guideline-concordant treatment was associated with improved survival in almost all racial groups. Therefore, instituting interventions to improve adherence to guideline-concordant treatment may contribute to reducing racial disparities in survival for women with non-endometrioid EC.

A135 A cost-effectiveness analysis of trastuzumab-containing treatment sequences for HER-2 positive metastatic breast cancer patients in Taiwan. [Vakaramoko Diaby](#)¹, Hussain Alqhtani¹, Sascha van Boemmel-Wegmann¹, Ching-Yu Wang¹, Askal Ali², Rajesh Balkrishnan³, Yu Ko⁴, Sofia Palacio⁵, Gilberto de Lima Lopes de Lima Lopes⁶. ¹Department of Pharmaceutical Outcomes and Policy, University of Florida, Gainesville, FL, USA, ²ESAP College of Pharmacy, Florida A&M University, Tallahassee, FL, USA, ³University of Virginia School of Medicine, Charlottesville, VA, USA, ⁴College of Pharmacy Taipei Medical University, Taipei City, Taiwan, ⁵Department of Medicine, University of Miami Miller School of Medicine and Sylvester Comprehensive Cancer Center, Miami, FL, USA, ⁶Sylvester Comprehensive Cancer Center at the University of Miami and the Miller School of Medicine, Miami, FL, USA.

Objective. Treatment options for HER-2-positive metastatic breast cancer (mBC) patients have expanded markedly since trastuzumab approval in 1998. Several other regimens are now available, including pertuzumab plus trastuzumab plus docetaxel, T-DM1, capecitabine plus lapatinib, and trastuzumab plus lapatinib. This study assesses the cost-effectiveness of four treatment sequences for HER-2-positive mBC according to the Taiwanese National Health Insurance Administration (TNHIA). Methods. Lifetime costs (2017 U.S. Dollars) and effectiveness (quality-adjusted life years) of treatment decisions for HER-2-positive mBC

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patients were examined using a Markov model. Transition probabilities, disease progression, and probability of adverse events and survival were derived from clinical trial data. Costs and health utilities were estimated from TNHIA, Taipei Medical University Hospital, and the literature. Deterministic, probabilistic sensitivity analyses and a scenario analysis examined parameter uncertainty and accounted for drug wastage in dosage and cost calculations. Results. Sequence 3 (1st line: trastuzumab plus docetaxel; 2nd line: T-DM1; 3rd line: trastuzumab plus lapatinib) was the most cost-effective sequence followed by sequence 1 (1st line: pertuzumab plus trastuzumab plus docetaxel; 2nd line: T-DM1; 3rd line: capecitabine plus lapatinib), and sequence 4 (1st line: trastuzumab plus docetaxel; 2nd line: trastuzumab plus lapatinib; 3rd line: trastuzumab plus capecitabine), respectively. The model was sensitive to costs and transition probabilities, but not particularly sensitive to the wastage assumption. Conclusions. From the perspective of the TNHIA, using trastuzumab plus docetaxel as 1st line followed by T-DM1 and trastuzumab plus lapatinib as 2nd and 3rd line yields the most cost-effective strategy for treating HER-2-positive mBC patients.

A136 Racial disparities in delayed initiation of adjuvant endocrine therapy among patients with breast cancer. Kimberley T Lee¹, Vered Stearns², Lisa K Jacobs¹. ¹Johns Hopkins University, Baltimore, MD, USA, ²Johns Hopkins University, Baltimore, MD, USA.

Adjuvant endocrine therapy (AET) is associated with significant improvements in disease-free and overall survival for patients with hormone receptor positive (HR+) breast cancer and guidelines recommend initiation of AET within 12 months of diagnosis. Black women with HR+ breast cancer have poorer overall survival than their white counterparts and breast cancer is the leading cause of cancer death for Hispanic women. We aim to describe the relationship between race/ethnicity and prolonged time to AET and identify other predictors of delayed AET. This is a retrospective, population-based cohort study using the National Cancer Database, which captures more than 70% of incident cancer cases in the US. We examined 249,761 women who were diagnosed with invasive stage IB to III, HR+, HER2- breast cancer between 2004 and 2014, had cancer-directed surgery, and who were prescribed AET. Time to AET was defined as time from breast cancer diagnosis to initiation of AET. Delayed AET was defined as more than 12 months from date of breast cancer diagnosis. Multivariable logistic regression models were used to identify predictors of delayed AET. Eighty percent (186,197) of women were white,

-10% (22,841) were black, and 5% (12,101) were Hispanic. Among all patients, mean age at diagnosis was 58.5 years, 29% were diagnosed with stage IB, 43% with stage II, and 27% with stage III cancer, and median time to initiation of AET was 6.1 months. Mean age of black and Hispanic women at diagnosis was 56.4 and 53.9 years respectively, compared to 59.2 years for white women. Fourteen and 20% of black and Hispanic patients were insured by Medicaid, respectively, versus 4.4% of white women. Black and Hispanic women had almost twice the odds of delayed time from diagnosis to surgery compared to white women (OR 1.78, 95% CI 1.73-1.83 and OR 1.93, 95% CI 1.86-2.01, respectively). In univariate analyses, factors associated with delayed AET were black and Hispanic race/ethnicity, being uninsured or having Medicaid, older age (categorized as > 70 years-), higher tumor grade or stage, receipt of chemotherapy or radiation therapy, and delayed time to surgery or chemotherapy. Our final multivariable model adjusted for these significant factors, as well as comorbidities, urban/rural residence, and income and education (based on zip-code). In this model, being uninsured was no longer positively associated with delay in AET. Black patients had a 19% higher odds of delayed AET (OR 1.19, 95% CI 1.14-1.24) and Hispanic patients had 57% higher odds of delay compared to their white counterparts (OR 1.57, 95% CI 1.49-1.65). There are racial disparities in the quality of breast cancer care provided to patients in this study. Being of black or Hispanic race/ethnicity was associated with increased odds of delayed time to initiating AET beyond the recommended time frame of 12 months after diagnosis. Medicaid enrollment was also a predictor of delayed time to AET. Future efforts should be focused on improving delivery of quality breast cancer care measures to vulnerable populations.

A137 Impact of provider delay in early stage breast cancer on outcomes across public health services in Southeast Brazil and Harris Health Texas. Maryam Nemati Shafae¹, Leonardo Roberto Silva², Susana Ramalho², Jose Bines³, Max Senna Mano⁴, Gustavo Zucca Matthes⁵, Cesar Cabello⁶, Spiridon Tsavachidis¹, Matthew J Ellis⁷, Rulla Tamimi⁸, Melissa L Bondy¹. ¹Baylor College of Medicine, Dan L Duncan Cancer Center, Houston, TX, USA, ²Division of Gynecological and Mammary Oncology, Women's Hospital Dr. Jose Aristomedo Pinotti (CAISM) of UNICAMP, Campinas, Brazil, ³Instituto Nacional do Câncer (INCA), Rio de Janeiro, Brazil, ⁴Hospital Sírío Libanês, São Paulo, Brazil, ⁵Cancer Hospital of Barretos, São Paulo, Brazil, ⁶Dr. Jose Aristodemo Pinotti Women's Hospital (CAISM/UNICAMP), São Paulo, Brazil, ⁷Baylor College of Medicine - Lester and Sue Smith Breast Center, Houston, TX, USA, ⁸Harvard T.H Chan School of Public Health,

Department of Epidemiology, Boston, MA, USA .

Background: Delays in diagnosis and treatment of early stage breast cancer is associated with increased rate of recurrence and death. Delays are classified as either patient delay (time from symptoms to diagnosis), or provider delay (time from diagnosis to therapy). Delays of 12 weeks from diagnosis to therapy have been associated with increased risk of death in breast cancer. It is unknown whether provider delay is a contributing factor to the poor outcomes of breast cancer for patients with low socioeconomic status (SES) in the US or Brazil. **Methods:** We conducted a retrospective analysis of two cohorts of women with early stage breast cancer who are of low SES; diagnosed between Jan 1, 2009 - Dec 31, 2011 with stages I-III breast cancer across Harris County safety-net hospitals, Texas and three hospitals that serve low income populations in Southeast Brazil, São Paulo and Rio de Janeiro. We defined poor outcome as risk of breast cancer recurrence or death within 5 years from diagnosis. We conducted Cox proportional hazards regression to evaluate association of time from diagnosis to initiation of treatment (surgical or systemic therapy) in 2-week intervals, and risk of recurrence or death. We adjusted the model for age, breast cancer subtypes (Luminal, HER2-overexpressing, triple negative (TNBC)), location (Texas vs. Southeast Brazil) and stage. An adjusted logistic regression analysis evaluated the effect of treatment delay of 12 weeks on recurrence or death. We computed the Fisher exact test, and Mann-Whitney test to compare the cohorts. **Results:** We reviewed a total of 1,191 cases (n=963 Brazil, n=228 Texas). Compared to Texas, patients in Southeast Brazil were older at diagnosis (mean age 56.6 years vs. 53.4 years, $p < 0.01$), less frequently diagnosed with stage I (31% vs. 40%), and more frequently diagnosed with stage III (21.1% vs. 32.3%). The time from diagnosis to first therapy was similar between the cohorts – median 9.9 weeks Brazil vs. 9.4 weeks Texas ($p = 0.14$). The five-year recurrence rates were 21.2 in Southeast Brazil and 22.8% in Texas ($p = 0.6$). Compared with stage I, stage II (HR 3.5, 95% CI 1.8-8.6), and stage III (HR 7.6, 95% CI 4.5-13.6) were associated with higher recurrence or death in both populations. TN status was associated with higher rate of recurrence among the Texas population (HR 5.6, 95% CI 1.9-16.6), but not the Brazil cohort (HR 1.17 95% CI (0.7-2.0)). Results of Cox's proportional hazards regression, or binary variable logistic regression showed that provider delay was not associated with higher rate of recurrence or death from breast cancer in either population. **Conclusions:** Patients in Southeast Brazil were older at diagnosis of breast cancer, and more frequently diagnosed with stage III compared to the Texas population. Time from diagnosis to initiation of therapy was similar across the two cohorts. Provider delay was not

associated with increased rate of recurrence or death among patients with low SES accessing safety net hospitals in Texas or in Southeast Brazil.

A138 Evaluating medication adherence of oral endocrine therapy among breast cancer survivors in a large academic medical center.

Rutugandha Paranjpe¹, Grace Hwang², Carine Opsomer³, Kelvin Lu³, Uzo Abajue⁴, Hanna Zaghoul², Susan Abughosh⁵, Meghana Trivedi⁵. ¹University of Houston, Houston, TX, USA, ²Houston Methodist Hospital, Houston, TX, USA,, ³University of Houston, Houston Methodist Hospital, Houston, TX, USA, ⁴University of Houston, Texas Southern University College of Pharmacy, Houston, TX, USA, ⁵University of Houston, Houston, TX, USA.

Introduction: Clinical guidelines suggest maximum benefit of oral endocrine therapy (OET) for hormone receptor-positive breast cancer (HR+ BC) when taken for five to ten years. Despite benefits of improved outcomes, more than half of the breast cancer survivors are non-adherent to OET. The objective of this study was to evaluate the adherence of OET for HR+ BC survivors of different race and ethnicity at 6- and 12-months using Houston Methodist Hospital (HMH) electronic medical records (EMRs). **Methods:** A single-center, retrospective, observational study was conducted. EMRs were collected for survivors with OET prescriptions at the HMH outpatient center from May 2018 through December 2018. Adherence rates using proportion of days covered (PDC) were calculated at 6- and 12-months interval. Adherence was defined as $PDC \geq 0.8$ while non-adherence was defined as $PDC < 0.8$ and was the outcome variable. Descriptive statistics were conducted, and differences between adherent and non-adherent groups were assessed using chi-square and student's t-tests. Separate multivariable logistic regression models were used to assess the predictors of adherence at 6 and 12 months controlling for demographic and clinical characteristics. These included age, ethnicity, cancer stage, type of endocrine therapy, duration of therapy, and switch of therapy. **Results:** A total of 338 survivors on OET were identified. At 6-months, 82% of survivors (n=277) were adherent. At both 6-and 12 months the adherent group mainly comprised of Caucasians (68%) and African American (14-16%) survivors. In the multivariable logistic model for 6-months, survivors on tamoxifen were 52% less likely to be adherent to OET as compared to survivors on aromatase inhibitors (OR 0.48; 95% CI 0.24-0.95). Similarly, survivors on OET therapy for 3-5 years were significantly associated with lower adherence as compared to survivors on OET therapy for less than or equal to 2 years (OR 0.29; 95% CI 0.09-0.91). Although not significant, survivors of Hispanic

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origin were less likely to be adherent to OET as compared African Americans (OR 0.37; 95% CI 0.12-1.09). Of the 237 survivors included in the 12 months analysis, 78.9% (n=187) were adherent at 12 months. None of the variables showed a significant association with adherence at 12 months due to smaller sample size. Conclusion: Adherence rates decreased from 6-to 12 months. Type of OET therapy and duration of therapy were significantly associated with adherence at 6-months. Future longer-term multi-center studies with more patients from diverse ethnicity, race, and socioeconomic status will elucidate mechanisms of cancer health disparity in OET adherence.

A139 Volume and quality in head and neck cancer. Ari D Schuman¹, Andrew J Rosko², Scott E Regenbogen³, Steven B Chinn². ¹University of Michigan Medical School, Ann Arbor, MI, USA, ²Department of Otolaryngology-Head and Neck Surgery, University of Michigan, Ann Arbor, MI, USA, ³Department of Surgery, University of Michigan, Ann Arbor, MI, USA.

INTRODUCTION: There has been significant interest in the relationship between hospital volume and outcomes across fields. However, the relationship between hospital volume, established quality metrics, and survival has not been established for head and neck cancer. We investigated the relationship between hospital volume and outcomes for head and neck cancer. **METHODS:** Using the National Cancer Database (2004-2016) data for upper aerodigestive tract squamous cell carcinoma, hospital volume deciles were determined. Univariate log-rank analysis was used to determine volume thresholds with significantly different overall survival (OS). The primary outcome measure was overall survival; other outcomes included complete neck dissection (≥ 18 lymph nodes removed), negative margins, and time to adjuvant radiation < 6 weeks. Statistical analysis was performed using multivariable logistic regression and Cox proportional hazards models. **RESULTS:** Data from 270,047 patients and 1325 facilities were analyzed. Volume thresholds were: fewer than 22 cases per year (lowest volume), 22-38 cases per year (low-moderate volume), 38-122 cases per year (moderate volume), 122-160 cases per year (high-moderate volume), and 160 or more cases per year (highest volume). There was a positive trend in the adjusted odds ratio of complete neck dissection compared to moderate volume (OR range 0.53-1.52 from lowest to highest volume, p-for-trend < 0.0001). There was also a positive trend in the odds of negative margins with increasing volume (OR range 0.85-1.45 lowest-highest, p-for-trend < 0.0001). All centers had similar odds for time to post-operative radiation less than six weeks.

Unadjusted five year OS was 52.3% in the lowest volume, 52.9% in the low-moderate volume, 54.4% in the moderate volume, 56.0% in the high-moderate volume, and 57.6% in the highest volume group. Cox proportional hazards models showed decreased survival in the lowest (HR 1.10, 99% CI 1.05-1.15, p < 0.001) and low-moderate volume groups (HR 1.07, 99% CI 1.02-1.13, p < 0.001) compared to moderate volume, and a protective effect in the higher volume groups (high-moderate volume HR 0.95, 99% CI 0.86-1.05, p=0.23; highest volume HR 0.94, 99% CI 0.87-1.01, p=0.04). The same trend was present when data were stratified by anatomical site. Among those who initially received non-surgical treatment, the lowest and low-moderate volume groups had significantly lower survival compared to moderate volume. However, the non-surgical high-moderate and highest volume groups were not significantly different from moderate volume. No groups significantly differed among patients who had surgery first. **CONCLUSION:** This study of a nationally representative database confirms the volume-outcome relationship for all head and neck cancer treatment and shows that surgical quality metrics are associated with hospital volume. When stratified by treatment type, volume was associated with overall survival for patients who had non-surgical treatment as their initial course.

A140 Factors associated with receipt of guideline-concordant treatment among Medicaid enrollees with breast and colorectal cancer. Jennifer Tsui¹, Derek DeLia², Jose Nova³, Antoinette Stroup⁴, Dawn L. Hershman⁵, Joel Cantor³. ¹Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA, ²MedStar Health Research Institute, Hyattsville, MD, USA, ³Rutgers Center for State Health Policy, New Brunswick, NJ, USA, ⁴New Jersey State Cancer Registry, Trenton, NJ, USA, ⁵Columbia University Medical Center, New York, NY, USA.

Purpose: Medicaid enrollees with cancer are less likely to receive treatment consistent with established guidelines. It remains unclear what specific factors are associated with non-receipt or delays in guideline-concordant cancer care among Medicaid patients. In this study, we examine receipt of guideline-concordant Medicaid enrollees with breast or colorectal cancer. **Methods:** We linked data from the New Jersey State Cancer Registry and Medicaid claims and encounter files for patients diagnosed with a first primary breast (BC) or colorectal (CRC) cancer from 2011-2015. We assess guideline-concordant treatment using National Comprehensive Cancer Network and American Society of Clinical Oncology criteria, which include endocrine therapy within 1 year, radiation therapy within 1 year, and

adjuvant chemotherapy within 120 days for BC patients; and, postoperative chemotherapy within 9 months, radiation therapy within 6 months, and adjuvant chemotherapy within 4 months for CRC patients that fit the specific clinical criteria for each guideline. For each guideline, patients were placed in one of the three categories: 1.) on-time concordant care, 2.) delayed concordant care, 3.) non-receipt of concordant care. Delayed concordant care included patients with guideline-directed care outside of the indicated timeframe. We used multivariate ordinal logistic regression to determine the independent effects of demographic, health care utilization, and Medicaid enrollment factors on the 3-level concordance measure. Results: Rates of guideline concordant care were: 69.5% for BC endocrine therapy, 63.4% for BC radiation therapy, 76.4% for BC adjuvant chemotherapy, 69.4% for CRC postoperative chemotherapy, 91.9% for CRC radiation therapy, and 68.4% for CRC adjuvant chemotherapy. An additional 10.1% of BC patients received delayed care for endocrine therapy. An additional 14.1% of CRC patients received delayed care for postoperative chemotherapy. Ordinal logit models showed BC patients enrolled through the New Jersey Cancer Education and Early Detection program had a 29.3 percentage point higher probability of on-time care for endocrine therapy compared to women not enrolled through the program ($p < 0.001$). CRC patients enrolled in managed care compared to fee-for-service had a 44 percentage point higher probability for receiving guideline concordant adjuvant chemotherapy ($p < 0.001$). For a subset of BC and CRC guidelines we observed Hispanic patients had lower probability of receiving delayed or non-concordant care compared to NH-White patients ($p < 0.05$). Conclusions: We identified several demographic and enrollment predictors of delayed guideline-concordant treatment for low-income cancer patients. These findings can inform providers to prioritize the targeting of care management resources for patients at high risk for not meeting treatment guidelines and highlight.

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B001 Rural interventions to improve breast, cervical and colorectal screening rates: Recruitment strategies for women in rural areas. Ryan D Baltic¹, Gregory S Young¹, Mira L Katz¹, Susan Rawl², Victoria Champion², Electra D Paskett¹. ¹The Ohio State University, Columbus, OH, USA, ²Indiana University, Indianapolis, IN, USA.

Rural areas of the United States have less access to quality healthcare, higher rates of cancer incidence and mortality, and lower screening rates compared to urban areas. The Rural Interventions for Screening Effectiveness (RISE) Study conducted by Indiana University and The Ohio State University focuses on improving breast, cervical and colorectal cancer screening rates in rural Indiana and Ohio by encouraging female residents ages 50-74 years to receive necessary screenings. Two interventions are tested: an interactive DVD, and the DVD combined with patient navigation. Recruitment occurred October 2017 - June 2019. This paper evaluates recruitment strategies used by RISE in order to better understand which method was most effective and to determine if participants differed demographically by recruitment method. An array of recruitment strategies were used, including purchasing contact lists to call women in the recruitment area, internet advertising, and physical advertisements placed within the communities. Outbound mailing and calling, the sole method initially planned, was performed for the first 6 months of recruitment, using purchased phone and address lists of female residents of rural counties of northeast Indiana and northwest Ohio. Internet advertising was primarily conducted using Facebook to target female users 50 years or older in rural areas of both states. Community advertising was performed by mailing flyers to be displayed in rural libraries, senior and community centers, and other locations where residents congregate. Recruitment strategies differed in effort, cost, and yield. Mailing and calling using purchased lists was used to attempt to reach 5240 women, successfully reaching and reviewing medical records for 275 women, yielding 154 eligible women. Median household income of these women was \$50,000-\$59,999 and median age was 63 years. This strategy was costly, high effort, and did not yield enough participants to warrant continuing. Community advertising involved identifying suitable locations and requesting permission to post promotional materials. Although this strategy's reach cannot be determined, 163 women contacted staff to request more information, 67 progressed to medical record review, and 38 were enrolled. Median household income of these participants was \$70,000-\$79,999 and median age was 62 years. Through Internet advertising, 3116 spoke to interviewers about the study, with 1297 progressing to medical record review, yielding 793 eligible participants.

Median household income was \$70,000-\$79,999; median age was 58 years. Although Internet recruitment was the most successful strategy, it may have unintentionally targeted younger or more affluent women who own and use smartphones or home computers with internet access. With technology becoming increasingly pervasive and as people become more hesitant to answer phone calls from foreign numbers, recruitment strategies must be evaluated to ensure the study population is truly being reached.

B002 Restoring Balance, a physical activity intervention for Native cancer survivors, preliminary analysis

(NRR.14.192). Jennifer W Bea¹, Hendrik de Heer², Taylor Lane², Brenda Charley², Etta Yazzie¹, Jennifer Hudson², Mishayla Mitchell², Betsy Wertheim¹, Anna Schwartz². ¹University of Arizona Cancer Center, Tucson, AZ, USA, ²Northern Arizona University, Flagstaff, AZ, USA.

Physical activity has been shown to improve quality of life, body composition, metabolic and physical function, and survival among cancer survivors. However, no studies have focused on Native American cancer survivors. Methods: Native cancer survivors and family members were enrolled in a 12-week multi-site, randomized supervised and home-based physical activity intervention (n = 63). The intervention includes 1d/wk supervised resistance, aerobic, flexibility, and balance and 2-3 days/wk of home-based exercise. National guidelines for survivorship exercise training were culturally tailored based focus groups and interviews, as well as cultural expert program review by representatives from 10 tribes. Preliminary descriptive statistics (mean, SD) and six and twelve week changes in weight (kg), fat mass (%), HbA1c (%), fitness by 6min walk test (meters), and quality of life by PROMIS10 questionnaire score have been assessed by paired t-test for survivors only (n = 30). Though currently under powered, data collection is ongoing and will be updated as participants complete the 12-week intervention. Results: Participants were 58.4 ± 12.2 years of age. Tumor types were breast (n = 7), colorectal (n = 7), stomach (n = 2), lung (n = 2), and other varied cancers. Reasons for loss to follow-up were: repeat surgeries or change in clinical care plan (n=3), loss of family members (n=1), and loss of contact (n=3). Comorbidities for cancer survivors included: diabetes (n=7), cardiovascular disease (N=13). Twenty-two Native cancer survivors have completed six weeks of intervention and 14 Native cancer survivors have completed twelve weeks of intervention thus far. Weight loss was significant at six weeks (-1.0 ± 2.2kg; p=0.04), but not twelve weeks. Fitness and quality of life were improved by twelve weeks, 31.9 ± 132m and 1.6±0.4, respectively, though not significant. Conclusions:

Tailored exercise programs present opportunities to restore health and balance among Native cancer survivors. This ongoing trial will provide important information on the effects of physical activity in Native cancer survivorship, unaddressed to date.

B003 The Geographic Management of Cancer Health Disparities Program “CURE Tour”: Increasing awareness of the NCI Continuing Umbrella of Research Experiences Program through outreach to Historically Black Colleges and Universities. Mabinty Conteh¹, James Zabora¹, Laundette Jones², [Mark Cromo](#)³, Julia Houston⁴. ¹Sidney Kimmel Comprehensive Cancer Center; Johns Hopkins University, Baltimore, MD, USA, ²University of Maryland School of Medicine, Baltimore, MD, USA, ³Markey Cancer Center; University of Kentucky, Lexington, KY, USA, ⁴Arnold School of Public Health; University of South Carolina, Columbia, SC, USA.

Introduction: The Geographic Management of Cancer Health Disparities Program (GMaP) Region 1 North (R1N) is one of seven NCI GMaP Regional “hubs”, covering the states of KY, ME, MD, NH, VA, VT, WV and DC. A primary goal of GMaP R1N is to facilitate the career development of the next generation of underrepresented cancer researchers by promoting and increasing applications to the NCI Continuing Umbrella of Research Experiences (CURE) Program. CURE provides funded training opportunities to students at all career levels to ensure a continuum of career development opportunities in cancer health disparities (CHD) research. CURE is an underutilized option for training for underrepresented minority (URM) students interested in CHD research. GMaP R1N developed and piloted an outreach program targeted to Historically Black Colleges and Universities (HBCUs) with the goal of increasing interest in CHD research and increasing awareness of CURE among HBCU students. Methods: GMaP R1N staff conducted a series of planning calls with NCI GMaP staff to develop a customizable agenda for HBCU pilot events. The group decided on the name “CURE Tour” for branding purposes for promotion and advertising. The agenda for the events included: a) presentation from an experienced CHD researcher; b) presentation from a former CURE trainee regarding his/her experiences; c) introduction to the GMaP Program; and d) knowledge quiz about presentation content (with prizes for winners). GMaP R1N staff developed relationships with staff at HBCUs for promotion of the events and logistics. Pilot “CURE Tour” events were implemented in the spring of 2019. Results: A total of 99 students attended three “CURE Tour” pilot events at Delaware State University (n=38); Coppin State University

(n=44); and Morgan State University (n=17). Approximately 98% of attendees were undergraduate students with 2% graduate/doctoral students. Students (n=81) completed post-event surveys. 98% reported learning something new about CHD/CURE that they did not know previously. 92% responded that the event was engaging; 63% expressed interest in CHD research; 66% said they were interested in applying for CURE funding; 96% said they would tell a friend about the event; and 90% reported that they would participate in a future event. Conclusions: The GMaP R1N “CURE Tour” pilot was effective at reaching a primarily undergraduate population of URM students at HBCUs who are interested in CHD research careers. All “CURE Tour” attendees will be tracked in the future regarding CURE funding and CHD careers. The agenda for the “CURE Tour” events was successful in keeping students engaged and providing new information to them regarding CHD research and CURE. Based on the success of the pilot, the same methods will be followed in developing future “CURE Tour” events at other HBCUs. In addition, materials and methods can be used to replicate “CURE Tour” events in other GMaP Regions and for other URM student populations.

B004 Capacity development among patient navigators to enhance colorectal cancer control in American Indian-serving healthcare facilities in the U.S. Southwest and Southern Plains. [Kevin C English](#)¹, Cheyenne Jim¹, Jennifer Hatcher², Mark P Doescher³, Shiraz I Mishra⁴, Peter Lance², Dorothy Rhoades³, Usha Menon⁵. ¹Albuquerque Area Indian Health Board, Inc., Albuquerque, NM, USA, ²University of Arizona, Phoenix, AZ, USA, ³Oklahoma University Health Sciences Center, Oklahoma City, OK, USA, ⁴University of New Mexico, Albuquerque, NM, USA, ⁵University of South Florida, Tampa, FL, USA.

According to the Institute of Medicine’s National Cancer Policy Forum, the American Cancer Society, and the National Cancer Institute, cancer screening programs are partly responsible for declining colorectal cancer (CRC) incidence and mortality rates in the U.S. Unfortunately, American Indians (AIs) have experienced either no change or an increase in CRC incidence and mortality, disproportionate diagnosis of late stage disease and poorer survival. While, nearly two-thirds of U.S. adults are current with United States Preventive Services Task Force (USPSTF) guidelines for CRC screening, AI screening rates range from only 28% to 51% in the Southwest and Southern Plains regions. One evidence-based intervention strategy for increasing CRC screening recommended by the Community Preventive Services Task Force (CPSTF) is patient navigation. By offering

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interpretation, transportation, social support, and culturally and linguistically appropriate education and outreach, patient navigators are able to reduce structural barriers and facilitate access to screening. While researchers have documented effectiveness of patient navigation towards enhancing cancer screening among AI populations, few studies have elucidated best practices for training patient navigators to serve in this capacity. As an effort of the AI CRC Screening Consortium formed by the National Cancer Institute-Designated Cancer Centers at the Universities of Arizona, New Mexico, and Oklahoma, we trained a cadre of 21 individuals to serve as patient navigators in six unique AI-serving health clinics and communities in Oklahoma, Arizona, and New Mexico. We used a unique blend of didactic and interactive training components (i.e. role playing, games, and group dialogues). The 2.5-day curriculum centered upon a set of nine modules that included digestive system anatomy, USPSTF CRC screening guidelines, stool-based test procedures, direct visualization test procedures, CRC risk factors, CRC diagnosis and treatment, Transtheoretical Model and Motivational Interviewing, and patient navigation tips. A 36-item pre-/post-test was administered to assess the impact of training upon navigator capacity. Paired-sample t-tests were utilized to analyze mean differences in scales measuring two key constructs – CRC-specific knowledge and self-efficacy to engage in CRC control efforts. Evaluation findings demonstrated statistically significant increases in both CRC knowledge scores (pre-test mean = 7.8/12.0 vs. post-test mean 10.9/12.0, $p=0.000$) and self-efficacy scores (pre-test mean = 3.8/5.0 vs. post-test mean = 4.8/5.0, $p=0.001$). These findings demonstrate the value of robust capacity development activities with patient navigators prior to intervention as a means of not only increase knowledge about CRC and its associated screenings, but to also engender significant readiness and confidence among patient navigators to integrate CRC control into practice.

B005 Development of a multi-component implementation strategy to deliver reproductive health care to Latina and geographically remote AYA cancer survivors on the US-Mexico border. Helina Hoyt¹, Helen Palomino², Beverly Carlson¹, H. Irene Su³. ¹San Diego State University, Callexico, CA, USA, ²Cancer Resource Center of the Desert, El Centro, CA, USA, ³University of California San Diego, San Diego, CA, USA.

Introduction: Reproductive health is a major issue for adolescent and young adult (AYA) cancer survivors because of the higher risks of adverse reproductive outcomes, including infertility, spontaneous abortion, and preterm birth. Multiple barriers prevent implementation

of reproductive health care to mitigate risks, especially in Latina and geographically remote communities. The objective is to develop a multi-component implementation strategy for this context. Methods: An investigator team including complementary research, community engagement, and healthcare workforce training experts was formed. Investigators reviewed published barriers and facilitators to reproductive health care in AYA survivors, candidate implementation strategies, inclusive of mobile health strategies, and community specific needs to generate candidate implementation tools. An implementation science framework was chosen to evaluate strategies and the context for improving reproductive health care for cancer survivors in Imperial County, a medically underserved and rural US-Mexico border region. Results: A collaboration was formed among the nursing school at San Diego State University, the community-based patient navigation program Cancer Resource Center of the Desert, and the comprehensive cancer center at the University of California San Diego, in order to pool expertise in community engagement, nurse workforce training, Imperial Valley patient navigation, medical oncology, reproductive medicine and implementation science. The investigators selected three implementation strategies to address known barriers in this region: 1) a culturally appropriate reproductive risk summary and survivorship care plan in English and Spanish to meet AYA survivor and healthcare provider knowledge gaps; 2) facilitation of care across health care systems via patient navigation; and 3) changing the location of clinical service sites, connecting rural, community based-setting with specialized care, via telehealth reproductive consultation. Guided by the Consolidated Framework of Implementation Research (CFIR), a mixed methods approach has been planned to evaluate the implementation interventions, the inner context at clinical sites, individuals (AYA survivors, navigators, nurses, physicians), and outer context (insurance coverage, community philanthropy). Conclusion: A systematic evaluation guided by an implementation science framework will generate a multi-component implementation strategy to deliver reproductive health care to Latina and geographically remote AYA cancer survivors.

B006 Developing Men Moving Forward, a lifestyle intervention for African American prostate cancer survivors. Jamal A. Jarrett¹, Lauren Matthews¹, Patricia Sheean², Kathryn Flynn¹, Kathryn Bylow¹, Deepak Kilari¹, Paula Papanek³, Tina Johnson¹, Melinda Stolley¹. ¹Medical College of Wisconsin, Milwaukee, WI, United States, ²Loyola University Chicago, Maywood, IL, United States, ³Marquette University, Milwaukee, WI, United States.

African American men are disproportionately affected by high prostate cancer incidence and mortality, and also comorbidities. African American prostate cancer survivors (AAPCS) report lower quality of life (QOL) relative to Non-Hispanic white (NHW) survivors. Many factors drive these differences, including weight status and health behaviors. The American Cancer Society has nutrition and physical activity guidelines to help cancer survivors achieve optimal health and QOL. AAPCS are more likely than NHW survivors to be non-adherent. Poor diet and physical inactivity often result in adverse body composition (high adiposity, low lean muscle) leading to hormonal changes, increased systemic inflammation and insulin resistance theorized to promote carcinogenesis and chronic diseases. Studies document positive results for lifestyle interventions focusing on NHW prostate cancer survivors, but inclusion of AAPCS is limited. We conducted an exploratory mixed methods study with AAPCS to inform the development and implementation of Men Moving Forward, a lifestyle intervention currently being tested in a randomized efficacy trial. Methods: 22 AAPCS completed a focus group and validated questionnaires on diet, physical activity patterns, QOL, and unmet needs related to lifestyle changes. Results: 75% of the participants were overweight/obese, 82% were considered insufficiently active, only 10% engaged in resistance training. Diets were high in saturated fat and sugar, low in fiber, fruits and vegetables. Compared to other prostate cancer survivors, AAPCS reported lower rankings on all QOL domains. Compared to the general population, men had worse physical functioning, pain interference, and sexual functioning. Qualitative data reflected high interest in a lifestyle intervention that would provide opportunities to build strength, learn about healthy eating, and bring men together to talk about relevant survivorship issues. Conclusions: Interventions are needed to address the lifestyle and QOL needs of AAPCS. The community-based Men Moving Forward trial will examine the feasibility and effects of a 4-month lifestyle program with 200 AAPCS. Outcomes include body composition (adiposity, lean muscle mass), behavior (diet, physical activity), strength, biomarkers of general health (lipids, blood pressure, glucose, and insulin) and prostate cancer recurrence (inflammation, insulin resistance, hormones) and QOL. This study is being conducted in partnership with the Milwaukee Public Recreation system which increases the potential for program sustainability.

B007 Developing community-primary care-specialty care partnerships to address cancer disparities in Asian Americans, Native Hawaiians, and Pacific Islanders. Priscilla Ko¹, Patricia Doykos¹, Moon Chen², Scarlett Lin Gomez³,

Neal Palafox⁴, Sora Park Tanjasiri⁵. ¹Bristol-Myers Squibb Foundation, Lawrence Township, NJ, USA, ²University of California Davis Comprehensive Cancer Center, Sacramento, CA, USA, ³University of California San Francisco, San Francisco, CA, USA, ⁴University of Hawai'i John A. Burns School of Medicine, Honolulu, HI, USA, ⁵University of California Irvine Chao Family Comprehensive Cancer Center, Irvine, CA, USA.

Cancer continues to be the leading cause of death in Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPIs), with over one-third of the AANHPI population residing in California and Hawai'i. Due to linguistic, cultural, and sociodemographic differences, cancer prevention, control, and treatment remains a challenge. These compounded factors hinder AANHPIs from seeking care or following through with provider's recommendations as they experience high level of dissatisfaction in care, risk of misdiagnosis or ineffective treatment plans, resulting in low levels of engagement with the healthcare system. This has called for a need to create partnerships and improve coordination between community, primary care, and specialty care. The Bristol-Myers Squibb Foundation's Specialty Care for Vulnerable Populations initiative addresses inequities in access to and utilization of specialty care services by medically underserved and vulnerable populations in the US. The goal of this national initiative is to catalyze sustainable improvement and expansion of specialty care and health service delivery by safety net providers for people at high risk of cancer and cardiovascular disease. In response to the cancer disparities and inequities faced by AANHPI populations, the Bristol-Myers Squibb Foundation's Specialty Care for Vulnerable Populations awarded 4 organizations \$750,000 each to support 3 year health service delivery demonstration projects to improve access to quality cancer care, patient engagement, and supportive services to AANHPIs. Objectives for this session will be: • Describe the cancer disparities in Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPIs) • Explain current research and new partnerships to improve cancer outcomes and access for AANHPIs • Disseminate different models of care bolstering community, primary care, and specialty care in AANHPI cancer patients This session will delve into the cancer disparities apparent in AANHPIs and highlight the 4 AANHPI-dedicated projects to create better coordination between community, primary care, and specialty care: 1. University of California Davis Cancer Center/Health & Life Organization 2. University of California San Francisco 3. University of California Irvine Chao Family Comprehensive Cancer Center 4. University of Hawai'i John A. Burns School of Family Medicine These projects include forming new partnerships

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between a NCI comprehensive cancer center + FQHC-lookalike; testing an in-person and virtual patient navigation portal; utilizing a hub-and-spoke model between primary care, FQHCs, and specialty care; and bolstering telehealth capabilities to train workers in USAPI territories and Hawai'i on cancer topics and services.

B008 Implementing electronic health records-based intervention tools in a large NYC healthcare system to facilitate *H. pylori* eradication strategies for gastric cancer prevention for at-risk Chinese American immigrant patients. [Simona Kwon](#)¹, Yi-Ling Tan², Janet Pan¹, Devin Mann¹, Sara Chokshi¹, Renee Williams¹, QiuQu Zhao³, Benyam Hailu⁴, Chau Trinh-Shevrin¹. ¹NYU School of Medicine, New York, NY, USA, ²NYU School of Medicine, New York, NY, USA, ³NYU Langone Health, New York, NY, USA, ⁴NIH, Bethesda, NY, USA.

Background: Gastric cancer is the third most common cause of cancer mortality worldwide. Chinese Americans experience a disproportionate burden of gastric cancer mortality. The bacterium *Helicobacter pylori* (*H. pylori*) is the strongest risk factor for gastric cancer; *H. pylori* eradication through triple antibiotic therapy is the most effective prevention method. Clinician adherence to the American College of Gastroenterology *H. pylori* treatment guidelines is not high. Medication adherence to the complex treatment regimen is challenging, especially for Chinese New Yorkers for whom 61% have limited English proficiency and low health literacy. Purpose of the Study: Working with an advisory coalition of community and health care safety net provider stakeholders, we developed a health-systems level intervention using electronic health record (EHR)-based tools to facilitate *H. pylori* treatment strategies for gastric cancer prevention. Methods: We used a mixed methods approach to inform EHR tool development, including: 1) a comprehensive scoping review of the peer reviewed and grey literature on gastric cancer prevention programs for Chinese Americans; 2) 4 site workflow analyses, which consisted of ethnographic observations and key informant interviews with 5 providers for contextual data on organizational workflow, culture and practice; and 3) 15 key informant interviews with community-based stakeholders and former patients. Results: Findings indicated the lack of culturally and linguistically tailored *H. pylori* and gastric cancer prevention materials. Using an iterative process, we developed 3 EHR-based tools: 1) a *H. pylori* medication order set for the most common first and second-line therapies; 2) basic health education materials for the patient in English and Chinese; and 3) a follow-up reminder for testing in 2 months to the patient's primary care

physician. Barriers and facilitators to implementation will be shared, including findings from utilization reports on patterns of use. Conclusion: There is a need to integrate system-wide EHR-based tools for underserved, vulnerable communities to enhance and sustain evidence-based practices for treatment adherence and cancer prevention to reduce *H. pylori*-related gastric cancer disparities for high-risk populations.

B009 ¡Salud!, por la Vida, an educational intervention to increase colorectal cancer screening in Puerto Ricans. Vivian Colón-López¹, Camille Vélez-Alamo², Adrianna Acevedo-Fontanez³, Marievelisse Soto-Salgado³, Jorge L Rodríguez-Lebrón³, [Josheili Y Llavona-Ortiz](#)³, Yolanda Serra-Martínez³, Ileska Valencia-Torres⁴, María Fernández⁴. ¹University of Puerto Rico- Medical Sciences Campus; Comprehensive Cancer Center, San Juan, PR, USA, ²University of Puerto Rico- Medical Sciences Campus; Carlos Albizu University, San Juan, PR, USA, ³University of Puerto Rico- Medical Sciences Campus, San Juan, PR, USA, ⁴University of Texas, Houston, TX, USA.

From 2010-2014, colorectal cancer (CRC) was the second highest incident cancer and leading cause of cancer-related deaths in Puerto Rico (PR). Although preventable through screening and treatment, colorectal cancer screening (CRCS) using fecal occult blood test (FOBT) or colonoscopy remains low for adults in PR. Data from the 2016 Behavioral Risk Factor Surveillance System indicated that 18.0% of the PR population aged 50 to 75 had undergone an FOBT within the past year compared to 8.0% in the United States (US). Additionally, 50.1% of age-eligible Puerto Ricans report ever having a colonoscopy in the past 10 years compared to 63.5% in the US. Given the higher burden of CRC and the low CRCS rates in PR, we developed ¡Salud!, por la Vida (SPLV), an educational program which aims to increase CRCS in non-adherent men and women aged 50 and 75 who attend Federally Qualified Health Clinics (FQHCs) in PR. We used Intervention Mapping (IM) as framework to develop an educational intervention that is theoretically sound and grounded in evidence. For the development of SPLV, steps 1 to 4 of IM were completed. Step 1: a needs assessment conducted through focus groups and key informant interviews to gather quantitative and qualitative data for the development of the logic model and the program; step 2: development of a logic model of change and matrices of change objectives; step 3: selection of theory and evidence-based methods and strategies; and step 4: program production, components, and materials. Step 1 revealed 5 main themes: (1) lack of knowledge about CRC and CRCS practices; (2) patient's fear of the CRC test

results; (3) low risk perception of CRC; (4) lack of provider CRCS recommendation; and (5) the importance of social support. Interviews revealed that the majority of clinics offer FOBT as part of their CRCS protocol; where 74.0% of these had a clinical laboratory on-site. Over half (53.0%) had implemented electronic medical records and 82.0% had health educators on staff. A logic model was developed by combining personal behaviors with behavioral determinants and identifying beliefs targeted by the intervention (step 2). Tailored interactive multimedia intervention (TIMI) and small media were selected as the practical application to deliver the intervention (step 3). Development of the program included 5 components: script development; testimonials; animations; written materials; and newsletter. Pre-testing was conducted to evaluate the usability of the program. Our educational program, SPLV, is completed and currently being implemented, using a randomized trial. Trial is being conducted in 10 FQHCs and will recruit 710 participants aged 50 to 75 who have no prior history of CRC and are not adherent to CRCS guidelines. Clinics are randomized to either the intervention group (TIMI) or the control group (usual care). We aim that this intervention will significantly increase CRCS rates and provide evidence to disseminate this educational effort to FQHCs in PR.

B010 Avanzando juntas: Adapting an evidence-based weight loss program for Hispanic breast and gynecologic cancer survivors. [AnaKaren Manriquez Prado, BA¹](#), Stacy Young, PhD¹, Sailaja Kamaraju, MD¹, Magdalisse Henderson, MS¹, Patricia Sheean, PhD², Melinda Stolley, PhD¹. ¹Medical College of Wisconsin, Milwaukee, WI, United States, ²Loyola University Chicago, Chicago, IL, United States.

Background: Obesity increases risk for recurrence for many cancers. Hispanic breast and gynecological cancer survivors (BGCS) are more likely than Non-Hispanic White BGCS to have overweight/obesity. Weight management is challenging for many Hispanics due to a complex interaction of environmental, societal and policy-related factors. These factors also contribute to disparities in cancer recurrence risk, quality of life and comorbidities. This study informed the adaptation of the evidence-based Moving Forward weight loss intervention for Hispanic BGCS. Methods: Intervention adaptation was done in an iterative process with continuous engagement of BGCS and a community advisory committee. Hispanic BGCS with BMIs < 25 kg/m² who had completed treatment at least 3 months prior were invited to participate in two focus groups offered in Spanish or English. Focus group I informed initial adaptations asking general questions about lifestyle support, interests

and needs, family and community attitudes about weight and breast cancer. Focus group II was structured with participants reviewing intervention topics and materials to inform program refinement. All groups were audio-recorded and transcribed. Multi-faceted content analysis used a combination of inductive and deductive approaches, leading to codes which were then compiled into overarching themes. Results: 30 HBGCS participated in the first round of data collection. We conducted 4 focus groups (3 English, 1 Spanish) with 14 survivors. The other 18 HBGCS completed individual interviews, an approach found to be more accessible to these predominately Spanish-speaking women. For Focus Group II, 24 of the same 30 women participated. The majority completed a focus group and 8 completed interviews. Content analysis revealed 3 major themes related to survivorship, needs and wants in the intervention: Relationships and Support, Wellness, and Advocacy and Empowerment. A cross-cutting theme underlying all topics was acculturation. Focus Group II provided additional details including particular foods and cooking methods, beliefs and values, holidays, community assets and needs, and family roles and responsibilities. These data informed intervention adaptations. Conclusions: Level of acculturation was a defining factor for participants' relationship and support dynamics, access to wellness resources, and self-advocacy versus relying on others to advocate for them. Next steps are to pilot the adapted program, Avanzando Juntas. Outcomes will include weight, metabolic syndrome risk factors and cancer recurrence biomarkers.

B011 Empowering Latinas to obtain breast cancer screenings: Comparing interventions' behavioral and network effects. [Yamilé Molina¹](#), Liliana G. San Miguel¹, Catherine Pichardo¹, Genesis Rios¹, Juanita Arroyo², Maria Medina², Nora Coronado³, Araceli Lucio², Olivia Hernandez³. ¹University of Illinois at Chicago, Chicago, USA, ²ELLAS/The Resurrection Project, Chicago, USA, ³Centro Comunitario Juan Diego, Chicago, USA.

Purpose: Multiple approaches have been used to address Latinas' disproportionate breast cancer burden, including educational interventions and empowerment related interventions, wherein a subset of the population is trained to share information with other members of the priority population. However, little work has compared their effects. Objective: To analyze data regarding the effectiveness of education and empowerment approaches on participant behaviors and network dissemination. Methods: This quasi-experimental trial was conducted in two lower-income Latino communities in Chicago between 2017-2019. Eligibility

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criteria include: 1) age of 52-74; 2) no mammography use within past 2 years; 3) no previous breast cancer diagnosis; and, 4) no prior health volunteerism experience. Women were assigned to a cohort and participate in a three-week intervention (education: breast cancer, diet, physical activity; empowerment: breast cancer, sharing information with networks, health volunteerism). For women who wished to obtain mammography (from either arm), the study team provided navigation to free/low-cost services. Data were collected at baseline, post-intervention, and six-month follow-up included standard demographics; self-reported mammography use, which were verified by study navigation records; and a modified version of Burt's General Social Survey tool for egocentric data collection. All analyses accounted for cohort clustering and adjusted for relevant covariates (age, education, income, insurance status, baseline mammography intention, social network size, baseline proportion of network engaged about breast cancer). Results: There was a total of 145 women who enrolled in the study, of which 126 completed the intervention (64 empowerment, 62 education). Approximately 70% of participants were 52-64 years old, 57% were insured, 58% had less than a 9th grade education, had an annual household income of <\$15,000 (44%), and 83% were born in Mexico. More empowerment participants had greater odds of obtaining a mammogram relative to education participants, 47% vs 84%; OR = 6.1, 95%CI [2.3, 15.5], $p < .0001$. Simultaneously, relative to education participants, empowerment participants talked to more women about breast cancer ($M = 5.4$ $SD = 4.7$ vs $M = 2.6$, $SD = 2.6$; $Std B = 2.7$, 95%CI [1.3, 4.0], $p < .0001$) as well as had greater odds of endorsing a specific type of breast cancer screening (69% vs 39%, OR = 3.6, 95%CI [1.7, 7.4], $p = .001$) and disseminating breast cancer information in public locations (48% vs 23%, OR = 3.2, 95%CI [1.6, 6.7], $p = .002$). Discussion: Empowerment approaches appear to be more effective at promoting mammography among non-adherent Latinas and enabling community-wide dissemination of evidence-based breast health information, when compared to education approaches. Limitations concern generalizability due a non-probability based sample, and limited ability for causal inferences due to a lack of randomization.

B012 Framing *Sức Khỏe là Hạnh Phúc* within the cultural adaptation process model: Adapting a cervical and breast cancer screening intervention for Vietnamese American women. Frances M Nguyen¹, Maria E Fernandez-Esquer¹, Yen-Chi Le¹, Shane Chen², Vanessa R Schick¹. ¹The University of Texas Health Science Center at Houston, Houston, TX, USA, ²HOPE Clinic, Houston, TX, USA.

Background: Cultural adaptation is the process of adapting an intervention to meet the cultural needs (beliefs, values, practices) within the social and research context of a population. Vietnamese women in the U.S. have lower rates of adherence to Pap test and mammogram guidelines than any other racial or ethnic group, which may contribute to greater risk of cervical and breast cancer mortality. Adapting interventions to the cultural needs of this population may be key to increasing screening uptake. Methods: *A Su Salud*, a theory- and evidence-based cancer screening promotion program for Mexican Americans women was adapted for use among Vietnamese American women due to similar cultural values between both groups including personal modesty and *familismo*. The Cultural Adaptation Process (CAP) model, commonly used in psychology, consists of three distinct phases for cultural adaptation: 1) community collaboration and needs assessment, 2) initial program adaptation and testing, and 3) finalizing program iterations. This poster describes the process of culturally adapting *A Su Salud* to target Vietnamese American women, retrospectively applying the Cultural Adaptation Process (CAP) model. Results: Community collaboration and needs assessment were sought through a partnership with a community-based federally qualified health center which specialized in Asian American care and four focus groups with Vietnamese American women who worked at nail salons. Feedback on intervention components was also given by members of the research team, consisting of lay health workers, students, volunteers and researchers of Mexican and Vietnamese descent. Initial program adaptation to intervention materials such as the navigation guide, brochures, and the interviewer manuals, were guided by cultural adaptation practices used in *A Su Salud*, as well as through consultation with community partners and a needs assessment survey. The initial testing of resulting materials was then completed by research staff. Materials were amended as needed throughout the research process. The resulting intervention, *Sức Khỏe là Hạnh Phúc* (Vietnamese for "Health Is Happiness") is a culturally adapted breast and cervical cancer prevention program that targeted Vietnamese American women who worked in nail salons in the Houston, Texas. Cultural beliefs and barriers identified as salient in the focus group discussions, such as modesty, unfamiliarity with the health care system, and desire for a Vietnamese provider, were incorporated into program materials, educational outreach, and navigation services. Conclusions: The CAP model is an appropriate framework for understanding the process of culturally adapting evidence-based interventions. Though CAP was not initially used in the adaptation process, it provides a framework to transfer valuable lessons learned in adapting cancer screening programs across seemingly different cultural populations.

B013, PR11 Development of a prostate cancer care and survivorship intervention trial for ethnically diverse Black men.

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Introduction: Research on the physical, psychosocial, and economic effects and coping mechanisms used by Black men from the time of prostate cancer (CaP) diagnosis to survivorship is limited. The result of the limited research on CaP care and survivorship (CaPCaS) is lack of tailored behavioral intervention programs focused on assisting Black men through the CaPCaS process. Using the principles of community engagement research, we: (1) Employed a Grounded Theory study design to develop a CaPCaS model for Black men; and (2) Developed and tested the efficacy of CaPCaS video documentary designed to assist newly diagnosed Black men in coping with their diagnosis and transitioning effectively through the CaPCaS process. Methodology: Black CaP survivors were identified through the Florida Cancer Data System. For aim 1, semi-structured interviews were conducted to collect data from participants using audio, video, and Photovoice recordings on participants' experiences on CaP prevention, detection, diagnosis, treatment, survivorship and advocacy. Using an iterative process, we developed the CaPCaS model for Black men. For aim 2, we developed the CaPCaS video documentary based on the ethnographical data collected from aim 1. Subsequently, we tested the efficacy of the CaPCaS video documentary among Black men relative to assisting them across the CaPCaS process. Results: The study comprised 10,818 Black men diagnosed with CaP. Of the 10,818 participants, the birthplaces of 4,117 Black men were identified, which allowed us to classify them into three ethnic groups: US-Born (63.5%), African-Born (0.9%) and Caribbean-born (35.6%). We found significant differences among these men relative to smoking status, age at CaP diagnosis, and first-course therapy for CaP. To develop the CaPCaS model, we reached data saturation with 32 participants for the Grounded Theory study. The CaPCaS model that was developed represented the trajectory of CaP prevention, screening, diagnosis, treatment, survivorship, and advocacy. An unexpected unique theme that emerged is the Point of Prostate Cancer Diagnosis (PPCD) Model. The PPCD interpretative framework provides information that can be used by physicians to prepare for their PPCD consultation with Black men as well as develop a support system for Black men at the PPCD. We also developed CaPCaS video documentary for each of the CaP care

continuum phases (see: https://www.dropbox.com/sh/c4g49x47n9jx2fp/AACHF8vnI_5H6MB00U3mN9rla?dl=0). The videos were tested among 17 Black men. Satisfaction and quality were rated high for all 6 videos. In addition, there was improvement in the attitude, beliefs, perceived behavioral control and knowledge of participants after the CaPCaS videos intervention. Conclusion: Through the Florida CaPCaS project, we have developed 6 video interventions based on the CaP experiences of ethnically-diverse Black men. The videos provide Black men the ability to connect with and learn from survivors who have gone through CaP diagnosis.

B014 Disseminating prostate cancer scientific discoveries into public health and community applications: The Minority Prostate Cancer (MiCaP) Research Digest.

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Introduction: A key strategy to address the disproportionate burden of prostate cancer (CaP) seen in Black men (BM) is increased access to life-changing, scientific CaP discoveries, especially those with implications for primary and secondary preventive interventions as well as information that will enhance access to CaP clinical trials. In line with this approach, our primary objective was to develop a research dissemination program, the Minority Prostate Cancer (MiCaP) Research Digest, which will spread information about CaP scientific discoveries, evidence-based interventions, and open clinical trials instantly among BM. We hypothesized that knowledge, perceived behavioral control, cues to action, and risk-reduction and prevention behaviors will be higher among the users of the MiCaP Research Digest compared to nonusers. Methodology: A mixed-method design was used to implement the study in three phases: (1) planning and strategy selection; (2) development and pretest of materials; and (3) implementation. The study population was BM between the ages of 35 and 70 years in Florida. Guided by valid behavioral and health communication models and based on an understanding of the scientific information needs of BM (obtained through focus groups and literature review), we developed the MiCaP Research Digest. It was pretested among BM to assess their reaction to the channel and materials for quality improvement. Following the pretest, we are currently using a randomized waitlist research design to test our hypothesis. Results: A Communication Strategy Statement was developed from the focus group sessions and in-depth interviews and used to compose the Research

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Digest framework, including: scientific and advocate anchor; communication product (e-publication, video, weblog, and community forum clips); content; approach; and distribution. Thirty-three participants participated in the Digest pretest (see <http://www.kaltura.com/tiny/lzi3i>). Majority of the participants were US-born BM (78.13%), married (76.67%), have college degree (33.33%), and between 50 and 59 years (36.67%). About 60% had been screened for CaP within the last year. However, less than 50% of the participants had read or heard about current CaP research or scientific discoveries within the last year. Based on t-test procedure, we found statistically significant improvement after the MiCaP Research Digest intervention on interest in participating in clinical trials, perceived behavioral control, and knowledge of scientific discovery. Also, the MiCaP Research Digest was positively evaluated by most of the participants. Conclusion: We established the fidelity of the MiCaP Research Digest and currently conducting an intervention trial to establish the effectiveness of 6 volumes of the Digest. Twenty-two BM have been recruited so far and results of the intervention phase will be presented at the conference. The MiCaP Research Digest will assist BM to make informed decisions based on the latest CaP scientific discoveries.

B015 Community and research perspectives regarding cancer disparities: A comparative analysis of listening sessions with diverse stakeholders. Jessica Olson¹, Tobi Cawthra¹, Kirsten Beyer¹, David Frazer², Lyle Ignace³, Cheryl Maurana⁴, Sandra Millon-Underwood⁵, Laura Pineseault⁶, Jose Salazar⁷, Alonzo Walker¹, Carol Williams¹, Melinda Stolley¹. ¹Medical College of Wisconsin, Milwaukee, WI, USA, ²University of Wisconsin-Madison, Madison, WI, USA, ³Gerald L. Ignace Indian Health Center, Milwaukee, WI, USA, ⁴Advancing a Healthier Wisconsin Endowment, Milwaukee, WI, USA, ⁵University of Wisconsin-Milwaukee, Milwaukee, WI, USA, ⁶Spark Policy Institute, Denver, CO, USA, ⁷Sixteenth Street Community Center, Milwaukee, WI, USA.

Background: Wisconsin's cancer disparities affect both urban minority and rural communities. A team of academic researchers and community stakeholders convened to understand the complexity of these disparities by analyzing relevant data and community and academic perspectives. Through this analysis, the team identified opportunities for multi-sector collaboration and develop an integrated and collaborative action plan. Methods: Listening sessions and interviews were conducted with more than 200 individuals representing diverse "cells to community" backgrounds. Sessions included a brief review of maps illustrating the

breast and lung cancer burden across Wisconsin, and a semi-structured set of questions regarding causes, solutions, and opportunities. A leader with cancer disparities knowledge, public health expertise, and qualitative data collection experience facilitated listening sessions. Whenever possible, facilitators were representative of the cultural and racial/ethnic identities or research backgrounds of the majority of participants. ATLAS.ti was used to codify themes from field notes by two independent coders. Rules for summarizing data, coding, and organizing results were discussed iteratively, and a third qualitative researcher resolved discrepancies. Emerging themes strongly aligned with The Model for Analysis of Population Health and Health Disparities by the National Institutes of Health, and thus, themes were integrated into this framework. Results: Coding themes using The Model for Analysis of Population Health and Health Disparities highlighted areas for potential collaboration as well as specific gaps in knowledge or awareness between researchers and community stakeholders. Communities had unique insights regarding the physical context of cancer disparities including environmental and social factors. Researchers, on the other hand, reflected specialized expertise on biologic and genetic pathways and biological responses such as genetic predisposition and the influence of reproductive and gynecologic factors. Participants from all sectors recognized the need to address individual behavioral risks, patient support, and the need for multi-level partnerships. Conclusions: The Model for Analysis of Population Health and Health Disparities is an effective tool for understanding results from broad based, transdisciplinary perspectives. Using this framework to analyze listening sessions reveal that stakeholders in both community and research settings had unique expertise and perspectives that enhanced the team's collective understanding of cancer disparities in Wisconsin.

B017 Rural interventions for screening effectiveness: Baseline cancer screening behaviors of rural women of Indiana and Ohio. Electra D Paskett¹, Ryan D Baltic¹, Mira L Katz¹, Gregory S Young¹, Susan Rawl², Victoria Champion². ¹The Ohio State University, Columbus, OH, US, ²Indiana University, Indianapolis, IN, US.

Rural areas of the United States experience increased cancer incidence and mortality rates and lower cancer screening rates compared to urban areas. According to the National Center for Health Statistics, Ohio and Indiana are ranked 8th and 10th highest, respectively, for cancer mortality rates nationally. The Rural Interventions for Screening Effectiveness (RISE) Study conducted by The Ohio State University and

Indiana University focuses on improving breast, cervical and colorectal cancer screening rates in rural areas of both states to reduce this cancer burden. RISE is testing two interventions to educate and encourage women in rural counties of Ohio and Indiana ages 50-74 years to complete any needed screenings. Participants complete baseline and 12-month surveys and receive usual care brochures, an interactive DVD, or the DVD along with phone-based assistance from a patient navigator. In order to be eligible to participate, women must be residents of a rural county of either state, outside of guidelines for breast, cervical, and/or colorectal cancer screening per medical record review, and have no personal history of inflammatory bowel disease, cancer (except non-melanoma skin cancer), or genetic conditions that increase cancer risk. Baseline demographic and cancer screening history data were collected from 1634 women (1041 Ohio, 593 Indiana), and 985 were ultimately eligible and enrolled in the study (599 Ohio, 386 Indiana). Women who were within guidelines for all three screening tests were excluded from the study; 442 (42.5%) in Ohio and 207 (34.9%) in Indiana. A larger proportion of Indiana women were outside of guidelines for all three screening tests (80 of 593 (13.5%)) compared to Ohio women (107 of 1041 (10.3%)). Across both states, more women were adherent to breast cancer screening guidelines (75.3%) than cervical (66%) or colorectal cancer screening guidelines (58.8%). A comparison of screening behaviors of Indiana and Ohio participants will be conducted to determine if differences between the two exist. Analyses will focus on being inside or outside of guidelines by individual test (breast, cervical, and colorectal) and all three tests combined. Although rural women of Midwest states are often considered to be very similar, differences in screening behaviors exist, even between women of neighboring states, and future efforts to improve the cancer burden in rural women could benefit from considering factors that contribute to these differences, such as access to quality care.

B018 A tribal-academic multi-theory-driven messaging intervention to increase mammography participation is well-received by community women. Ann Nicometo¹, Robert A. Vierkant², [Wesley O. Petersen](#)². ¹Empowering Communities, Rochester, MN, USA, ²Mayo Clinic, Rochester, MN, USA.

Purpose: : “No Squeeze Can Defeat Me: Mammograms for Life!” (locally, “My Life Matters: Mammograms for Life!”) was funded 2016-2019 by the Minnesota State Department of Health. It implemented a low-cost, low-tech intervention that used theory-based messaging to increase tribal women’s participation in annual mammograms and their adherence

to local screening guidelines. Messaging was grounded in elements of theoretical models of health behavior that our previous research showed significantly differentiated adherent women from non-adherent women. Procedures: An 8-member tribal Community Advisory Project Board, including a 3-person Project Implementation Team, guided and carried out the intervention. The team developed and distributed 48 unique posters and placed 4-5 new posters every 6-8 weeks in 82 locations across four reservation communities. A convenience sample of women evaluated the posters. Posters had varied messages that were shaped by at least one influential element and theoretical model (e.g., Perceived Benefit from the Health Beliefs Model). 84% of displayed posters contained images of adherent tribal women. Pairwise associations of survey variables were examined using Fisher’s exact tests. Results: 229 women evaluated posters (32% under the age of 40, 64% between 40-70 years, 4% older than 70). Approximately 80% of women age 40 and older reported having at least one mammogram in their lifetime. 71% of all women said they learned something new. 96% of women said messages were personally important and 99% thought them important for other women. Of women finding the messages personally important, 99% were greater than age 40 compared to 90% who were less than age 40 ($p=0.002$). In those reporting they learned something new, 98% were greater than age 40 compared to 91% who were less than 40 ($p=0.05$). 97% of women said they would continue reading the messages when new ones were posted, underscoring the interest raised by the intervention. 164 women reported recognizing women featured on a poster. Of these, 77% said that recognition made the poster more interesting; only 2 said it made the poster less interesting. When asked if they would be more or less willing to get a mammogram if they knew others got one every year, 63% of women said they would get one regardless, 34% would be more willing, less than 1% would be less willing, and 3% said they would not get a mammogram regardless. Conclusions: Overall, women very positively regarded the posters. The sample was diverse by age, with almost one-third not yet age-eligible for screening. Across all ages and screening histories, a great majority of women agreed: 1) the posters were personally important and important for others; 2) were interested in seeing additional posters; and 3) appreciated seeing photos of adherent women on them. With 34% of viewers being more inclined to get mammograms upon knowing of others who had them, increases in monthly mammograms may be expected.

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B019 Estimating the costs and cost-effectiveness of promoting mammography screening among US-based Latinas.

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Purpose: We characterize the costs and cost-effectiveness of a community health worker (CHW)-based intervention to promote screening mammography among US-based non-adherent Latinas. **Methods:** The parent study was a randomized controlled trial for 536 Latinas aged 42-74 years old who had sought care within a safety net health center in Western Washington. Participants were block-randomized within clinic to the control arm (usual care) or intervention arm (CHW-led motivational interviewing intervention). We used the perspective of the organization implementing promotional activities to characterize costs and cost-effectiveness. Cost data were categorized as program set-up and maintenance (initial training, booster/annual training) program implementation (administrative activities, intervention delivery); and, overhead/miscellaneous expenses. Cost-effectiveness was calculated as the incremental cost of screening for each additional woman screened between the intervention and control arms. **Results:** The respective costs per participant for standard care and the intervention arm were \$69.96 and \$300.99. Most costs pertained to program implementation and administrative activities specifically. The incremental cost per additional woman screened was \$2,595.32. **Conclusions:** Our findings are within the ranges of costs and cost-effectiveness for other CHW programs to promote screening mammography among underserved populations. Our strong study design and focus on non-adherent women provides important strengths to this body of work, especially given implementation and dissemination science efforts regarding CHW-based health promotion for health disparity populations.

B020 Development of a tailored interactive multimedia intervention (TIMI) to promote colorectal cancer screening among Puerto Ricans.

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USA, ²UT Health Science Center at Houston, Houston, TX, USA, ³University of Puerto Rico - Medical Science Campus, San Juan, PR, USA, ⁴University of Puerto Rico - Medical Science Campus; Comprehensive Cancer Center, San Juan, PR, USA.

Colorectal Cancer (CRC) is the second highest incident cancer among men and women in Puerto Rico (PR) however, CRC screening (CRCS) rates remain low. Data from the 2016 Behavioral Risk Factor Surveillance System indicated that only 18.0% of the PR population aged 50 to 75 had undergone a Fecal Occult Blood Test (FOBT) within the past year compared to 8.0% in the United States (US). Additionally, 50.1% of age-eligible Puerto Ricans reported having a colonoscopy in the past 10 years compared to 63.5% in the US. At a national level, the National Colorectal Cancer Round Table established as a goal to reach CRCS rates of 80% by 2018. Improving educational and interventional strategies to promote behavioral changes and screening uptake can help increase CRCS rates in PR. The Community Preventive Services Task Force (the community guide) recommends the adoption of interventions that use small media, based on strong evidence of their effectiveness in increasing colorectal cancer screening by FOBT; yet there is no sufficient evidence for sigmoidoscopy or colonoscopy. Using Intervention Mapping (IM), the Puerto Rico Community Cancer Control Outreach Program of the UPR/MDACC Partnership for Excellence in Cancer Research developed a self-directed tailored interactive multimedia intervention (TIMI) aimed to increase CRCS in Puerto Ricans. To develop a TIMI for the educational program ¡Salud!, Por la Vida, which aims to increase CRCS among non-adherent men and women aged 50 to 75 in FQHCs in PR. We developed a series of tailored CRCS messages that were both culturally and linguistically appropriate. First, the conceptual model and flowchart of the TIMI was developed. The conceptual model included subject matter, length, and user interface. Then, we created the script and storyboard to produce a prototype that was tested within the Community Advisory Group and community members to obtain feedback on cultural relevance and linguistics. The script was adapted according to recommendations and fictional content including acted scenes, testimonials, and animations were produced. The TIMI was Beta tested for sequence, interface, and graphics. During the Beta test, the application was scrutinized for errors or missing elements. The final TIMI is delivered using tablets and consists of brief interactive videos that are tailored by variables considered relevant for CRCS (e.g. perceived risk and family history among others). This innovative and technologic educational intervention, which was developed from a guiding framework, will help increase CRCS among

non-adherent to CRCS men and women aged 50 to 75 visiting FQHCs in Puerto Rico. We are currently conducting a randomized behavioral intervention trial in 10 FQHC clinics in PR to test the efficacy of this program on CRCS completion.

B021 The Impact of a community-based breast and cervical cancer education intervention among New Mexico Hispanic/Latina women.

Elba L Saavedra Ferrer, Belinda Vicuña Tellez, Monica Fiorella Asencio Pimentel, Yesenia Hernandez, Florencia Aldaz, Luz Elena Bustillos, Bertha Campos, Blanca Cardenas, Patricia Corona, Cathy Landavazo, Rosa Lopez. University of New Mexico, Albuquerque, NM, USA.

Introduction: The Comadre a Comadre Program is an ecological-based, community-engaged, culturally-centered and peer-led approach to breast cancer education, support and navigation. A primary aim is to increase education and awareness of screening, early detection, diagnosis, and treatment of breast and cervical cancer to equip Hispanic/Latina women to make informed decisions. The Breast Health Platica (BHP) Project partners with local community stakeholders to deliver breast and cervical cancer education utilizing peer-educator survivors along with a dynamic curriculum. Methods: From fall 2016 to spring 2019, 99 BHP classes were held in Spanish (79.8%), English (17.2%), and bilingual English/Spanish (3.3%), with 1,151 Hispanic/Latina women in attendance. Class participants completed assessments on breast/cervical cancer knowledge, attitudes, and beliefs prior to and immediately after the BHP class. Participants also completed a class evaluation survey. For each class, most salient myths about breast/cervical cancer and barriers to getting breast/cervical cancer screening were documented. Findings: The most salient myths concerning breast cancer were: fatalistic beliefs (59.6%), beliefs that getting screening leads to a cancer diagnosis (40.4%), and that trauma to the breast causes cancer (29.3%). The most salient barriers to getting breast/cervical cancer screening were: not having medical insurance (44.4%), the cultural value of modesty (*verguenza*) (41.4%), and concerns about immigration status (17.2%). In pre- and post- test comparisons, there was a statistically significant increase in the proportion of women who strongly agreed with speaking to their doctor/provider about their personal cancer risk [$X^2(1, N = 1,151) = 26.33, p < .001$] and about cancer screening tests [$X^2(1, N = 1,151) = 23.08, p < 0.001$]. Women also reported greater intentions to seeking breast [$X^2(1, N = 1,151) = 30.84, p < 0.001$] and cervical [$X^2(1, N = 1,151) = 39.63, p < 0.001$] cancer screening tests in the future. Overall, 58.2% of women in attendance felt more prepared to make informed decisions about breast/cervical cancer screening, 58.6% believed the class had a positive

impact, and 62.4% reported that the class was a valuable experience. Finally, qualitative analyses also revealed that women greatly benefitted from becoming more informed on the early detection of breast/cervical cancer, expressing a desire to share the information with others. Conclusion: Hispanic/Latina continue to experience disparities in breast and cervical cancer screening, in knowledge on early detection and in access to cancer screening services. Improving breast/cervical cancer outcomes for undeserved Hispanic/Latino populations requires community-engaged, integrated approaches to breast and cervical cancer education and navigation.

B022 Increasing breast cancer knowledge in Puerto Rico through partnerships.

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Introduction: In 2015, according to the Puerto Rico Central Cancer registry (PRCCR), 2,188 women were diagnosed with invasive breast cancer and 432 women died from this disease. The BRFS by 2016, reported there still are 20% (1 in 5) of women in Puerto Rico aged ≥ 40 year who are not in compliance with current breast cancer screening guidelines. For that reason, is necessary to continue effective education efforts to increase breast cancer screening in the women population. For this purpose, the Puerto Rico Breast and Cervical Cancer Early Detection Program (PRBCCEDP) in collaboration with Cooperative Extension Services (CES) developed a pilot project to evaluate a breast cancer flipchart to know if this tool could help to increase the knowledge on breast cancer. Method: The PRBCCEDP established collaboration with the Cooperative Extension Services (CES) to develop and implement a group educational intervention using a Breast Cancer Flipchart to address breast cancer burden, risk factors, and other information. This pilot project included the participation of 10 Family and Consumer Educators (FCE's) in the north area of Puerto Rico. A total of 148 women participated in 11 educational activities and 114 completed a pre- and post-test and an evaluation of the activity. Descriptive and quantitative data analysis were made using SPSS (version 23). Results: The pilot project results are the following: the participants were mostly women (96.3%) with an average age of 53 years and 43% had completed high-school. Forty-two percent of participants were covered

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by the Government Health Plan, and only 68% have had a mammogram in the last two years. The majority of the participants (90%) rated as good the time assigned to the activity, the content of the educational activity, and the language level used on the flipchart. Moreover, 85% of the participants rated as good the visuals used and the flipchart. In addition., the 90% of the participants totally agreed that the activity: Increased their knowledge of breast cancer, risk factors and recommended screening guidelines, motivated them to visit the doctor to talk about mammography and breast cancer, and to talk with their family and friends about of breast cancer. There was a significant increase in knowledge ($p < 0.05$) in the post test in five of the six questions compared to the pre-test. Conclusion: This project demonstrates the effectiveness of a group educational intervention, utilizing a flipchart, to increase breast cancer knowledge among the Puerto Rican women. This tool could be helpful for FCE's conducting educational activities in settings without technological resources. These efforts helped to include the breast cancer flipchart educational activity in an educational module entitled Promoting Healthy Lifestyles. In 2019, CES successfully implemented this educational intervention in the northern and southern regions of the island with the participation of 30 FCE's.

B023 Cancer disparities and faith-based messaging in the African American church. Tiffany H Williams. Independent Advocate, North Charleston, SC, USA.

Cancer disparities and faith-based messaging in the African American church.

B024 Impact of a Spanish peer support group for women with breast and ovarian cancer. Olympia Cepeda, Stephanie Blaufarb, Bremda S. Acosta, Monica Escobar, Maria T. Estrella, Jennie Santiago, Ivis Sampayo. SHARE Cancer Support, New York, NY, USA.

Introduction: Cancer is the most frequent cause of death for Latinos in the United States (American Cancer Society, 2018). Language barriers prevent Spanish-speaking patients from fully understanding their diagnosis and from becoming involved in patient centered decision making (Moore, R.J., et al., 2004). 30-45% of women with breast cancer experience substantial psycho-social morbidity in the first two years of survivorship (Burgess C., et al., 2005). LatinaSHARE support groups seek to address these issues by providing emotional support and information about members' cancer diagnosis in Spanish. Methodology: We conducted an anonymous, in-person and telephone survey in a 30-day period to determine

how, if in any way, our Spanish language peer support groups have impacted its members and to identify strengths and areas for improvement in these support groups. Out of 250 current support group members, we collected 89 responses (36%). 52 responses were collected in-person in support groups and 37 responses were collected over the phone. The survey instrument included 19 questions: 4 open-ended qualitative questions, 13 multiple choice questions, and two Likert scale questions. The questions focused on whether women were emotionally supported, acquired more information about their diagnosis, and are more comfortable advocating for themselves with their doctors. Results: 100% of respondents reported that attending the support group helped them generally. 89% reported they were helped by receiving support. 76% of respondents reported they were helped by receiving information. 100% of respondents felt more confident when talking about cancer with their doctors or their friends. 87% of respondents felt more confident when talking about their cancer with their family. In the qualitative analysis, some themes emerged around what was most beneficial to group members, including: information and education, emotional support, peer guidance, community, fellowship, and sharing with others. When support group attendees were asked what they found least beneficial, one important theme emerged, that the once a month groups should meet more often. Conclusions: The results demonstrate the importance and effectiveness of Spanish language peer support groups for breast and ovarian cancer survivors. These groups provide support, information and prepare members to better communicate with their doctors, friends and family about their diagnosis. It is unclear why some respondents did not feel more confident speaking about their diagnosis with their spouse/partner (33%). However, some respondents may not have a spouse or partner so this question should be included in future research. To address the qualitative theme that groups would like to meet more often, programs staff will investigate the feasibility of adding more frequent meetings. Some limitations include small sample size and a lack of validity testing of the instrument.

B025 "Kulu the Colon": An assessment of a colorectal cancer education intervention in Guam. Tressa P. Diaz, Maurissa Sayama, Lilnabeth Somera, Angelina Mummert. University of Guam, Mangilao, Guam, USA.

Background. The island of Guam is a U.S. territory where a large proportion of Pacific Islanders and Filipinos reside. CHamoru, the indigenous people of Guam, have the overall highest incidence and mortality rates in colorectal cancer

(CRC). CRC is the third leading cause of cancer death for both men and women on island. CRC screening data indicate 44.2% of persons age 50 and above have met USPSTF screening standards for CRC compared to 67.3% of the same cohort in the U.S. (CDC, 2019). In addition, CRC diagnoses often occur in the late stages with recent data revealing that 75.0% of these occur at Stage 3, while 18.0% occur at Stage 1 (Pacific Regional Central Cancer Registry, 2018). These late stage diagnoses have implications for early detection and CRC screening education interventions. The aim of this study was to provide CRC education via a giant inflatable colon and to assess changes in CRC knowledge, intent to screen for CRC, and willingness to discuss CRC with others. Methods. A pre- and post-test study design was used to assess changes in knowledge, beliefs, likelihood of discussing CRC screening with family members, and intent to screen after a guided tour through a giant inflatable colon. Participant response to whether the inflatable colon was a culturally appropriate education tool was also evaluated. We recruited participants at a health fair in a mall and an island-wide university event, through flyers, and convenience sampling. At the launch of the inflatable colon, we held a name-the-colon contest to engage community. The winning entry was “Kulu,” which is the CHamoru word for a conch shell and symbolizes a “call to action” to get screened for CRC. Results. A total of 201 participants completed a pre/post assessment. Majority of participants were CHamoru (40.8%) and Filipino (33.8%), female (65.0%), had a college degree (31.8%), and had health insurance (89.6%). Mean age was 36.6. Preliminary results at baseline indicate half of participants reported knowing what CRC (53.0%) and a polyp (50.5%) are. Overall, 72.4% reported knowing what a colonoscopy is and 42.4% indicated they knew what a stool test was. Prior to participating in the guided tour, 73.5% rated their general knowledge about CRC as neutral or unknowledgeable. At baseline, participants reported intent to discuss CRC screening with others (parents = 84.0%; spouses/partners = 90.3%). Conclusion. We hypothesize that using an inflatable colon to deliver CRC information: 1) increases CRC and related screening knowledge; 2) is a culturally appropriate way to provide CRC education; and 3) facilitates increased willingness to talk to others about CRC, especially among families. Pre-/post-test comparisons regarding CRC knowledge, willingness to talk to others about CRC, and intention to screen among persons 50 and above will be presented. Findings may provide insight toward more interactive CRC education for Pacific Islanders, and potentially improve CRC screening participation in Guam.

B026 Occurrence of comorbidities among diverse hospice cancer patients with and without diabetes. [Lisa Scarton](#), Yingwei Yao, Diana J Wilkie. University of Florida, Gainesville, Florida, United States.

Introduction: More than 100 million Americans have diabetes or pre-diabetes and 1.7 million new cancer diagnoses are expected in 2019. A strong link exists between type 2 diabetes (T2D) and several forms of cancer including liver, pancreatic, and colorectal cancers. Additionally, the prevalence of comorbidities such as hypertension, cardiovascular disease, and depression among patients with cancer is common and can affect prognosis, treatment outcomes, and survival rates of patients. However, little is known about how comorbidities differ among cancer patients with and without diabetes across racial and ethnic groups. Therefore, we compared comorbidities, among adult hospice cancer patients with and without diabetes. Methodology: Of 233 adults with cancer, 51 (mean age 69.9±11.9) reported they also had diabetes and 182 (mean age 67.9±14.6) did not report diabetes. Both groups were 51% male and 55% racial/ethnic minorities (35% Black, 20% Hispanic among those with diabetes; 34% Black, 19% Hispanic among those without diabetes). Results: The number of comorbidities differed significantly between groups; patients with diabetes experienced twice as many (excluding diabetes) comorbidities (4.0±3.2 vs 1.8±1.9, p<0.001). Black patients (n=79) had more comorbidities than non-Hispanic Whites (n=104) (3.1±3.0 vs 1.8±2.0, p=.001). The disparity was especially severe for Blacks with cancer and diabetes (n=18): not counting diabetes, they had on average 5.8±3.5 comorbidities compared to 3.2±2.9 for non-Hispanic Whites with diabetes (p=.01). The difference between non-Hispanic Whites (n=104) and Hispanics (n=44) on comorbidities, however, was not statistically significant (1.8±2.0 vs 2.2±1.6, p=.19). Conclusions: Findings revealed significant differences in the number of comorbidities between patients with and without diabetes. Patients with cancer and diabetes experienced twice as many comorbidities than those without diabetes while Black patients with cancer and diabetes experienced nearly twice as many comorbidities compared to non-Hispanic Whites. The co-occurrence of chronic health conditions in patients with cancer and diabetes can have a negative impact on cancer outcomes. Patients with comorbidities are less likely to receive curative treatment for their cancer and are more likely to experience complications. More research is needed to investigate comorbidity risks in patients with cancer and diabetes across racial and ethnic groups to elicit a better understanding of the complexity of patients with multiple comorbidities in an effort to decrease disparities and improve cancer outcomes. Additional

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prospective research is needed with additional diabetes-related variables (e.g., type of diabetes, HgA1C) to better understand comorbidities among racial and ethnic cancer populations.

B027 Reducing liver cancer disparities through culturally tailored educational messages: A city-wide bus campaign in Philadelphia City.

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Background: Liver cancer increased 72 percent between 2003 and 2012 in the US. Similarly, the liver cancer death rates in the US are increasing faster than for any other cancer, having doubled since the mid-1980s. People with hepatitis B and C have the greatest risk of liver cancer. In the US, approximately 65 percent of liver cancer cases are related to hepatitis B or C (HBV or HCV), with nearly 50 percent attributable to hepatitis C alone. Objective: The Community Outreach Core (COC) Program is a part of the NCI funded TUFCCC/HC Regional Cancer Health Partnership Program and targets areas of Pennsylvania, New Jersey, and New York City. One of the most important goals of the COC is engaging community partners in cancer outreach research to reduce cancer disparities among underserved minority populations in the Partnership targeted geographic areas using Community-Based Participatory Research (CBPR) approaches. The purpose of this project is to mobilize the community to increase awareness of hepatitis B and C, and empower community members to talk to their trusted doctors about hepatitis B and C and to be tested. Method: The campaign features an educational advertisement on SEPTA buses (Southeastern Pennsylvania Transportation Authority) in Philadelphia City, PA. The promotional messages included culturally tailored educational messages targeting high risk residents with HBV or HCV related liver disease. The central message of the ad calls for action of “getting screened for HBV and HCV”. The Campaign ad poster (21”x22”) posted in 115 buses traveling in the City of Philadelphia for 4 weeks. In total, 938,280 bus riders had a chance to view the ad information. 173 survey forms were

collected from diverse racial/ethnicity bus riders both men and women during the campaign period. Results: Among the 173 respondents, 22.7% of them reported “saw advertisement on the bus.” Specifically, riders who saw the advertisement are significantly more likely to get screened for HBV/HCV than those who did not see the advertisement (86.5% vs 58.3%). Conclusion: The findings of the project suggested that culturally tailored educational messages can effectively promoting HBV/HCV screening. The next steps of community outreach strategies will also be discussed.

B028 The stages of change model approach to reducing endocrine-disrupting chemical exposures linked to breast cancer risk for Black women.

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In the US Black women (BW) are more likely to die from breast cancer (BC) than White women. Research increasingly supports the association between ingredients found in hair and personal care products and BC risk, linked to endocrine disrupting chemicals (EDCs). BW spend more money on hair products (HPs) containing EDCs than other racial groups. Some scholars posit that for many BW, hair is synonymous with identity. To further explore the complex interplay between hair, identity, and breast health we developed and validated the Black Identity, Hair Product Use, and Breast Cancer Scale (BHBS). The purpose of this study is to provide direction on the utility of the scale in capturing sociocultural factors related to BC risk and HPs use for intervention planning. Methods: The 11-item BHBS scale includes two subscales, one measuring sociocultural perspectives about hair and identity (5-items) and the other perceived breast cancer risk related to HPs (6-items). Response options strongly disagree/disagree are categorized as “low importance” and strongly agree/agree as “high importance”. Analysis includes descriptive and inferential statistics. Survey data was analyzed using SPSS Version 25. Results: Participants (N=185) were African/Caribbean and African American women ages 29 to 79. Eight percent (n=15) had been diagnosed with BC. Forty percent had a mammogram previously and 59.5% intended to have a mammogram in the future. BW (89.5%) who are concerned about BC and intend to watch the ingredients of products were more likely to intend to have a mammogram in the future (p=0.02). 46.6% of BW who are concerned about BC and intend to

watch the ingredients of the products they use, felt pressure from their female friends to straighten their hair ($p=0.04$). On the contrary, 84.6% women who plan to adjust how they use HPs because of their concern about BC: 1) did not think it necessary for BW to have their hair straight in order to be successful in business ($p=0.03$) and 2) did not think BW needed to straighten their hair in order to attract Black men ($p=0.003$). Furthermore, 92.4% of women who wanted to learn more about the health risks of HPs (88% of all), agreed that BW needed to straighten their hair to attract Black men ($p=0.03$). Overall, participants were interested in learning more about BC risk and HPs use through social media (88.1%) and from their stylist (82.2%). Discussion: In the US straight hair for BW continues to represent Eurocentric ideals of beauty and acceptance resulting in BW using HPs containing EDCs. While many of our participants intend (contemplation) to watch ingredients or learn (contemplation) more about HP related health risks, they felt pressure (friends, partners) to straighten their hair. However, those who worry (contemplation) about ingredients or plan (preparation) to adjust their HPs use, felt less need to submit to peers, or societal ideals of success and mate selection linked to straight hair. Thus, the stages of change model maybe used to develop health-related behavior interventions for our participants.

B029 Community-based colorectal cancer screening initiative to address colorectal cancer disparities among African Americans and sexual and gender minorities on the Southside of Chicago. Karriem S Watson¹, Vida Henderson², Jessica Madrigal², Jeanette Gonzalez², Erica Martinez², Nasima Mannan², Tonya Roberson³, Marcus Murray³, Katherine Tossas-Milligna², Robert A Winn². ¹Univeristy of Illinois Cancer Center, Chicago, IL, USA, ²UI Cancer Center, Chicago, USA, ³Project Brotherhood, Chicago, IL, USA.

Background Colorectal cancer (CRC) persists as the second leading cause of cancer death and African Americans (AA) carry a disproportionate burden of CRC, having the highest incidence and mortality. Although CRC is one of the few cancers where screening can be prevention, AAs have lower uptake of CRC screening. Additionally, sexual and gender minorities (LGBTQ) are another population with growing CRC disparities. To date, few initiatives address CRC among LGBTQ populations. Factors impacting screening uptake among AA and LGBTQ populations are multi-factorial including access, awareness, and stigma. To attenuate low rates of CRC screening, the University of Illinois Cancer Center through funding from the Bristol-Myer Squibb Foundation has developed the UI CAAN (Cancer Screening; Access; Awareness; Navigation) Project. UI CAAN is a

community focused cancer education, prevention, screening and navigation program aimed at addressing the elevated burden of CRC within the UI Cancer Center catchment population targeting 200 AA per year for three years. Methods Building upon the Center for Disease Control and Prevention socio-ecological model, UI CAAN will address multi-level barriers impacting CRC screening. The American Cancer Society recommends screening starting at age 45 using Fecal immunochemical tests (FITs). Community Lay navigators will work with barber shops, beauty/nail salons and venues frequented by members of the LGBTQ community to provide education and free FIT kits to AA on the Southside of Chicago. Participants who return their FIT kit will be compensated with a \$25 Certificate for the barber or beauty salon or \$25 gift card for those engaged through community venues. The project will partner with a Federally Qualified Health Center (FQHC) on the Southside of Chicago to support navigation for follow up. Results Year I is devoted to planning, priority setting and community engagement. The key community stakeholder for UI CAAN is Project Brotherhood, a non-profit community based organization with over two decades of successful engagement of AA communities. To date the project has identified a) A community health worker/lay patient navigator from the targeted community; b) identified and trained one barber and one beautician; c) identified and trained a community health psychologist to assist with program design and implementation and d) has identified two Community Health workers from the LGBTQ community in the target area. IRB approval has been obtained. Conclusion Completion of planning and priority setting of the UI CAAN Project to improve CRC screening among AA and LGBTQ populations on the Southside of Chicago demonstrate the feasibility of community engagement to plan and implement a community based CRC screening initiative. Phase II of Year I will begin August 2019 with screening and recruitment from a barber shop, beauty salon and key community events on the Southside of Chicago with navigation to a local FQHC.

B030 See, Test, and Treat: Engaging vulnerable populations in cancer screening. Michelle S Williams¹, Jimmie Wells², Roy Duhe¹, Timothy Allen¹. ¹University of Mississippi Medical Center, Jackson, MS, USA, ²St. Dominic's Hospital, Jackson, MS, USA.

Background: The breast cancer and cervical cancer mortality rates among women in Mississippi are higher than the national averages. Early detection and early treatment are associated with longer survival rates among women who are diagnosed with breast cancer or cervical cancer. However, the percentage of women in Mississippi who

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report having regular mammograms and in cervical cancer screenings is lower than the national average. Purpose: Clinicians and investigators at UMMC are actively working within transdisciplinary teams to implement evidence-based interventions aimed at reducing breast and cervical cancer mortality disparities in the state. Methods: See, Test, and Treat was a community-based cancer screening event that occurred on June 1, 2019 at the UMMC Cancer Center and Research Institute. The UMMC team provided breast, cervical and oral cancer screenings to 103 women. Healthy cooking and exercise demonstrations, were conducted to actively engage patients in health education activities. Participants completed a brief exit survey that was used to gather data on the effect of the program on the patients' knowledge and attitudes towards cancer screenings, and intentions to changed cancer related health behaviors. Results: The short-term outcomes showed that 21 patients had abnormal mammograms. All of the patients with abnormal mammograms were immediately linked to follow-up care. No Pap tests were returned with abnormal results. However, the clinicians diagnosed 8 patients with Trichomonas. The majority of the patients indicated that their knowledge of and attitudes towards breast and cervical cancer screening changed positively and the majority intended to change their cancer related health behaviors. Conclusion: See, Test, and Treat is an effective community-based activity that can increase access to breast, cervical and oral cancer screenings by uninsured and underinsured women.

B031 Florida-California CaRE2 Health Equity Center Citizen Scientist Training Program: Results from pilot program. [Nissa Askins](#)¹, [Folakemi T Odedina](#)¹, [Diana Wilkie](#)², [Mary Scroggins](#)³, [Linda Behar-Horentstein](#)², [Mariana Stern](#)⁴, [Lourdes Baez Conde](#)⁴, [R. Renee Reams](#)⁵. ¹University of Florida Research and Academic Center Lake Nona, Lake Nona, FL, USA, ²University of Florida, Gainesville, FL, USA, ³Pinkie Hugs, LLC, Washington, DC, United States, ⁴University of Southern California, Los Angeles, CA, United States, ⁵Florida A&M University, Tallahassee, FL, USA.

INTRODUCTION: Citizen Science is the engagement of lay people in the process of scientific research. From IRB membership to the formation of programs like CitizenScience.gov, citizen scientists are an increasingly essential part of every type of research study teams. The formation of the Florida-California Cancer Research Education and Engagement (CaRE2) Health Equity Center through the NCI PACHE funding in 2018, created unique resources to develop a cadre of citizen scientists to drive cancer health disparity research in Black and Latinx communities. The program is open to cancer survivors and advocates.

METHODS: The CaRE2 Cancer Citizen Scientist training program builds on our previous experience training cancer advocates and Community Health Workers. Trainee selection was through a competitive application process. Training techniques employed include independent learning, lectures and experiential learning. The CaRE2 Center Planning and Evaluation Core conducted the program evaluation to foster continuous improvement. **RESULTS:** From five applications, four citizen scientists were accepted to the program. One accepted applicant was unable to continue due to illness. The training program focused on Research Advocacy; Research Ethics; Internal Review Board (IRB); Social Determinants of Health; Clinical Trials; Omics; Epidemiology; Bioinformatics and Biobanking. The three trainees participated in a three-part curriculum: (1) one week of independent learning with expert mentors, which included virtual office hours; (2) one week of lectures by expert mentors; and (3) 2-Day experiential training at the University of Florida CaRE2 Labs, which is ongoing. Trainees are also working with student ambassadors who are part of a summer research training program, the C-ReTOOL Program, funded by NCI. The final part of the curriculum is the teach-back component on August 1, 2019, which includes poster presentation of a proposal for an advocacy project focused on addressing cancer disparities. Upon completion of the program, CaRE2 Citizen Scientists will be able to: (1) Discuss three ways that research advocacy is important to improving cancer health equity; (2) Illustrate two examples of ethical cancer research activities that were observed during the experiential training; (3) Determine the relevance of experience sharing and communications between advocates, students, and scientists to the quality of cancer research; and (4) Disseminate research advocacy experiences through presentations

CONCLUSION: The collaborative infrastructure and resources of NCI CPACHE programs, such as the CaRE2 Health Equity Center, is unique for the training of Citizen Scientists. This includes access to outstanding cancer scientists and advocates, who are well experienced in developing research education programs as well as mentoring minority trainees. Potential barriers include onboarding of trainees in academic setting and ensuring that citizen scientists maintain institutional compliance.

B032 African American cancer survivors' perspectives on clinical trial participation at a safety-net hospital cancer center. [Natalie D Hernandez](#)¹, [Raegan W Durant](#)², [Dexter L Cooper](#)¹, [Desiree Rivers](#)¹, [Ebony Reppress](#)¹, [Nedra Lisovicz](#)², [Brian M Rivers](#)¹. ¹Morehouse School of Medicine, Atlanta, GA, USA, ²University of Alabama at Birmingham, Birmingham, AL, USA.

Introduction: Clinical trial participation is essential to the progress of optimizing cancer care outcomes; however, there is a paucity of African American (AA) participation in cancer clinical trials (CCTs) resulting in significant gaps in treatment efficacy. There has been a robust amount of research on ways to increase AA participation in CCTs, but few studies have examined AA recruitment at safety-net hospitals. The objective of this study is to utilize a multilevel, qualitative approach to assess the clinical and non-clinical facilitators and barriers to AA participation in CCTs at a safety-net hospital from the perspective of AA cancer survivors. Methods: Study participants (n=25) were recruited from a cancer center at a safety-net hospital in the southeastern U.S. Eligible participants were individuals who: 1) self-identified as AA; 2) were 18-75 years old; 3) spoke and read English; 4) diagnosed with cancer; 5) had no functional limitations that would interfere with participation in a 60-minute focus group; and 6) be capable of providing written consent for study participation. Focus groups were digitally recorded and transcribed. Data was coded and analyzed to identify the most prominent themes representing unifying ideas and concepts. Results: Theme 1: Understanding of Cancer Clinical Trial Terminology (Barrier). For some of the participants this focus group session was the first conversation they had where they were able to discuss their cancer diagnosis with other survivors. Participants also expressed confusion between clinical trials and treatment; many did not know the difference between the terms. There were instances where patients used the terms incorrectly, especially during discussions about willingness to participate in trials. Theme 2: Perceptions of Cancer Clinical Trials (Barrier). Participants may have heard of clinical trials but did not know what a cancer clinical trial entailed. Once a clinical trial was explained participants expressed that they may have taken part. Some indicated that no medical professionals discussed a clinical trial or recruited them to participate. Participants who were knowledgeable about CCTs expressed that they were ineligible for the trial, although ineligibility also seemed to be confusing for them. Most reported receiving information from pamphlets. Theme 3: Role of Patient Navigator (Facilitator). In general, participants expressed trust in their physicians, particularly for medical information; however, some preferred resources and information from a patient navigator. All agreed that they would be willing to work with a patient navigator and saw the patient navigator's role as providing social support and as a resource. Participants preferred a knowledgeable patient navigator that had cancer experience. Conclusion: Including cancer patient navigators as part of the treatment team staff may help traverse potential barriers to CCT participation, and ultimately increase the number of AAs diagnosed with cancer participating in CCTs.

B033 Patient navigation at NCI-designated, safety-net, and rural cancer centers: Why is tailoring necessary? Dexter L Cooper¹, Vivian Carter², Natalie D Hernandez¹, Mindy Le¹, Kimberly Robinson³, Shawn J Ennis¹, Mona Fouad³, Brian M Rivers¹. ¹Morehouse School of Medicine, Atlanta, GA, USA, ²Tuskegee University, Tuskegee, AL, USA, ³University of Alabama at Birmingham, Birmingham, AL, USA.

Introduction: Recent studies suggest where patients receive cancer care is a determinant of survivorship outcomes. As a culturally and individually tailored approach to addressing barriers to cancer care and other contributors to cancer disparities, patient navigation (PN) is an effective strategy to enhance the efficiency of healthcare systems and continuity of care. Patient navigation programs have emerged as a strategy to reduce morbidity and mortality for cancer and associated late and long-term effects of treatment. This study utilized the Community-Based Participatory Research (CBPR) framework to evaluate an enhanced 'care coordination model', linking navigators with cancer patients at an NCI-designated cancer center, a safety-net hospital cancer center, and a rural hospital cancer center. The purpose of this study is to characterize the implementation of the patient navigation model in three unique clinical settings for cancer care delivery. Methods: Eligible participants were identified from the partnership between Morehouse School of Medicine (MSM), Tuskegee University (TU) and the O' Neal Comprehensive Cancer Center at UAB sites by the health-systems patient navigator (HSPN). The HSPN screened patients to assess their need for navigation services. Those in need of navigation were introduced to the study at their prospective treatment facilities. Patients were linked with community-based patient navigators (CBPNs) to ensure continuity of addressing the clinical and non-clinical effects of treatment. Findings: Navigators aided with service requests; however, there were differences in the types of services requested based on cancer center and treatment status. Participants who were in treatment the NCI-designated cancer center (n=35) were mostly Black (62.9%), female (91.4%), single (45.7%), employed (34.3%), had Medicare (28.6%) and a yearly household income \$5,001 to \$10,000. They mostly requested assistance with gas (88.6%), social support (74.3%) financial assistance (48.6%), and lodging (20%). Participants who completed treatment at the safety-net hospital cancer center (n=20) were mostly Black (85%), female (80%), single (50%), disabled (45%), had Medicaid (55%), and a yearly household income of less than \$5,000 a year (23.5%) and \$15,001 -\$25,000 (23.5%) a year. These survivors requested assistance with food procurement (75%), financial assistance (50%), education (35%), transportation (25%), and clothing (25%). Participants

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who were in treatment at the rural hospital cancer center (n=4) were all Black (85%), mostly male (75%), and half were married (50%). These survivors requested assistance with transportation (50%) and financial assistance (50%). Conclusion: The work of navigators, whether they are health-systems or community patient navigators, is dynamic and valuable to the care of cancer survivors, especially for disparate populations. The adaptability of this model based on the dynamics of the clinical setting emphasizes the utility of this model.

B034 Improving patient-centered care for inflammatory breast cancer: Strategies for addressing barriers faced by patients, researchers, and providers. Larisa Gearhart-Serna, Whitney Lane, Laura Fish, Anh N Tran, [Gayathri R Devi](#), Holly Hough, Kearston L Ingraham. Duke University School of Medicine, Durham, NC, USA.

Introduction: Inflammatory breast cancer (IBC) is a rare but the most lethal breast cancer often misdiagnosed as mastitis or dermatitis since majority of cases lack a clinically apparent tumor mass and present with progressive breast erythema and skin edema. Further exacerbating this is its incidence, more often, in premenopausal women who have yet to initiate regular screening, and/or its manifestation in women of color, in whom the signs of disease may be more subtle. Thus, the goal of this research is to understand IBC awareness and knowledge of clinical signs related to diagnosis and treatment amongst the general public, patients, and primary care providers in order to design effective interventions to improve patient care. Methods: Responses (500+ unique) were collected from a facilitated session and representative post meeting interviews including researchers, clinicians, patients, and community stakeholders on open-ended questions related to IBC diagnosis, treatment barriers, and strategies to improve patient care. For thematic analysis, responses were subdivided into patient/community, provider, and organizational level using NVivo 12 Pro qualitative software. Grounded theory shaped both design and analysis. Results: Based on participant responses, barriers at the patient/community level (69.4%) were recognized to be the greatest. The primary factor identified was related to living in a rural community/distance to a treatment center (21.1%). At the organizational level, obstacles included limited or no access to an appropriate treatment center (42.2%), lack of IBC-specific standard of care (20.0%), lack of central source of information about IBC (20.0%) and need for trained patient navigators (8.9%). This analysis highlighted that patients often experience multiple misdiagnoses before finding a physician that correctly recognizes IBC - 79.4%

responses indicated a lack of education among primary care providers (79.4%), misdiagnoses due to patients not fitting the typical breast cancer profile (13.1%), and a dearth in communication between physicians and patients (7.5%). This study also identified specific strategies, which included developing culturally tailored IBC media campaign and community-facing patient navigation to address barriers such as social support and care for patients in rural or underserved communities. Conclusions: Taken together, three themes in IBC care were identified- a) barriers to timely diagnosis and treatment, b) strategies for community engagement, and c) the need for provider education. These datasets have led to the development of survey instruments to assess gaps of knowledge during diagnosis and treatment in IBC patients and primary care providers including physicians, physician assistants, and nurse practitioners in the community. Supported by Duke SOM Interdisciplinary Colloquium (GRD); DCI Behavioral and Health Survey Research Core Award (GRD, LF, AT); C-REP 1P20-CA202925-01A12 (GRD, HH, LGS, NB); T32 Surgical Oncology training (WL)

B035 Identification of a tumor cell adaptive stress response signaling pathway, which drives aggressive breast cancer phenotype and therapeutic resistance, in African American patients with locally advanced breast cancer subtypes. [Gayathri R Devi](#)¹, Muthana Al Abo¹, Larisa Gearhart-Serna¹, Joseph Geradts², Shannon J McCall¹, Savitri Krishnamurthy³. ¹Duke University School of Medicine, Durham, NC, USA, ²City of Hope Comprehensive Cancer Ctr, Los Angeles, CA, USA, ³MD Anderson Cancer Center, Houston, TX, USA.

Introduction: The higher incidence of biologically aggressive and treatment-resistant breast cancer (BCa) subtypes, which includes triple negative (TN), basal, and inflammatory breast cancer (IBC), contributes to worse survival outcomes in African American/AA patients, 42% higher death rate compared to White BCa. Amongst locally advanced BCa, IBC is a model of aggressive, most lethal, frequently basal/TN, accounting for 10% AA BCa and disparity in outcomes exist after adjusting for socioeconomic and diagnosis factors. IBC exhibits a unique phenotype wherein malignant cells do not form solid masses and instead, present as hyperproliferative tumor cell clusters, termed tumor emboli, in the skin and lymphatics. Our key finding was the identification of a tumor cell adaptive stress response pathway linking the mitogen activated ser/thr kinase/ MNK, X-linked inhibitor of anti-apoptotic protein, XIAP, and nuclear transcription factor, NFkB, mediated proliferative, invasive and immunosuppressive signaling. Our goal was to

determine the role of the adaptive stress response pathway, which we have identified to contribute to aggressiveness of TNBC and IBC, in AA breast tumor biology. Methods: Expression of MNK, XIAP and NFkB target gene sets, a 40-gene oxidative stress response that correlates with response to cell death stimuli and a 79-gene IBC signature (identified from comparative analysis of IBC and non-IBC biospecimens) were evaluated in The Cancer Genome Atlas (TCGA) breast cancer datasets (1109 tumor; 113 normal) stratified according to race and molecular subtypes (luminal A, B, Her2, basal). The mean expression for each gene in these signatures were also assessed among different subtypes and race using R. Gene Ontology (GO) analysis was performed using GATHER online tool. XIAP immunohistochemistry (IHC) conducted in BCa samples (n=93) from Duke and MDACC biorepositories. Results: TCGA analysis of the IBC-related signatures identified genes differentially expressed (>2-fold change; Wilcoxon rank sum test, FDR<0.05) among BCa subtypes and between AA vs White within a subtype. Additionally, the oxidative stress response metagene was significantly upregulated in AA basal (p=0.037) whereas there were fewer differences in immune-related genes within AA subtypes suggesting attenuated immune response. IHC, to date, shows high XIAP in high grade, ER-negative and in majority of AA BCa and in IBC samples independent of molecular subtypes and grade. Conclusions: We report a heightened adaptive stress response gene signature and identify genes in the MNK:XIAP:Nfkb pathway and IBC-related signatures in AA BCa, suggesting potential biomarkers and drug discovery targets. High XIAP expression in high grade BCa, frequent in AA patients, is of therapeutic relevance as XIAP, the most potent caspase inhibitor, is linked to chemo- and immunotherapy resistance and XIAP inhibitors are in clinical trials. Supported by DOD-Breakthrough-W81XWH-17-1-0297; Duke SOM bridge funds; NCI-IP20-CA202925-01A12

B036 Asian Breast Cancer (ABC) Project: Breaking the silence with knowledge and support. [Chien-Chi Huang](#). Asian Breast Cancer Project, Somerville, MA, USA.

The Asian Breast Cancer Project (ABC) is a comprehensive project spearheaded by Chien-Chi Huang, a Taiwanese American breast cancer survivor who is determined to break the silence and raise the awareness of breast cancer among Asian Americans. It aims to provide a community-based, peer-led program to address the lack of breast health/breast cancer education, screening, and treatment among, USA. Asian American women in the Greater Boston area in Massachusetts.

B037 Patient Activation and Navigation: Utilizing Innovative Patient Engagement Strategies to Elevate Knowledge of Breast Cancer and Clinical Trials among African American Women. Geeta Rajamani, Limi Ahmed, Ida Bezabeh, Starla Gay, Taylor MI Hollis, Almnesh Kassa, Liz Kassa, Rhonda McClinton-Brown, Tinebeta Mekonnen, Regene Ross, Regina R. Throvoer-Guillory, Chiquita T. Tuttle, Juanita J. Waugh, Lenora Williams, [Lisa Goldman Rosas](#). Stanford University, Palo Alto, CA, USA

Low recruitment of African American women into breast cancer clinical trials is a significant barrier for addressing breast cancer disparities in this population. Although the incidence of breast cancer among African American and non-Hispanic white women is nearly equal, the mortality rate is 42% higher for African American compared to non-Hispanic white women. This disparity is due to diverse factors such as later stage at diagnosis and limited access to screening and treatment. To effectively address African American breast cancer disparities, there is an urgent need to build capacity among African American women in breast cancer research. The African American Breast Cancer Peer Navigator program was established to engage the African American communities in the San Francisco Bay Area in breast cancer research. We recruited 13 community members interested in serving as peer navigators for one year. To build their capacity in breast cancer, we hosted a series of educational sessions facilitated by local and national experts in topics such as breast cancer disparities, best practices in primary and secondary prevention strategies for advocacy and community engagement, breast cancer survivorship, and breast cancer clinical trials. When possible, these sessions were facilitated by local African American experts. Following capacity building, each peer navigator created their own plan for engaging their local community in breast cancer awareness and research. Peer navigators planned diverse engagement strategies including a radio program, faith-based events, free mammogram screenings, and educational speakers. In total, the peer navigators conducted 10 community engagement activities and reach over 500 of their community members. At the conclusion of the one-year peer navigator program, the group prioritized breast cancer survivorship and secured funding to pilot test a physical activity program for African American Breast Cancer survivors. The peer navigators also continue to meet to promote awareness of breast cancer in their community and affect policies to increase access for African American women to breast cancer resources and services in our local area. The peer navigators will present details of their capacity building activities, community engagement events, and their future research and practice goals.

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B038 A community-based participatory research approach to address healthcare disparities in quality of life of Latino parents of children with cancer. Michelle A Fortier¹, Ramon Garcia¹, Lessley Torres², Sonia Zavala¹, Beverly Mendoza¹, Elisa Ornelas¹, Haydee Cortes², Zeev N Kain¹, Belinda Campos¹. ¹University of California, Irvine, CA, USA, ²University of California, Irvine, CA, USA.

Disparities in quality of life in Latino youth in cancer treatment and their families have been well documented. Parents of children undergoing cancer treatment experience increased stress that impacts physical and emotional health and subsequently, quality of care received by children. Access to supportive interventions may also be limited for Latino caregivers, due to myriad factors such as lack of insurance, income, language barriers, and documentation status. Accordingly, we aimed to address this gap in the literature by engaging in an equitable collaboration with community partners to develop an intervention to improve quality of life in Latino caregivers of children with cancer. Specifically, we utilized a community-based participatory research (CBPR) model to create a community advisory board with which to partner in this endeavor. Spanish-speaking parents of youth who were in or had previously undergone cancer treatment were recruited. We held regular meetings over the course of one year to identify themes of recurring experiences and barriers to optimal quality of life during children's cancer treatment. Meetings were continuously evaluated to ensure adherence to the following CBPR principles: 1. collaborative & equitable, 2. mutually beneficial, 3. co-learning process and were transcribed and coded for thematic elements. Significant themes unique to this population included: increased parental stress given cancer care generally fell to one parent, minimal access to self-care strategies, lack of culturally competent healthcare, lack of access to appropriate health-related information, and language barriers affecting quality of communication and information transfer. These themes were used to identify components of a caregiver intervention that includes modules addressing interactions with healthcare providers, self-care with a focus on stress management, and health literacy. Next steps in this program of research are to vet the intervention components with a larger community advisory board to ensure cultural relevance and appropriateness and develop and implement the intervention. This program of research has the potential to minimize disparities in psychosocial outcomes in underserved Latino families of children with cancer.

B039 I am good but depressed: The mental health impact of breast cancer on the black community. Dorothy Galloway¹, Dede Teteh², Phyllis Clark³, Eudora Mitchell⁴, Rick Kittles², Susanne Montgomery⁵. ¹City of Hope Comprehensive Cancer Center, Duarte, USA, ²City of Hope Comprehensive Cancer Center, Duarte, USA, ³Healthy Heritage Movement, Riverside, USA, ⁴Quinn Community Outreach Corporation, Moreno Valley, USA, ⁵Loma Linda University, Loma Linda, USA.

In the US Black women have higher incidence and mortality rates of breast cancer than White women. Patients diagnosed with breast cancer (BC) are known to experience a decline in mental health (MH). Patient's reactions after diagnosis can involve denial, depression, anxiety, and anger. Close relatives and friends of patients are often also psychologically affected although their involvement and support of the BC patient has been associated with better survival outcomes. There is a gap in our understanding of the mental health impact on Black BC patient's close friends and family members. The purpose of this study is to explore the MH impact of a BC diagnosis on Black BC patient's close friends and family. Methodology: Analysis were conducted on a data set of African American (AA) and African/ Caribbean (AC) Women in Southern California. The data were collected from 2014-2016, using a 40-item questionnaire. Analysis included descriptive and inferential statistics. Survey data was analyzed using SPSS Version 25. Results: In our sample (N= 172), 57.8% of respondents were relatives and friends of patients with BC, compared to 35.1% of respondents who were not impacted by the disease. AA (81.3%) were significantly more impacted by BC than our AC participants (57.4%) ($p=0.001$). While the self-reported MH status of the respondents was *excellent* (46.4%) or *good* (35.7%) overall and no one reported their MH status as *poor*, among participants impacted by the disease ($n=105$), a higher proportion (18.1%) reported feeling depressed *several days* ($p=0.61$) versus those who were unaffected ($n=60$) by BC (13.3 %). It is important to note, when we analyzed the entire sample of the study (i.e. those with family and friends with breast cancer and those without), there was a significant difference in our respondents' self-report of their MH status and feelings of depression ($p=0.008$). Discussion: AA and AC women often have poorer recovery outcomes from BC than White women, including MH issues, though little is known about the MH on the Black BC patients' close family/friends. In this study, most participants reported their MH as *excellent* or *good* and although not statistically significant, we found some differences if respondents reported having a close relative/ friend with a history of BC. Our findings point to the need for future studies to better link the diagnosis temporally with BC and should consider if the instrument is appropriate for this

community considering the discrepancy in the interpretation of MH versus depression. Future research should consider creating culturally tailored tools to assess the MH impact of BC diagnosis on patients' relatives and friends.

B040 GRECO: A novel patient-centered research methodology to broaden participation in clinical research.

Linda Higashi, Naveen Kumar, Victoria Raymond, Mark Jacobstein, Kathryn Lang, Colin Small. Guardant Health, Inc., Redwood City, CA, US.

Whilst advances in clinical research have been made rapidly in the field of oncology research, there remains significant unmet medical need in reaching traditionally under-represented groups (low socioeconomic status, non-academic medical centers, rural populations and ethnic minorities). With the advent of the 21st Century Cures Act, the field of secondary research has become increasingly systematized but issues remain with access, reproducibility, and data ownership. The value of real-world clinico-genomic datasets in understanding the utility of medical interventions in real-world clinical practice cannot be underestimated and is becoming increasingly relevant in therapeutic areas where traditional interventional research is not feasible or economically viable. Current approaches to the execution of 'real-world data' studies often lack engagement of subjects and are limited by institutional and technological "data siloes". The GRECO study is a novel, patient-centered approach to accessing and understanding patient clinical data and developing more comprehensive clinico-genomic datasets. The GRECO study, sponsored by Guardant Health (GH), was designed as a pilot to investigate the feasibility and acceptability of a direct-to-patient approach to gain informed consent from patients to participate in a pragmatic study of individuals with a diagnosis of lung cancer and at least one GH diagnostic test with reported results (taken in the course of routine clinical care). Patients were contacted by a clinical research coordinator by both telephone and email within a 60-day window from the index date and invited to enroll in the study via an online study platform with IRB-approved eConsents and medical records release form. Recruitment of the IRB-approved pilot cohort was completed within six weeks. Medical records and imaging were obtained directly from providers identified by enrolled subjects, data abstracted electronically and manually with source document verification completed to ensure quality, and data reviewed. These data were combined with results from the GH database to develop a clinico-genomic database consisting of data from subjects who have willingly provided consent to have their data collected and studied for research purposes.

Based on the result of this pilot, we believe the GRECO approach represents a novel approach to the execution of real-world data studies that engages patients as active and willing participants and results in a more comprehensive view of the longitudinal patient journey. The promise of real-world clinico-genomic data will only be realized fully if the centrality of the patient in the process is remembered. As a responsible data steward and with an organizational commitment to furthering the understanding of cancer and its treatment, GH believes that this novel approach to trial design, real-world data research and patient involvement could benefit many underserved and under-represented groups and bring valuable new insights to clinical care.

B041 Community-health worker delivered weight loss and maintenance intervention for rural African American adults.

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Introduction: Excess body weight is a critical modifiable risk factor for numerous cancers and one of the top public health problems in the country. Unfortunately, underserved groups bear a disproportionate burden, with African Americans having the highest rates of obesity. Behavioral weight loss interventions have been recommended by several governmental agencies to treat obesity and improve cancer risk, control, and survivorship. However, health care provider shortages in underserved areas have resulted in access gaps. Community Health Workers (CHWs), trusted community members, have filled these gaps and been successful in changing health behaviors (e.g. dietary intake, screening), associated with weight loss or cancer, but have not been thoroughly engaged to deliver evidence-based behavioral weight loss interventions. To increase reach among the underserved, community-based weight loss and maintenance interventions are critical. Methods: Building on a 10+ year partnership between community and academic researchers, an evidence-based behavioral weight loss program was adapted for African Americans of faith to create a group-based, CHW-delivered weight loss and maintenance intervention. With the intention of recruiting two CHWs per church, a total of 61 CHWs were recruited and underwent 28 hours of training over 4-6 weeks to deliver the intervention. A total of 31 churches were randomized to a Weight Loss Only arm (16 core lessons) or a Weight Loss + Maintenance arm (16 core + 12 maintenance lessons) in this cluster randomized controlled trial (n=440). Actual weight and height (BMI—

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body mass index), dietary behaviors, and physical activity were assessed at 0, 6, 12, and 18 months. Linear mixed models and fit by restricted maximum likelihood were implemented using SAS 9.2. All analyses were conducted with the intention-to-treat principle. Results: The intervention produced significant weight loss from baseline to 6-months (-2.47 (-3.13, -1.80)), with 23.7% of all participants losing at least 5% of their body weight. Among those with clinically significant weight loss ($\geq 5\%$) at 6 months, there was a statistical trend of lower weight regain in the Weight Loss + Maintenance at 12 months. Participants in the Weight Loss + Maintenance arm also reported higher levels of physical activity at 12 months. There were no significant differences between arms at 18 months. Discussion: The intervention produced significant weight loss from baseline to 6-months on par with other evidence-based weight loss interventions for African Americans, including adaptations that utilized health professionals. Compared to health-care professionals, CHWs may be a more cost-effective way to deliver evidence-based behavioral weight loss interventions. Engagement of institutional infrastructures already in place in communities, such as churches, may be a feasible way to sustainably implement and disseminate evidence-based weight loss interventions for those not reached by traditional healthcare institutions

B042 Identifying effective interventions using community-based participatory practices to improve cancer-related health outcomes in a high-risk population. Tyrell T Mann-Barnes, Grace X Ma. Temple University, Philadelphia, PA, USA.

Persons Living with HIV/AIDS (PLWHA) have an increased life expectancy when they adhere to highly active antiretroviral treatment (HAART). At the same time, ~25% of AIDS related deaths are due to non-HIV related comorbidities including cardiovascular disease, atherosclerosis, and hypertension. In the aging PLWHA population on HAART, an increasing risk for multiple cancers is clear and the cancers are more aggressive and advanced compared with an age-matched population. In addition to the liver cancer related to Hepatitis B and C, genital cancers related to human papillomavirus (HPV), increases in non-immune cancers including lung and melanoma cancers are the leading causes of death in PLWHA. Evidence has shown that community-based participatory approaches can be used to improve health outcomes in many populations. In this study, we focus on interventions for at-risk African-American, HIV positive, Men having Sex with Men (MSM) population. Typical community-based participatory activities include cancer-related awareness, prevention, diagnosis, and treatment. We plan to utilize partnerships

with community-based AIDS service organizations (ASO), community leaders, and local community state-representatives. Preliminary data shows that partnering with city-wide programming initiatives such as Black Gay Pride, Philly Pride Present and National Coming-Out Week will ensure community participation, leadership and engagement among the community. Currently, there is little research on how best to reach the Black or Hispanic PLWHA community. This project will investigate the socio-political-economic factors impacting these populations and the interventions that will increase engagement with healthcare educators and providers. Furthermore, knowledge from the PLWHA will help devise preventative approaches for reducing and addressing cancer risks.

B043 Getting proximate: Facing the truth about African American hereditary breast cancer research – insight from Alabama. Nancy Merner¹, Elizabeth Stallworth¹, Madison Bishop¹, Sophonie Omeler-Fenaud¹, Isaac McNeely¹, Anna Huskey². ¹ Auburn University, Auburn, AL, USA, ² Auburn University, Auburn, AL, USA.

If there is any place to overcome research barriers it is Alabama. Known for being the site of one of the most unethical and inconceivable clinical studies - The Tuskegee Syphilis Study - and home of nearly double the national percentage of African Americans (AAs), history itself provides a substantial challenge. In Alabama, 85% of the counties are entirely medically underserved, most of which are rural, including the Alabama Black Belt, which is predominantly inhabited by AAs and associated with low economic status. Altogether, one can gather that getting proximate requires dedication, and considering all of the reported AA cancer health disparities, it is vital to address these barriers. Aiming to study hereditary breast cancer (BC) and other associated cancers in Alabama, we had to be adaptable and develop recruitment strategies appropriate for the community. In a recent publication, we described our initial efforts that were effective for recruiting AAs into the Alabama Hereditary Cancer Cohort (AHCC). A number of facets were key to this success, which included establishing community partners, educating and building trust in the community, and utilizing a recruitment bus, called the Gene Machine. As AA BC susceptibility is widely understudied, we realize the need to continue this effort; however, we recently went back to the drawing board and revamped our recruitment protocol in order to maximize our time and efficiency. We currently have over 150 AAs in the study and plan to bolster recruitment by implementing the protocol modifications. Ultimately, the goal of these rigorous efforts is to add to the limited, existing

resources, i.e. biospecimens and genetic data, needed to better understand the science of cancer health disparities. When cancer-affected individuals enroll into our study, we carry out gene panel screening, initially searching for clinically significant variants in cancer susceptibility genes. Though our screening is currently research-based, through the development of our protocols, we felt it was important to offer the option to receive genetic research reports during the consent process. We had anticipated that many of our study participants would not have access to the care that provides such knowledge, and we have since confirmed that only ~20% of the cancer-affected AAs in the AHCC had previous clinical genetic screening. It was evident that most of those participants wanted such information with only 2% declining to be informed of the research results. Realizing that access to care is very limited in Alabama, we also established a collaborative tele-genetic counseling project to provide services to mutation carriers in their local county health departments. Coupled together, these efforts attempt to provide study participants with a better understanding of disease risk and management, and allow integral genetic research to be carried out as we work towards reducing cancer health disparities. If there is any place to overcome barriers, it is here in Alabama and it is happening.

B044 Assessing knowledge and perceptions about cancer among American Indians of Zuni Pueblo, New Mexico. [Safia Safi](#)¹, Donica Ghahate², Jeanette Bobelu², Angela Wandinger-Ness², Thomas Faber³, Shiraz Mishra², Cheryl Willman², Vallabh (Raj) Shah². ¹University of New Mexico, Albuquerque, NM, USA, ²University of New Mexico, Albuquerque, NM, USA, ³Indian Health Services, Zuni, NM, USA.

New Mexico is one of the most geographically and culturally diverse states and faces serious cancer health disparities among its poor, rural, and ethnically diverse populations of American Indians (AIs). They have lower cancer screening rates compared to other populations and are more likely to be diagnosed with a later stage of cancer but less likely to receive treatment (Li et al, 2003). In turn, AIs have the lowest five-year cancer survival rates compared to any ethnic/racial group in the US (Clegg, 2002; Edwards, 2005). Numerous barriers such as cultural beliefs in health and health care, fear, fatalism, mistrust, stigma and lack of culturally appropriate interventions contribute to low cancer screening rates and low cancer survivorship (Daley et al, 2012; Filippi et al, 2013; James et al, 2013). Zuni Health Initiative conducted a community-based participatory research project in collaborations with community stakeholders from the Zuni Pueblo to assess knowledge and perceptions about common

cancers among Zuni adults. We used trained Community Health Representatives (CHRs) from Zuni along with Zuni undergraduate students who led six one-hour focus group sessions using structured questionnaire with probes designed to illicit information on knowledge and perceptions about cancer among Zuni adults. The focus groups were conducted among 51 participants from different age groups (20-29 yrs, n=19; 30-49 yrs, n=17; and 50 yrs and older, n=15) stratified by gender. Focus groups were conducted in English and Shiwí language and were audio recorded, with the Zuni students maintaining extensive notes on the focus group discussions. The Zuni CHRs transcribed the audio recordings, and developed a codebook based on the transcriptions and notes for the qualitative data analysis. Overall, the responses given by participants fell into three distinct categories including, (1) a general lack of knowledge, (2) the perception that the disease is uncontrollable in nature, and (3) general negative connotations. Although some participants acknowledged that cancer could come in many forms, there were many participants who were uncertain about the different factors that contribute to the disease, as well as specific outcomes associated with the disease. Many participants mentioned cancer being uncontrollable in nature, that cancer always comes back, and expressed that death is the inevitable outcome. Finally, several participants displayed general uncertainty and discomfort when discussing cancer. There was negative connotations when participants heard the word “cancer”, as well as construed negative implications about discussing personal experiences with cancer. Findings from this formative study provides evidence that can guide the development and testing of interventions aimed at enhancing knowledge about cancer and cancer-specific screening practices.

B045 Operationalizing community engagement and participation: Experiences of the Yale Cancer Disparities Firewall Project to impact lifestyle change and cancer screening. [Sakinah C. Suttiratana](#)¹, Monique Killins¹, Denise E. Stevens², Jose DeJesus¹, Roy Herbst³, Beth A. Jones¹. ¹Yale School of Public Health, Yale Cancer Center, New Haven, CT, USA, ²MATRIX Public Health Solutions, Inc., Providence, RI, USA, ³Yale School of Medicine, Yale Cancer Center, New Haven, CT, USA.

Background The Yale Cancer Disparities Firewall Project addresses racial/ethnic minority and low socioeconomic status disparities in cancer screening and outcomes by translating evidence-based practices and guidelines into wrap-around support for these populations. Tailoring cancer disparities activities to local needs requires community

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engagement and participation (CEP). Operationalizing CEP is challenging though its value as a tool to adapt scientific and behavioral knowledge into acceptable patient-level interventions and programs has been recognized. We explored a range of CEP activities implemented within our project to understand and classify the use, outcomes and limitations of community engagement. Methods Comparative qualitative methods highlight variations in how CEP is operationalized. Data from group interviews (n=58; 66% Hispanic and 31% African American) and archival documents were synthesized based on models defined by Popay et al (2006) and Brunton et al (2017). Purposive samples of church-goers, members of a university-convened, community liaison group and a community action network (CAN) established to advise and promote CEP around healthy lifestyles and cancer screening were interviewed. Documents included minutes from a community research engagement subcommittee and supervision meetings for a lay health leader. The research team thematically coded data considering the process, timing, activities, expectations and power dynamics of community engagement. Gaps in community knowledge and access to cancer screening and services were also noted. This poster includes an electronic polling station that collects reader experiences. Results Empirical themes and process maps demonstrate the utility of different types of CEP. Most commonly, community members requested that cancer experts share more information with local populations. CEP generated voluminous suggestions about the outreach process, cancer communications content and channels, and potential barriers to reach and uptake. Additionally, we identified four ways of operationalizing CEP: a) operations advising, b) community knowledge assessment, c) program/intervention planning, and d) document development. Using quotations and visual data, we describe the range of CEP activities, the extent of engagement and institutional capacity required to facilitate each type. A framework for iterative CEP and bidirectional education to advance cancer risk reduction and screening objectives is proposed. Conclusion CEP encompasses diverse activities and can provide practical guidance for project implementation. By examining institutional context and CEP history, researchers may implement CEP more intentionally by presenting scopes of work, degree of engagement and output integration plans to CEP participants. Additional research is needed to demonstrate whether fit-for-purpose use of CEP results in different outcomes.

B046 Incorporating Latino patient input in patient-facing materials for a mailed fecal test outreach program. Jamie Thompson¹, Melinda Davis², LeAnn Michaels², Jennifer

Rivelli¹, Marta Castro³, Brittany Younger³, Melissa Castillo³, Sacha Reich¹, Gloria Coronado¹. ¹Kaiser Permanente Center for Health Research, Portland, OR, USA, ²Oregon Health & Science University, Portland, OR, USA, ³AltaMed Health Services, Los Angeles, CA, USA.

Colorectal cancer screening rates are disproportionately low among Latinos. In 2015, only 63% of eligible adults, and 50% of Latinos, were up-to-date with colon cancer screening recommendations. One factor thought to contribute to the low screening rate is that patient-facing health information for Latinos is difficult to understand and patients face challenges in taking health action. As part of the Participatory Research to Advance Colon Cancer Prevention (PROMPT) study, we used boot camp translation (BCT), a community based participatory strategy, to elicit input from stakeholders and refine materials for a clinic-based mailed fecal immunochemical test (FIT) outreach program. Eligible patient participants were Latino, ages 50 to 75 years, able to speak English or Spanish, and willing to participate in an in-person meeting and follow-up phone calls. Separate sessions were held for English- and Spanish-speaking participants. The in-person session included presentations by a national expert on colon cancer prevention and screening messages, and interactive small group sessions to discuss optimal timing and modality for delivering reminders to a mailed FIT program. The phone calls consisted of iterative conversations to refine bilingual materials to encourage screening. BCT participants desired messages that increased awareness about colon cancer and prevention, stressed the importance of screening, emphasized the motivating influence of family, and used personalized statements such as an "I" or "we" in letters or automated phone calls. These preferences were incorporated into outreach materials. (Samples will be provided.)

1-Patient Introductory Letter Included in the FIT Kit Mailing. Revisions recommended by BCT participants included 1) details about colon cancer and the need for prevention, 2) emphasis on a free test, 3) inclusion of a photograph of a multigenerational Latino family, 4) the addition of a colon diagram for visual appeal and education, and 5) messages about how screenings can save lives. The group also wanted emphasis on the test being "simple" and "something you can do at home." 2-Educational Fact Sheet. We also developed a bilingual fact sheet using participant-preferred messages and simple infographics from the BCT expert presentation. The fact sheet presented statistics about colon cancer diagnoses and deaths, and answered the following questions: "What is colon cancer? When should I get tested? How do I get tested?" 3-FIT Kit Wordless Instructions. We found that patients generally preferred simple, wordless instructions, reporting they were less intimidating and helpful as they

showed the small amount of fecal matter needed for the test. We developed FIT wordless instructions based on these findings and included the document with the mailing. Using BCT, we successfully incorporated feedback from English- and Spanish-speaking Latino patients to design and enhance culturally relevant materials to promote FIT testing among patients served by community clinics.

B047 Community-academic partners working in a small grants program.

Karoline Sondgeroth, Rebecca Palacios, [Graciela A Unquez](#), Mary O'Connell, Helena B Loest, Kaitlin Englund. NMSU, Las Cruces, NM, USA.

Community-based participatory research can help reduce health disparities among underserved populations. The New Mexico State University - Fred Hutchinson Cancer Research Center Partnership for the Advancement of Cancer Research (NMSU – Fred Hutch PACR) aims to reduce cancer health disparities in part through the establishment of community-academic partnerships. The Outreach Core of the PACR has supported a small grants program since 2015 to award funds to competitive community-academic partnership teams addressing regional cancer or health disparities issues through health education. Each year, the Outreach Core staff presents a grant-writing workshop to assist community groups in the development of competitive proposals and to identify academic partners at NMSU. Participants at the grant-writing workshop submit proposals, which are then reviewed by two NMSU faculty researchers. All participants, including the awardees, receive the reviewers' feedback on their proposal. Over the past four cycles, the grant-writing workshop has trained 60 community members. The top two proposals are funded each year. To date, eight different proposals have been funded, six at \$7500 each and two at \$5,000 each. All of the funded projects undergo an IRB review at NMSU before the start of the research project. The NMSU academic partners are involved with the community groups through the design, submission of Human Subjects protocol to the IRB, and through data analysis and reporting. Examples of small grant proposals will be presented, including a discussion of how their partnerships worked. This interaction between the community groups and research academics increases the relevance of academic research by assisting the community groups in evaluating their novel educational interventions through robust research projects. Furthermore, these small grant partnerships may serve to provide pilot data for more extensive efforts funded by other agencies.

B048 HPV vaccination in Hmong-American adolescents: A multilevel and assets-based qualitative study.

[Serena Xiong](#)¹, Maiyia Y Kashouaher², Bai Vue², Kathleen A Culhane-Pera², Shannon L Pergament², Jay Desai³, Hee Yun Lee⁴. ¹University of Minnesota School of Public Health, Minneapolis, MN, USA, ²Somali, Latino, and Hmong Partnership for Health and Wellness, Saint Paul, MN, USA, ³HealthPartners Institute, Bloomington, MN, USA, ⁴University of Alabama, Tuscaloosa, AL, USA.

Background: Rates of human papillomavirus (HPV) vaccine uptake in Hmong-Americans, an Asian American and Pacific Islander (AAPI) minority group, are substantially lower than the majority of Americans. In 2015, a community health center (CHC) in Minnesota found that HPV vaccine rates for Hmong children ages 9-17 were 32% in girls and 20% in boys, much lower than nationally published HPV coverage rates in 2017 (47% and 53%, respectively). This qualitative study identified barriers, facilitators, and decision-making processes about HPV vaccinations among Hmong adolescents and parents. Methods: Hmong adolescents (14-17 years old) and their parents were recruited from a local CHC to participate in focus group sessions. Using a community-based participatory action research approach, bilingual community researchers conducted eight focus groups with adolescents and parents. Prior to focus groups, participants provided demographic information and completed a survey about HPV and HPV vaccination. Focus group transcripts were analyzed using participatory thematic analysis. Themes were codified using a socioecological model (multilevel) framework combined with an assets lens. Results: A total of 12 adolescents and 13 parents participated in the focus groups (N = 25). Both survey and focus group results showed that Hmong adolescents and parents had low levels of awareness regarding HPV or the HPV vaccine. At the individual-level, both adolescents and parents reported concerns about side effects and costs as potential reasons for not getting vaccinated. Whereas, an individual-level facilitator for both adolescents and parents included personal agency (i.e., individual desire to want to learn more about HPV and the HPV vaccine). At the community-level, barriers included community narratives around traumatic experiences with vaccine, and facilitators included strong community connections and communications. At the institutional-level, barriers included lack of a school policy requiring HPV vaccinations and structural constraints in health care settings, while facilitators included ease of obtaining vaccines at school-based clinics and provider authoritative decision making. Finally, there was a range of decision-making processes between parents and adolescents and parents and providers. Conclusion: A culturally-appropriate HPV

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educational program for Hmong adolescents and parents could address barriers and build on facilitators and assets to promote HPV vaccine uptake. These findings have been used in the development of an eHealth application to increase HPV vaccinations in Hmong adolescents. Future research studies that test the feasibility, acceptability, and efficacy of culturally-tailored, multilevel HPV vaccination interventions may provide evidence about the efficacy of culturally-appropriate education in comprehensive vaccine strategies.

B049 Psychological underpinnings of cervical cancer screening intentions among the underserved: An examination of the influence of cancer fatalistic notions and associated cognitions. [Carlos O Garrido](#). University of Arizona, Tucson, AZ, USA.

Cervical cancer screening participation is squarely determined by judgment and decision-making, but research examining the influence of cognitive biases on screening decisions remains scant. For instance, the implications of fatalistic views of cancer has been studied in the past, but no other research has furthered explored the psychological underpinnings of cancer fatalism and related constructs in relation to cervical cancer screening intentions. Critically important, however, is to explore the nature of the relationship between cancer fatalism and two related cognitions—cancer information overload (confusion and overwhelming feelings toward cancer information) and cancer information avoidance—for the development of effective psychological interventions. Another wrinkle is added when considering the social demographics of potential screening-seekers due to the health disparities of cervical cancer (Bazargan, Bazargan, Farooq & Baker, 2004) and high endorsement of cancer fatalism among minorities and other disadvantaged groups (for a review, see Espinosa de los Monteros & Gallo, 2011). Another chief aim of this current work was to examine the relationships between the constructs of interest in relation to the three components implicated by the theory of planned behavior (see Ajzen & Madden, 1986) as most predictive of behavioral intent. That is, attitude toward cervical cancer screening, subjective norms about cancer screening (what person believes others think she should do), and perceived behavioral control over getting cancer screening were the outcome variables. I recruited 90 community women from an online subject recruitment forum and presented them with the measures of interest in random order. Results showed that cancer fatalism and cancer information overload predicted negative attitudes toward cervical cancer screening. Cancer fatalism also predicted subjective norms but not perceived

behavioral control. Educational attainment and access to health insurance were also associated with cancer fatalistic thoughts, but not minority status. Lastly, cancer information avoidance (effect modifier) interacted with cancer fatalistic thoughts in predicting attitudes toward cervical cancer screening and intentions to adhere to Pap exam recommendations. Theoretical and practical implications to public health promotion are discussed.

B051 Understanding patient-reported barriers to colorectal cancer screening: A literature review. Colin Small, Victoria Raymond, Mark Jacobstein, [Kathryn Lang](#). Guardant Health, Inc., Redwood City, CA, US.

Colorectal cancer (CRC) is the third-most commonly diagnosed cancer among American adults and is estimated to cause the second-most deaths among all types of cancer. However, compliance with the American Cancer Society guidelines for CRC screening remains low. Many authors have studied reasons for screening non-compliance within specific populations, but a consistent understanding of non-compliance among the general population remains elusive. In order to determine the major patient-reported barriers to CRC screening, we conducted a literature review of studies of patient-reported barriers to CRC screening. PubMed and Google Scholar were searched with the terms: “(colorectal cancer OR CRC) AND screening AND (decisions OR uptake OR barriers OR participation OR compliance OR adherence)” and “patient reported barriers to CRC screening”. Inclusion criteria for the literature review were: Original research on patient reported barriers to CRC screening, patient population includes adults with no history of CRC, research quantifies responses. Individual barriers reported in each study were coded into eight author-defined categories of commonly-cited barriers: lack of awareness of screening (awareness), cost of screening (cost), lack of doctor order, psychosocial barriers (fear, embarrassment, disgust, etc.), lack of time for screening (time), logistical problems to screening (logistics), belief that screening is unnecessary (beliefs), and other barriers (other). Of 9,718 studies assessed, 46 met quality and relevance standards. 28 analyzed barriers exclusively in the US; the rest analyzed barriers elsewhere in the world. Worldwide, lack of doctor order was the most commonly cited barrier to CRC screening. In the US, this is followed by awareness, cost, beliefs, logistics, time, psychosocial barriers, and other barriers. Elsewhere in the world, barriers follow a similar order, in particular and from most to least relevant: lack of doctor order, beliefs, psychosocial barriers, awareness, time, logistics, cost, and other barriers. This review shows that lack of doctor order is a

significant barrier to screening. Thus, it would appear that the most effective screening compliance intervention would be aimed at clinician education, as increased clinician education should increase screening suggestions made in consultation which appear in this research to have a significant impact on patient behavior. Furthermore, health providers should be cognizant of these patient-reported barriers to CRC screening when developing interventions. Future research should analyze differences in compliance among populations of different socioeconomic status (SES), as low SES is a commonly cited predictor of poor screening compliance.

B052 Use of video education interventions to increase underrepresented minority cancer survivor participation in clinical trials: A review. [Timiya S. Nolan](#)¹, Ya-Ning Chan², Ashley Leak Bryant², Jennifer S. Walker², Ana' M. Bell¹, Rachel Hirschey². ¹The Ohio State University, Columbus, OH, USA, ²University of North Carolina at Chapel Hill, Chapel Hill, NC, USA.

Background Less than 5% of eligible adult cancer survivors participate in cancer clinical trials. Compared to 1.2% of non-Hispanic Whites, underrepresented minority (URM) survivors are less likely to participate in clinical trials (0.7% of Blacks, $P < .001$; 0.4% of Hispanics, $P < .001$). Yet, URMs experience disparities in cancer-related morbidity and mortality. Clinical trials need adequate URM representation in samples to generalize findings for reduction of cancer disparities. There is a critical need to identify interventions that increase URM participation in clinical trials. Common barriers to URM participation are lack of knowledge, lack of access, fear, and mistrust. Thus, educating URM survivors about clinical trials with videos may be an effective intervention. The purpose of this systematic review was to understand the use of video education interventions to increase URM survivor participation in clinical trials. **Methods** In October 2018, the authors searched Web of Science, Embase, PubMed, Cochrane, PsycInfo, and CINAHL databases for all articles that described or tested video interventions aimed at increasing adult, URM survivor participation in clinical trials. Two authors independently screened articles for inclusion, appraised quality, and abstracted relevant data. All authors synthesized the data into themes. **Results** The search yielded 2,518 articles. Of these, seven articles describing six distinct interventions met criteria for inclusion. Quality of the included studies appraised as fair to good. Though the six interventions reduced barriers to participation in clinical trials, they reported variable findings on readiness to enroll and/or actual participation of Black and Hispanic survivors of various cancers (largely breast). Five themes emerged:

1) cultural sensitivity application in video development and delivery; 2) video content aimed to educate and change attitudes about clinical trials; 3) video interventions were feasible but lacked power to detect effects; 4) predictors of readiness and participation within URMs were not consistently related to socioeconomic factors; and 5) racially congruent clinical trial coordinators, along with videos, may yield more favorable intervention effects. **Conclusions** Video interventions are well-received by URM survivors and may improve URM representation in clinical trials, yet they are underutilized. With widening cancer disparities and rapidly changing cancer care, more rigorous studies are needed to establish best practices for video interventions used to increase URM participation in clinical trials.

B053 Factors that influence prostate cancer treatment decisions: A qualitative study among a diverse, population-based sample of men with low-risk prostate cancer in Northern California. [Salma Shariff-Marco](#), Janet Shim, Laura Allen, Mei-Chin Kuo, Kathie Lau, Todd Golden, Zinnia Loya, Alice Guan, Mindy C. DeRouen, Debora Oh, Daphne Lichtensztajn, TAP Study Team, Scarlett Lin Gomez. UCSF, San Francisco, CA, USA.

Background: Most men diagnosed with prostate cancers of low grade and low potential for progression are expected to have comparable survival as other men their age without prostate cancer. Thus, active surveillance (i.e., closely monitoring the course of disease with the expectation to intervene given evidence of cancer progression) is universally recommended as a viable management option for men with these tumors. However, men may not be adequately informed about their treatment options; for example, there is evidence that active surveillance is less frequently discussed with underserved men, such as minorities, those of low socioeconomic status, or those with limited English proficiency. **Methods:** This study is the first (qualitative) phase of a sequential mixed-methods study to explore factors that influence prostate cancer treatment among a diverse group of men with low risk disease. We conducted 43 in-depth interviews with patients diagnosed within the prior 24 months with low-risk prostate cancer recruited from the Greater Bay Area Cancer Registry (13 Asian Americans, 10 African Americans, 10 Latinos, and 10 Non-Hispanic Whites). Interviews were conducted in English, Spanish, Cantonese, or Mandarin. To date, 38 interviews have been transcribed, and coded in Dedoose using 29 codes. Three study staff reviewed all interview excerpts tagged with each code to identify factors that played a role in patients' decision-making. These factors were then incorporated into an epidemiologic survey

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being developed for the second (quantitative) phase of the study. Results: Themes related to treatment decision-making include: concern for and obligation to partner/family, others' experiences with treatment, clinical factors (grade/stage), health insurance, medical mistrust, cancer-related anxiety, comorbidities, race/ethnicity/culture, and religion/spirituality. We incorporated these themes into the quantitative survey by drafting survey items on: burden on family members, experiences of family/friends with cancer, avoidance of repeated tests, anxiety related to anticipation of test results, preference for immediate action rather than waiting to see whether the cancer progresses, personality and coping preferences, cultural factors (e.g., stigma regarding cancer, norms/expectations regarding manhood), and life stage and lifestyle. Most of these items have not been included in prior surveys of prostate cancer treatment decision-making. Conclusions: We identified many novel factors influencing treatment decisions among a diverse group of prostate cancer patients in the Greater San Francisco Bay Area, illustrating how a mixed-method approach can be used to augment knowledge regarding treatment decision-making in diverse populations. Ongoing quantitative work will examine the importance of these factors among a larger study population. This work will assist providers to better support patients with low risk prostate cancer as they go through the treatment decision-making process.

B054 Development of a decisional values measure for lung cancer screening among long-term African

American smokers. *Randi M. Williams*¹, Kathryn L. Taylor¹, Cheryl L. Knott². ¹Georgetown University, Washington, DC, USA, ²University of Maryland, College Park, MD, USA.

Introduction: The burden of lung cancer is significant for African Americans, especially African American men, who have the highest lung cancer death rates compared to all other racial and ethnic groups. There is mounting evidence that lung cancer screening via low-dose computed tomography (LDCT) reduces lung cancer-specific mortality. However, due to the limitations and possible harms associated with LDCT, most medical organizations are endorsing the process of informed and shared decision-making. To promote informed decision-making in this context, individuals' decisional needs must be met, including addressing any gaps in knowledge about lung cancer and lung cancer screening, considering personal values related to screening, and the role the patient wants to play in the decision-making process. To avoid racial disparities in screening rates for LDCT, which will ultimately increase the racial disparity in lung cancer mortality, it is important

to uncover any considerations unique to patients who are eligible for LDCT. Methods: Key informant interviews (N=9) identified factors important to African American smokers' screening decisions. Based on these interviews, we developed decisional values items for LDCT and report initial psychometric properties. The pool of items was administered to a convenience sample of 119 African American smokers. Results: An exploratory factor analysis revealed two components explaining 64% of the variance. The components were Cons of Screening (e.g., '...screening will not find all lung cancers or all lung cancer early') and Pros of Screening (e.g., 'lowering your risk of dying from lung cancer'). The final 12-item measure had very good internal consistency ($\alpha=.89$ overall; $\alpha=.86$ and $.88$ for subscales, respectively). To determine whether the decisional values items predicted participants' intention to be screened for lung cancer via LDCT in the next six months, linear regression analyses were conducted with the sub-scales. The Pros of Screening sub-scale significantly predicted screening intentions such that higher reported pros were associated with greater likelihood of screening intention ($B=.10$, $SE=.04$, $p<.05$). The Cons of Screening sub-scale was not significantly associated with likelihood of screening. Conclusion: Values may be specific to the type of decision and the characteristics of those making the decision. This tool provides a promising values measure for lung cancer screening among African Americans and could inform future values clarification tools promoting informed decision-making. Our next steps in this line of research will include conducting cognitive testing of the items and assessing the reliability of this tool in sub-groups.

B055 Translating research into practice: Early lessons from a pragmatic clinical trial to reduce disparities in breast cancer treatment through a regional patient navigation

collaborative. *Amy LeClair*¹, Stephenie Lemon², Jennifer Haas³, Rachel Friedman⁴, Howard Cabral⁵, Karen Burns-White⁶, Nicole Casanova⁷, Karen Freund¹, Tracy Battaglia⁷. ¹Tufts Medical Center, Boston, MA, USA, ²University of Massachusetts Medical School, Worcester, MA, USA, ³Massachusetts General Hospital, Boston, MA, USA, ⁴Dana-Farber Cancer Institute, Boston, MA, USA, ⁵Boston University School of Public Health, Boston, MA, USA, ⁶Dana-Farber/Harvard Cancer Center, Boston, MA, USA, ⁷Boston University School of Medicine, Boston, MA, USA.

Racial and socioeconomic disparities in breast cancer mortality persist; in Boston, Black women and Medicaid patients are 2-3 times more likely to have delays in initiating cancer treatment compared to their white and privately insured counterparts. Evidence-based strategies for combating delays exist but are not systematically

implemented. Our primary research question is: can systematically implement evidence-based coordination of care across the city of Boston to reduce delays for the most vulnerable women? Translating Research Into Practice (TRIP) addresses racial and socio-economic disparities using the principals of community engaged research. Four of the Massachusetts Clinical and Translational Science Institutes (CTSI) have collaborated with the Boston Breast Cancer Equity Coalition, the Boston Patient Navigation Network, and a Clinical Advisory Panel to systematically implement an evidence-based coordination of care intervention in six Boston hospitals. Key components of the intervention include: patient navigation, a shared regional registry to track women across institutions and facilitate navigator coordination, systematic screening for social barriers to care and referral to free or low-cost community resources. The multi-component implementation strategy includes ongoing stakeholder engagement, navigator performance review and feedback, training and support and navigator peer learning. A stepped-wedge hybrid type I (n=536 post implementation, n=564 historical controls) effectiveness-implementation study design was launched in June 2018, with 6 sites entering intervention phase by December 2019. Primary clinical outcomes are time to first treatment and receipt of guideline concordant care. Secondary implementation outcomes are acceptability, adoption, cost, fidelity, penetration, and sustainability. To date, we have 59 women on study in the intervention phase. We are reaching our target population: 39% of women are Black, 32% of Hispanic ethnicity, 47% are non-English speaking and 81% have Medicaid. Lessons learned with implementing a community-engaged, regional pragmatic trial include: 1) Patient Navigators are eager to collaborate in the care of their patients and to identify best practices; 2) Engaging all stakeholders, including hospital administrators, is necessary to implement health systems programs; 3) Workflow variation across each health system requires significant customization to adapt the evidence and tools; 4) Tension for change exists among all sites because of existing established care coordination programs; and 5) Lack of integration of EHRs within and across health systems makes use of new data platforms challenging. Regional, community-engaged, interdisciplinary collaborations are important to reduce population disparities than often transcend a single institution. TRIP outlines a coordinated model to address disparities in breast cancer care that could be translated to other regions and disease conditions.

B056 Assessing knowledge of genetic testing for inherited cancer among registry-based young black breast cancer survivors and predominantly non-Hispanic white clinic-

based patients. Sydney Cadiz¹, Sonya Reid², Brenda Zuniga², Ann Tezak², Anne Weidner², Tuya Pal². ¹Meharry Medical College, Nashville, TN, USA, ²Vanderbilt University Medical Center, Nashville, TN, USA.

Introduction: Practice guidelines put forth through the American Society of Clinical Oncology (ASCO) evolved to encompass a new method of testing whereby multiple genes are tested in parallel (i.e., multi-gene panel testing) and racial disparities in genetic testing rates persist. To measure and compare knowledge of inherited cancer predisposition and multi-gene panel testing across racially diverse patient groups, we administered a newly developed and validated knowledge scale aligned with the 2016 ASCO guidelines. Methods: Online survey data inclusive of 14 knowledge questions was collected among Black women diagnosed with breast cancer at or below age 50 recruited through the Tennessee and Florida state cancer registries ("Registry group"; N=39) and an insured, predominately non-Hispanic White patient population referred for cancer genetic risk assessment at the Vanderbilt Hereditary Cancer Clinic ("Clinic group"; N= 55). Demographic and clinical information were compared using Chi-Square and Fisher's Exact tests. Mean knowledge scores were calculated and compared using multiple regression analysis. Results: Rates of cancer among the Registry and Clinic groups were 100% and 49% (p<.0001), and rates of previous genetic testing were 69% and 13% (p<.0001). Mean knowledge scores were 6.10 and 6.75. When controlling for race, cancer history, and previous genetic testing, knowledge was not significantly different between the two groups (p=0.507). The lowest scoring knowledge questions among the Registry and Clinic groups included: 1) understanding of a variant of uncertain significance (15% and 11%); 2) knowledge of impact of genetic test results on supplemental insurance (21% and 11%); and 3) the types of possible test results (15% and 18%). Conclusion: These findings demonstrate similar knowledge of inherited cancer predisposition between a predominantly non-Hispanic White clinic-based population and a registry-based population of young Black breast cancer survivors; however, additional analyses should be performed as sample size increases. Knowledge about the possible results of genetic testing and the lack of protection against discrimination by supplemental insurers (e.g., life and disability insurance) was low across both groups; thus, should be a focus for improvement given that it could have real-world implications for decision-making. It remains important to assess knowledge of inherited cancer across diverse patient groups to develop effective strategies and interventions to increase knowledge across populations, including those with recognized disparities.

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B057 Promoting genetic counseling among African American women with hereditary risk for breast cancer. Vida Henderson¹, Delawnia Comer-Hagans², Vickii Coffey³, Giesela Grumbach³, Jennifer Newsome¹, Kent Hoskins¹. ¹University of Illinois Cancer Center, Chicago, IL, USA, ²Governors State University, Chicago, IL, USA, ³Governors State University, Chicago, USA.

Background: Breast cancer mortality is substantially higher in the U.S. for African American (AA) women compared to their white counterparts. Increasing the uptake of genetic counseling among AA women identified with increased breast cancer risk in Federally Qualified Health Centers (FQHC) is a key step in developing a successful approach to breast cancer disparities. However, studies show that women of color are less likely to receive genetic counseling for breast cancer risk. Our research group developed a multimedia culturally tailored educational video, informed by multiple qualitative methods, to improve uptake of genetic counseling among underserved AA women with increased breast cancer risk. We are conducting a pilot study to demonstrate the feasibility of incorporating the intervention with cancer genetic risk assessment in a mammography clinic. Methods: AA women will be recruited at the University of Illinois Mammography Center. Per current standard of care, all women who present for a mammogram complete a cancer genetic risk assessment (CGRA) as part of clinic intake. Women recommended for genetic counseling by the assessment tool will be invited to participate in this study. Participation includes: a pre-survey, viewing the educational video, and a post-survey. Pre- and post survey questions will capture data on the following constructs: knowledge, attitudes, normative beliefs, motivation, perceived social norms, intention to engage in genetic counseling, efficacy beliefs, skills, environmental constraints and opinions on video. Genetic counseling attendance will be monitored via electronic medical record. Thirty participants will be enrolled. Results: Preliminary results will be presented at the meeting. Conclusion: Culturally tailored health communication tools have shown to increase positive health behaviors. It is expected that the culturally tailored educational intervention will increase knowledge, motivation and intention to attend genetic counseling.

B058 Germline mutation spectrum in hereditary cancer syndromes in a Latin American population. María Carolina Sanabria-Salas, Gonzalo Guevara, Ana Lucía Rivera, Antonio Huertas, Vilma Medina, Lina María Trujillo, Esperanza Peña, Carolina Wiesner. Instituto Nacional de Cancerología, Bogotá, Colombia.

Introduction: Only 4% of the submissions to CLINVAR are from Latin American countries, similarly to Latino/Hispanic representation in other population genetic databases. We don't know the spectrum of mutations affecting Colombian families with hereditary cancer syndromes; moreover, these cases are under diagnosed in our Country. We aimed to identify germline risk mutations in patients with a suspected hereditary cancer syndrome who were referred for genetic counseling at the largest cancer reference Institution in Colombia (INC-E.S.E.). Materials and methods: Descriptive cohort of patients referred to genetic counseling within the Hereditary Cancer Program at the INC-E.S.E. Germline genetic studies were performed on 147 individuals through NGS multi-gene panels and confirmed with Sanger sequencing or MLPA. Genetic results from more patients will be added to these statistics as those are being analyzed. Results: So far, results were obtained from 90 patients with a foreign company to study 83 genes, and 57 additional patients were studied at the INC-E.S.E., with a panel of 105 genes from Illumina in a MiSeq. Two bioinformatic pipelines (Illumina Variant Interpreter and SOPHIA Genetics) were used. Single Nucleotide Variants (SNVs), small insertions and deletions (INDELs), and Copy Number Variants (CNVs), were classified according to the ACMG criteria. Likely pathogenic or pathogenic mutations were identified in 22% of the patients (32/147). Of the total number of patients with an identified hereditary breast cancer syndrome (11/147, 7.48%), 6 are carriers of homologous repair genes mutation (3 in *BRCA1*, 1 in *PALB2*, 1 in *CHEK2* and 1 in *RAD51D*); in *BRCA1*, one corresponds to the Colombian founder mutation A1708E and two carry the mutation *BRCA1*: c.1674delA (p.Gly559Valfs). The second most frequent was Lynch syndrome (8/147, 5.44%), 4 carry mutations in *MLH1*, 2 in *PMS2*, 1 in *MSH6* and 1 in *MSH2*. It is interesting that 3/4 patients with mutations in *MLH1* had the same splicing alteration (*MLH1* c.790 + 1G>A). Other 5 patients with a hereditary cancer syndrome were identified, including one of each: Li-Fraumeni, Multiple Endocrine Neoplasia type 1, Von Hippel Lindau, Neurofibromatosis 1 and *MUTYH* - Associated Polyposis (carrier of the two most frequent mutations in *MUTYH*: c.1187G>A & c.536A>G). Variants of Uncertain Significance (VUSs) were found in 47.62% and negative results in 32.65%. Conclusions: The finding of pathogenic mutations in 22% of this cohort is similar to what was previously reported for Colombia, but the percentage of VUSs is higher than other reports. Our lack of knowledge of the mutational spectrum in Colombians and our use of extensive multigene panels can explain this VUSs high rate.

B059 Can health system engagement facilitate greater utilization of genetic tests to predict cancer risk? A health disparities exploration of national survey data. Jason T

Semprini, Olufunmilayo Olopade. University of Chicago, Chicago, IL, USA.

Funding: Susan G. Komen® GTDR16376189 Objective: To estimate the effect health system engagement on a woman's awareness of and decision to complete a genetic test to predict cancer risk. Background: Young African American women face a higher risk of breast cancer mortality than white women. To mitigate this disparity, clinicians have developed predictive risk assessment and stratified screening protocols based on genetic tests. However, African American women have historically been under represented in genetic test utilization. If the trend of low genetic test participation continues, potential health gains from precision medicine will be limited or unrealized, further expanding the Black/White breast cancer mortality disparity. Significance: While previous investigators have made numerous attempts to better understand the Black/White disparity in genetic testing, this study directly analyzes racial disparities in genetic test exposure and utilization through health system engagement using the latest population-level survey dataset. Methods: Data was obtained from the nationally representative, cross-sectional National Health Interview Surveys for years 2000, 2005, 2010, and 2015. Outcomes included: 1) awareness of a genetic test; 2) genetic test utilization, conditional on awareness; 3) discussing a genetic test with a medical provider; and 4) unconditional genetic test utilization. Weighted odds ratios were calculated by a series of multivariate logistic regression models. Independent variables included various socioeconomic and demographic indicators, as well as health system factors. Results: White women with a usual place of medical care held significantly higher odds of genetic test awareness and of discussing a genetic test with a medical provider (OR = 2.16, $p < .001$; OR = 5.34, $p < .05$). Conversely, a usual place of medical care was not found to heighten awareness or facilitate greater discussion with a medical provider for African American women. Consistent with this trend, only among white women did a consistent place of medical care yield a positive effect on genetic test utilization (OR = 2.53, $p < .001$). No such protective factor existed for black women at a significant level. Conclusion: There still exists a stark disparity in genetic test awareness and utilization between black and white women. But this study identified another disparity, that white women were more likely to discuss genetic tests with a medical provider than black women. These results support the idea that health system engagement promotes greater awareness of genetic tests to predict cancer risk. However, the limited impact a

usual place of medical care had on actual utilization warrants further exploration into the drivers of genetic test decision making both across and within racial groups. The continued commitment to addressing cancer disparities requires not only policy-makers and oncologists, but explicit engagement from genetic counselors and providers across the care continuum.

B061 Effect of artonin E on apoptosis cell death induction in colon cancer cell. Supichaya Nimnuan-

ngam¹, Kanyaluck Yangnok¹, Sukanda Innajak², Ramida Watanapokasin². ¹Department of Biology, Faculty of Science, Srinakharinwirot University, Bangkok, Thailand, ²Department of Biochemistry, Faculty of Medicine, Srinakharinwirot University, Bangkok, Thailand.

Colon cancer is the most common cause of cancer death in both men and women around the world. The three human RAS genes (KRAS, NRAS and HRAS) are the most frequently mutated oncogenes in human cancer including pancreatic, lung and colon cancers. In particular, KRAS mutated gene prevalently found in pancreas, lung and colon cancer [1]. In colorectal cancer patients, approximately 35-45% mutated KRAS oncogene was reported. The downstream of KRAS associated with survival signaling pathways including Raf/Mek/MAPK and PI3K/Akt [2]. Normally, cancer cell escape death induction by upregulation of Raf/Mek/MAPK and PI3K/Akt activity. Thus, inhibition of Raf/Mek/MAPK and PI3K/Akt signaling pathway is necessary. Nowadays, treatment of colon cancer is quite limited due to the high cost and side effects, therefore, bioactive compound therapy might be the choice for development of colon cancer treatment. In this study, we investigate the effect of artonin E on apoptosis induction in colon cancer HCT116 cells. Nuclear morphological changes and the loss of mitochondrial membrane potential, characteristics of apoptosis induction were determined by Hoechst 33342 staining and JC-1 staining, respectively. Mediator proteins that associated with apoptosis induction and signaling molecules were determined by Western blot analysis. Our results indicated that artonin E induced apoptotic bodies and loss of mitochondrial membrane potential in HCT116 treated cells. In addition, artonin E showed upregulation of cleave-caspase-7 (active form) and cleave-PARP (inactive form), mediator of apoptosis induction, in HCT116 cells. Moreover, artonin E reduced Akt and increased p-ERK1/2 expression in HCT116 cells. This data correlated with previous study by Tangchirakaphan et al and Bee-Jen Tan et al, that ERK1/2 could activate caspase and pro-apoptotic protein in Bcl-2 family. Moreover, ERK1/2 could deactivate Akt signaling pathway leading to apoptosis

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induction [3,4]. Our study indicated that artonin E induced apoptosis cell death through p-ERK1/2 upregulation and may be used as a potential therapeutic candidate in the future. Keywords: Artonin E, Apoptosis, Colon cancer, KRAS [1] Cox AD, Fesik SW, Kimmelman AC, Luo J, Der CJ. Drugging the undruggable RAS: Mission possible? *Nat Rev Drug Discov*. 2014;13(11):828-51. [2] Eser S, Schnieke A, Schneider G, Saur D. Oncogenic KRAS signalling in pancreatic cancer. *Br J Cancer*. 2014;111(5):817-22. [3] Tangchirakhaphan S, Innajak S, Nilwarangkoon S, Tanjapatkul N, Mahabusrakum W, Watanapokasin R. Mechanism of apoptosis induction associated with ERK1/2 upregulation via goniothalamin in melanoma cells. *Exp Ther Med*. 2018;15(3):3052-8. [4] Tan BJ, Chiu GN. Role of oxidative stress, endoplasmic reticulum stress and ERK activation in triptolide-induced apoptosis. *Int J Oncol*. 2013;42(5):1605-12.

B062 Kaiso influences immune signaling of breast cancer exosomes. [Shakir U Ahmed](#)¹, Brittany Davis², Benjamin Adu Addai³, Balasubramanyam Karanam⁴, Melissa Davis², William Grizzle⁵, Honghe Wang⁴, Clayton C Yates⁴. ¹Integrative Biosciences PhD Program, Tuskegee University, Tuskegee AL, USA, ²Department of Biology and Center for Cancer Research, Tuskegee University, Tuskegee AL, USA, & Bangladesh Council of Scientific and Industrial Research, Dhaka, Bangladesh, Tuskegee, AL, USA, ²Henry Ford Health System, Public Health Sciences Detroit, MI, USA, ³School of Veterinary Medicine, Tuskegee University, Tuskegee, AL, USA, ⁴Department of Biology and Center for Cancer Research, Tuskegee University, Tuskegee, AL, USA, ⁵University of Alabama at Birmingham, Birmingham, AL, USA.

Introduction: Exosomes are communication vesicles act as mediator of intracellular transfer of genetic information, act an important role in intercommunication between tumor cells and immune cells. However, the mechanism underlining this cell-cell communication is not well understanding, particularly in African American breast cancer patients. Recently, our lab has demonstrated that Kaiso, a novel bi-modal transcription factor is highly expressed in African American breast cancer and notably, high Kaiso expression correlates with breast cancer aggressiveness and the disparity in survival outcomes of breast cancer patients of African American compared to European American patients. However, the differential expression and biological consequences of Kaiso in immune signaling of breast cancer exosomes has not been studied yet. Herein we demonstrate the biological role of Kaiso in immune signaling in breast cancer exosomes. Methods: In this study we utilized Nanostring immune profiling

technology along with multiple in vitro and in vivo assays were used to study the role of Kaiso in breast cancer immune escape. Results: Nanostring pan cancer immune profiling demonstrated that European American breast cancer exosomes exhibited higher expression of TILs markers, T cell activation markers and CD8+T Cells markers compared to African American, while we observed an increase in the expression of the anti-phagocytic molecule CD47 in breast cancer patient exosomes of African American compared to European American patients. In addition to that CD47 and SIRP- α (Signal Regulatory Protein) are highly expressed in Kaiso-scrambled MDA-MB-231 cells (sh-Scr) and exosomes, whereas THBS1, which is a regulator of CD47 expression and is regarded as angiogenesis inhibitor is significantly increased in sh-Kaiso MDA-231 cells and exosomes. Additionally, we observed that Kaiso directly binds methylated sequences in the promoter region of CD47 and THBS1 by ChIP assay. Furthermore, in vivo sh-Kaiso cells injected into athymic mice exhibited delayed tumor formation after four weeks with smaller tumor size as compared to sh-SCR cells, and we observed higher expression of THBS1 with lower expression of CD47 and SIRP- α molecules by IHC and exosomes isolated from in vivo tumors, indicating that Kaiso is associated with macrophage mediated immune escape. Conclusion: These findings demonstrate the important role of kaiso in immune signaling through exosomes which may be related with more aggressive cancer phenotype in breast cancer specially in African Americans.

B063 Race-related LMO7 exon skipping enhances prostate tumor invasion. [Muthana Al Abo](#)¹, Alice Jiang¹, Daniel J George¹, Zefeng Wang², Steven R Patierno¹, Jennifer A Freedman¹. ¹Duke University, Durham, NC, USA, ²University of North Carolina, Chapel Hill, NC, USA.

Prostate cancer (PCa) affects disproportionately African American (AA) men in comparison with white or Asian men. According to the Surveillance, Epidemiology, and End Results Program (SEER), the mortality from PCa in black men is 2-5 times higher than in white or Asian men. In addition to differences in social determinants of health, differences in biological mechanisms contribute to the PCa disparity. We reported previously results from a comparative analysis of the transcriptomes of PCa specimens from 20 AA and 15 white patients, identifying 1,188 differentially expressed genes. In addition to the race-related aggregate gene expression differences, we also identified 2,520 differential RNA splicing events between these tumor specimens from AA and white patients. Among the 2,520 events, we prioritized 25 events, which had also been reported by Tsai

et. al., 2015 to be differentially expressed between tumor and normal breast, lung and liver samples in The Cancer Genome Atlas (TCGA). To elucidate the function of these 25 events, we used Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)-CRISPR associated protein 9 (Cas9) methodology to generate PCa cells expressing each of the race-related alternative RNA splice variants. To date, we have generated DU145 PCa cells that express the following exon skipping events: *LIM Domain 7 (LMO7) exon 12*, *Integrin Subunit Alpha 6 (ITGA6) exon 27* and *Actin Binding LIM Protein Family Member 3 (ABLIM3) exon 14*. The genotype of these cells was confirmed by PCR. Preliminary proliferation analysis demonstrated that skipping of *ITGA6* exon 27 slowed doubling time of the cells compared with the parental cells. Interestingly, the cells expressing the *LMO7* exon 12 skip appear more mesenchymal-like. Preliminary invasion analysis suggests that *LMO7* exon 12 skipping increases (~ 4 times) the ability of the cells to pass through a Matrigel matrix, suggesting an increased invasive and metastatic potential of these cells. In conclusion, we have identified race-related RNA splicing events in PCa that function in processes relevant to oncogenesis. Further analysis of the biological significance of these race-related RNA splicing events in vitro and in vivo is underway. Our approach to analyze RNA splicing in the context of PCa disparity has the potential to uncover novel biological mechanisms underlying this disparity and to discover novel therapeutic targets.

B064 Race-related genetic variation and response to secondary hormonal therapy in metastatic castration-resistant prostate cancer. Tyler A Allen, Gary Lipton, Alexander B Sibley, Patrick Healy, Brendon M Patierno, Bonnie Lacroix, Steven R Patierno, Kouros Owzar, Terry Hyslop, Daniel J George, Jennifer A Freedman. Duke University, Durham, NC, USA.

Prostate cancer (PCa) is the most prevalent cancer and third leading cause of cancer death among men in the United States. PCa incidence, aggressiveness and mortality are significantly higher among African Americans (AAs) compared with men of other racial groups. Despite the worse prognosis associated with African ancestry, several recent studies have shown that PCa patients of African ancestry have a better response to certain PCa therapeutic regimens than those of European ancestry. The overall objective of our study is to identify ancestry-related genetic variation that associates with outcomes on abiraterone/prednisone therapy in metastatic castration-resistant prostate cancer (mCRPC). Our central hypothesis is that differences in ancestry-related single nucleotide polymorphisms (SNPs), gene expression and/or

metabolites will associate with prostate-specific antigen (PSA) response and time to progression on secondary hormonal therapy in mCRPC patients. Toward our objective, we collected whole blood, archival tumor tissue and serum from 50 self-identified AA and 50 self-identified white patients enrolled in the Abi Race study, a Phase II study of abiraterone/prednisone in AA and white men with mCRPC. To perform ancestral and genome-wide genotyping, we isolated DNA from the whole blood samples collected at baseline and interrogated DNA using the Infinium Multi-Ethnic Global BeadChip (Illumina). Preliminary analysis identified 622 SNPs that associated with PSA progression-free survival on abiraterone or variation in minor allele frequency by ancestry. To perform gene expression profiling, we isolated RNA from archival formalin-fixed, paraffin-embedded PCa tissue and interrogated RNA using a NanoString Custom CodeSet (NanoString Technologies). Preliminary analysis revealed significant race-related differential expression of 30 prostate cancer-related genes. To perform metabolomic profiling, we used fasting serum samples collected at baseline and during treatment and the Biocrates p400 HR Kit (Biocrates Life Sciences AG). From this analysis, we have prioritized four ancestry-related metabolites associated with time to confirmed PSA progression for further study. Future analyses will focus on defining the functional significance of the aforementioned ancestry-related genetic variation using preclinical cancer models and validation of the aforementioned ancestry-related genetic variation in an independent cohort. These findings will further understanding of ancestry-related biological factors that influence response to secondary hormonal therapy in mCRPC and could have direct implications for the timing and selection of AA patients for secondary hormonal therapy and those needing additional therapy. As secondary hormonal therapy use expands to earlier disease settings, these findings could support the need for further studies in AA men in these disease settings. Ultimately, such strategies have the potential to mitigate PCa disparity.

B065 A framework for transcriptome-wide association studies in breast cancer in diverse study populations. Arjun Bhattacharya¹, Montserrat Garcia-Closas², Andrew F. Olshan³, Charles M. Perou⁴, Melissa A. Troester⁵, Michael I Love⁶. ¹Department of Biostatistics, University of North Carolina-Chapel Hill, Chapel Hill, NC, USA, ²Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda, MD, USA, ³Department of Epidemiology and Lineberger Comprehensive Cancer Center, University of North Carolina-Chapel Hill, Chapel Hill, NC, USA, ⁴Lineberger Comprehensive Cancer Center and Department of Genetics and Department of Pathology and Laboratory Medicine, University of North Carolina-Chapel Hill, Chapel Hill, NC,

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The relationship between germline genetic variation and breast cancer survival is largely unknown, especially in understudied minority populations. Traditional genome-wide association studies (GWAS) have interrogated survival associations in cohorts of predominantly European ancestries but are often underpowered due to subtype heterogeneity in breast cancer and a wide range of clinical covariates. Furthermore, these analyses tend to detect loci in non-coding regions, which require follow-up functional studies to interpret. Recent work in transcriptome-wide association studies (TWAS) has shown increased power in detecting functionally-relevant, trait-associated loci by leveraging information from expression quantitative trait loci (eQTLs) in external reference panels in relevant tissues. However, race-specific reference panels for TWAS may be needed to draw correct inference in large, ethnically-heterogeneous cohorts, and such panels for breast cancer are lacking.

In this work, we provide a framework for TWAS for breast cancer in diverse populations, using data from the Carolina Breast Cancer Study (CBCS), a population-based cohort that oversampled for women self-identifying as African American. Using Nanostring expression data from CBCS, we perform an eQTL analysis for 417 breast cancer-related genes to train race-stratified predictive models of tumor expression from germline genotypes. We use these models to impute expression in held-out samples from the CBCS and in The Cancer Genome Atlas, using a permutation method to assess predictive performance accounting for sampling variability. We find that these race-stratified expression models are not always applicable across race, depending on the imputation cohort. Furthermore, their predictive performance varies by breast cancer subtypes. Lastly, we conduct a small-scale TWAS for breast cancer mortality in CBCS ($N = 3,828$), controlling for covariates used in previous GWAS for breast cancer survival. At an false discovery rate-adjusted P -value less than 0.1, adjusting for self-reported race, we find hazardous associations near *CAPN13* ($2p23.1$), *VAV3* ($1p13.3$), and *BLK* ($8p23.1$) and a protective association near *SERPINB5* ($18q21.33$) in TWAS that are underpowered in GWAS. This approach shows increased power for detection of survival-associated genomic loci, demonstrating the relative strength of TWAS over GWAS.

A carefully implemented TWAS is an efficient alternative to GWAS for understanding the genetic architecture

underpinning breast cancer outcomes in diverse human populations and across biologically distinct tumor types.

B066 Breast and prostate cancers harbor common somatic copy number alterations that consistently differ by race and are associated with survival. Yalei Chen¹, Sudha M Sadasivan¹, Ruicong She¹, Indrani Datta¹, Kanika Taneja¹, Chitale Dhananjay¹, Nilesh Gupta¹, Melissa B Davis², Lisa A Newman², Craig G Rogers¹, Pamela L Paris³, Jia Li¹, Benjamin A Rybicki¹, Albert M Levin¹. ¹Henry Ford Health System, Detroit, MI, USA, ²Weill Cornell Medicine, NY, NY, USA, ³University of California, San Francisco, San Francisco, CA, USA.

African Americans (AAs) tend to have more aggressive diseases and worse outcomes for many cancer types compared to European Americans (EAs). Large structural changes on chromosomes, such as somatic copy number alterations (SCNAs), are commonly present in many cancers and associated with clinical outcomes. While studies focusing on single tumor types have identified racial differences in SCNA frequencies and their possible association with cancer outcomes, pan-cancer race-differentiated SCNAs and their clinical implications have not been fully explored. Focusing on two of the most common hormonally driven cancers, breast cancer in women and prostate cancer in men, and using data from The Cancer Genome Atlas (TCGA), we first identified recurrent SCNAs using GISTIC2 in AAs and EAs separately within each cancer. For each GISTIC2 identified SCNA region, we calculated the magnitude deviation from the expected null value (i.e. copy number (CN) = 2) using the area under the $\log_2(\text{CN})$ (cnAUC) for each tumor. Modeling cnAUC as the outcome variable, we identified SCNAs that differed between AAs and EAs in breast cancers ($n=58$ SCNAs; permutation $p < 10^{-4}$) and prostate cancers ($n=78$ SCNAs; permutation $p=0.006$). Six of nine race-differentiated SCNAs common to breast and prostate cancers had consistent magnitude differences by race across both tumor types, and all six were of higher magnitude in AAs. These six race-differentiated SCNAs were found at chromosomes 5q11.2-q14.1, 5q15-q21.1, 8q21.11-q21.13, 8q21.3-q24.3, 11q22.3, and 13q12.3-q21.3 with the chromosome 8q regions being the only amplifications. Unsupervised hierarchical clustering of the SCNAs in these six race-differentiated regions identified three patient groups in each tumor type with significant survival differences. Of particular importance, within triple negative breast cancers, these SCNA patient groups showed the most significant difference in progression-free survival ($p=0.019$). While there was a higher frequency of AAs among the SCNA-defined patient groups with worse survival, no significant racial difference in survival was observed within

each SCNA-defined patient group. This observation supports the idea that racial disparities in breast and prostate cancer outcomes might be in part due to racial differences in tumor biology that drive structural chromosomal changes shared across these common tumor types. Our ability to derive SCNA defined patient groups associated with survival based on race-differentiated genomic aberrations demonstrates both their clinical relevance and the need to understand the biologic mechanisms that give rise to them.

B067 Whole-exome sequencing of matched longitudinal primary and metastatic prostate cancers from African

American men. Zarko Manojlovic¹, Babak Shokrani², John D Carpten¹, [Mezbah U Faruque](#)². ¹Keck School of Medicine of the University of Southern California, Los Angeles, California, USA, ²Howard University College of Medicine, Washington, DC, USA.

The incidence and associated mortality and morbidity from prostate cancer (PCa) are disproportionately higher among African Americans (AA). Most deaths from PCa are attributable to the metastatic phase of the disease; the molecular underpinnings of which remain poorly understood. To identify somatic genomic variations associated with PCa metastases, we performed whole-exome sequencing (WES) on matched normal, primary, and metastatic prostate cancer tissue trios from AA patients. Microdissected formalin fixed paraffin embedded archival tissue was the source of the samples. The analysis to identify significant driver mutations and somatic copy number events was deduced using publicly available tools and custom bioinformatics processes. The cohort was comprised of matched tissue trios from 18 AA prostate cancer cases. Mean WES coverage for normal, primary and metastatic tumor were 79X, 76X and 72.5X, respectively. Percent African ancestry ranged from 0.755 to 0.997 based upon admixture informative markers from WES data. Somatic mutation counts varied among individual primary (26 to 1,457) and metastatic (22 to 323) tumors. The extent of mutation overlaps between primary and metastatic PCa genomes varied substantially from 0 (0%) to 53 (14%). Recurrent mutations in the *TECPR2* and *PARP4* genes were found unique to metastatic cancers. Three missense mutations in the *TECPR2* gene were found in the metastatic lesions of three individual patients: G344R (novel), S514N (novel) and R1066C (rs776056002). *In silico* functional annotation of these mutations showed to have a potentially deleterious (SIFT) and possibly/probably damaging (PolyPhen) effect. Two potentially deleterious missense mutations in the *PARP4* gene namely E216V (novel) and L1080F (rs201405094) were found in the metastatic lesions

in two patients. We observed differentially altered copy number events between primary and metastatic tumors. Significantly higher recurrent amplifications of chromosomal regions harboring *JAK3* and *ANK2* genes were observed in 26% of metastatic cases ($p < 0.05$). Copy number losses ($p < 0.05$) specific to metastatic tumors included regions harboring *TPO*, *AFF3*, and *CYP7B1* genes. Here we report identification of recurrent potentially deleterious missense mutations in the *TECPR2* and *PARP4* genes in a subset of metastatic PCa that were not present in matched primary tumors. Several copy number alterations including amplifications of the *JAK3* and *ANK2* genes were also found unique to metastases. Further examination of the biological role of the identified novel mutations in the etiopathogenesis of PCa metastases is warranted, and is currently underway.

B068 Whole-exome sequencing reveals rare and novel variants associated with breast cancer in Trinidadian

families. Alana Clare, [Rajini Haraksingh](#). The University of the West Indies, St. Augustine, Trinidad & Tobago.

Breast Cancer is the most prevalent cancer that affects women both worldwide and in Trinidad & Tobago. According to the World Health Organization it accounts for 22.1% of all cancer mortality cases as of 2014. This study aims to determine whether there are novel genetic contributors to the development of Breast Cancer in Trinidadian individuals. Approximately 30 genes contributing to Breast Cancer susceptibility have been discovered largely through studies done on Caucasian populations. However, the extent to which these genetic contributors are relevant in Caribbean populations is unknown. The Trinidadian population is highly ethnically diverse with a significant African and South Asian admixed population. 90 Breast Cancer patients in Trinidad have undergone genetic screening for common cancer-causing mutations using the Color Genomics Hereditary Cancer Test. This panel covers 30 genes and approximately 78% of these patients were found to be negative for known mutations in these genes. As such, we hypothesize that there may be novel genetic variants present in this population that are the potential cause of some hereditary Breast Cancer cases. We performed Whole Exome Sequencing of two members of such a family with evidence of hereditary Breast Cancer. Subsequent bioinformatics analysis revealed potential novel and understudied genetic variants associated with the Breast Cancer condition in this family. This study demonstrates the importance of inclusion of understudied populations in medical research and reveals novel molecular points of entry for developing new Breast Cancer diagnostics and therapeutics for this population.

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B069 Upregulation of miR-130b contributes to risk of poor prognosis and racial disparity in African-American prostate cancer. Yutaka Hashimoto, Marisa Shiina, Yuichiro Tanaka, Rajvir Dahiya, Shahana Majid. NCIRE/UCSF, San Francisco, CA, USA.

Prostate cancer (PC) incidence and mortality rates are higher in African-American (AA) than in European-American (EA) men. The main objective of this study was to elucidate the role of miR-130b as a contributor to PC health disparity in AA patients. We also determined whether miR-130b is a prognostic biomarker and a new therapeutic candidate for AA PC. A comprehensive approach of using cell lines, tissue samples and the TCGA database was employed. We performed a series of functional assays such as cell proliferation, migration, invasion, RT2-PCR-array, qRT-PCR, cell cycle, luciferase reporter, immunoblot and immunohistochemistry. Various statistical approaches such as Kaplan-Meier, Uni- and Multivariate analyses were utilized to determine the clinical significance of miR-130b. Our results showed that elevated levels of miR-130b correlated with race disparity and PSA levels/failure and acted as an independent prognostic biomarker for AA patients. Two tumor suppressor genes, CDKN1B and FHIT, were validated as direct functional targets of miR-130b. We also found race-specific cell cycle pathway activation in AA PC patients. Functionally, miR-130b inhibition reduced cell proliferation, colony formation, migration/invasion and induced cell cycle arrest. Inhibition of miR-130b modulated critical PC related biological pathways in AA compared to EA PC patients. In conclusion, attenuation of miR-130b expression has tumor suppressor effects in AA PC. miR-130b is a significant contributor to PC racial disparity as its overexpression is a risk factor for poor prognosis in AA PC patients. Thus, regulation of miR-130b may provide a novel therapeutic approach for the management of PC in AA patients.

B070 Mitotic kinases differentially phosphorylate survivin in African American TNBC: Clues for racial disparity. Shriya Joshi¹, Chakravarthy Garlapati², Luciane Cavalli³, Uma Krishnamurti⁴, Shobhna Kapoor⁵, Ritu Aneja¹. ¹Department of biology, Georgia state university, Atlanta, Georgia, USA, ²Department of biology, Georgia state university, Atlanta, Georgia, USA, ³Research Institute Pelé Pequeno Príncipe, Curitiba, PR, Brazil, ⁴Department of Pathology, Emory University School of Medicine, Atlanta, Georgia, USA, ⁵Department of Chemistry, Indian Institute of Technology Bombay, Mumbai, Maharashtra, India.

Protein diversity arising from alternative mRNA splicing or post-translational modifications (PTM) such as

phosphorylation, methylation etc. plays a vital role in the modulation of cellular functions. Mitotic kinases such as polo-like kinase 1 (PLK1) and aurora B (AURKB) are known to phosphorylate survivin, an inhibitor of apoptosis family member, to promote cell survival and proliferation. This triad is significantly overexpressed in triple negative breast cancer (TNBC), an aggressive breast cancer (BC) subtype, associated with high proliferative capacity, propensity for distant metastasis and chemotherapeutic resistance. TNBC disproportionately afflicts African-American (AA) women relative to European-American (EA) women. AAs demonstrate a much more aggressive disease course compared to EAs. Thus far, efforts to examine molecular underpinnings of racial disparity in TNBC have largely focused on differences in gene expression and epigenetic aspects. Herein, we demonstrate the role of survivin phosphorylation, an important PTM, in enhancing cell proliferation and reducing apoptosis in AA compared to EA TNBC cells. Using the TCGA breast cancer dataset, our *in silico* analysis of various mitotic kinases yielded a significantly higher gene expression of PLK1 ($p=0.061$) and AURKB ($p=0.003$) in AA ($n=41$) compared to EA TNBC ($n=86$) patients. Surprisingly, we found no race-related differences in survivin gene expression in this dataset ($n=127$, $p=0.343$). In addition, there was no statistical difference in protein levels of survivin in TNBC clinical samples ($n=142$, $p=0.45$) as measured immunohistochemically. These findings led us to rationalize that the differential activation of survivin in AA vs. EA TNBC cells is based on PTM, and not due to its differential gene/protein expression levels. We hypothesize that differential phosphorylation of survivin by mitotic kinases underlies enhanced proliferative and anti-apoptotic activity in AA relative to EA TNBC. Survivin phosphorylation at Ser-20 and Thr-117 is known to regulate the activity of the chromosome passenger complex facilitating mitosis and cell proliferation. Moreover, p-survivin Thr-117 inhibits X-linked inhibitor of apoptosis-Smac interaction, which in turn prevents caspase-9 activation, leading to anti-apoptosis. We observed an upregulation of phosphorylated substrates of PLK1 and AURKB viz. p-survivin Ser-20 & p-survivin Thr-117, respectively, in AA compared to EA TNBC cells. Survivin ablation significantly attenuated cell proliferation, cell cycle progression, and increased cell apoptosis in AA compared to EA TNBC cells. These data strongly support our premise that higher survivin phosphorylation confers enhanced proliferative capacity and anti-apoptosis in AA compared to EA TNBC cells, suggesting that modulating survivin PTM may be a viable therapeutic strategy for AA TNBC patients. Further studies intended to tease out the role of survivin phosphorylation in TNBC racial disparity are currently underway in our lab.

B071 PVT1 regulation of claudin expression in triple-negative breast cancer.

Fayola Levine¹, Olorunseun Ogunwobi². ¹City University of New York, Hunter College, New York, NY, USA ²Hunter College Center for Cancer Health Disparities Research, New York, NY, U.S.A.

Breast cancer (BC) is a heterogeneous disease that is classically driven by the estrogen receptor (ER), progesterone receptor (PR) and human epithelial growth factor receptor 2 (EGFR2/HER2) signaling pathways. Triple negative breast cancer (TNBC), is a lethal subtype of invasive BC tumors that are ER-, PR- and HER2-. A subtype of TNBC is claudin low (CL). Dysregulation of claudin proteins disrupts tight junctions, consequently inducing the epithelial-to-mesenchymal transition (EMT) in cancers. This leads to enhanced motility and metastasis. Patients with CL TNBC have worse prognosis than patients with other BC subtypes. African American (AA) women with TNBC account for almost 20% of all BC cases and premenopausal African American (AA) women are more likely to die from the disease. PVT1 is a long noncoding RNA (lncRNA) transcribed from the 8q24 genomic locus that has been implicated in multiple cancers including BC. Amplification of the 8q24 gene locus is a common event in many malignant diseases and is associated with poor survival rate among patients. Although previous research demonstrates a critical functional role which PVT1 plays in BC, the underlying molecular mechanisms of PVT1 in CL TNBC was previously unknown. We assessed PVT1 expression in BC, and we observed that PVT1 exons 4A, 4B, and 9 are significantly upregulated in MDA MB 231 cells (claudin low) and significantly downregulated in MDA MB 468 cells (claudin high), in comparison to T47D (ER+). We have confirmed that claudin expression, specifically claudins 1, 3, 4 and 7, are higher in MDA MB 468 and lower in MDA MB 231. When PVT1 exon 9 expression is silenced in the MDA MB 231 CL TNBC cell line, we observed a significant reduction in migration when compared to cells transfected with a control scramble siRNA, suggesting that PVT1 exon 9 may be regulating migration in CL TNBC. Further investigation could lead to an understanding of the molecular mechanisms by which PVT1 exon 9 regulates claudin expression and consequently clinical outcome in TNBC.

B072, PR02 Identification of mechanisms of resistance to enzalutamide treatment using in vitro castration-resistant prostate cancer models.

Joakin O Mori, Hui-Xian Lin, Jason White, Alahni Becks, Raven Williams, Clayton Yates, Honghe Wang. Tuskegee University, Tuskegee, Alabama, USA.

Prostate Cancer (PCa) disproportionately affect African American (AA) men. Compared to their European American

(EA) counterparts, AA men are at higher risk of developing PCa, and more likely to develop metastatic castration resistant PCa (mCRPC). Enzalutamide (ENZ), a second-generation anti-androgen for treatment of mCRPC prolongs survival of patients; however, its overall benefit is modest (4.8 months) and most patients relapse in less than two years. To date, the molecular mechanism underlying ENZ resistance has not been well illustrated. Identifying molecular pathways underlying hormone therapy resistance is critical for developing novel combinatorial therapies to inhibit resistance, prevent tumor recurrence, and extend patient survival. Presently, *in vitro* models commonly used for research on PCa are of EA origin. A primary versus mCRPC model specific to AAs was developed by subjecting primary prostate tumor cell lines (non CRPC/AA) – RC77T, RC43T, RC165T to invasion chamber and ENZ selection pressure. The resulting castration Resistant prostate tumor isogenic cell lines – RC77T-CR, RC43T-CR, RC165T-CR (CRPC/AA) were maintained in K-SFM containing 10 μ M MDV3100. The primary prostate tumor non CRPC/AA cell lines were epithelial in appearance, while the CRPC/AA lines appeared mesenchymal. To identify transcriptomic signatures associated with acquisition of ENZ resistance we profiled gene expression in ENZ-sensitive and -resistant mCRPC cells using RNA sequencing. Analysis revealed a panel of 352 genes differentially expressed between non CRPC/AA and CRPC/AA cells. Comparison of CRPC/AA and CRPC/EA cell lines (C4-2B, PC3 and DU-145) revealed 1005 DEGs; suggesting a substantial difference between EA and AA cell line models. Comparison between CRPC/AA and CRPC/EA identified 2802 DEGs, while up to 6104 DEGs were identified between EA and AA cells lines. Overlapping DEGs in the ENZ-sensitive and -resistant cells were ranked by Gene Set Enrichment Analysis (GSEA), which identified regulation of organelle organization, central nervous system development, regulation of hydrolase activity, cell proliferation and regulation of cytokine production as the top five biological pathways up-regulated by the DEGs. *LEF1*, *IGF2BP1* and *TBC1D3* were the three most common genes associated with upregulated biological processes. On the other hand, *KRT4*, *EDAR*, *GJA5* and *EDNA2* were the most common genes involved in down-regulated biological process. The present results showed that different genes are expressed between EA and AA cell lines in general and between CRPC/EA and CRPC/AA. These transcriptional changes have potential for further study as predictive biomarkers and as targets of mCRPC treatment. Our findings suggest that RNA alteration profiling can identify potential mechanisms of ENZ resistance that may not only contribute to the recurrence of CRPC, but also serve as new targets for CRPC therapy.

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B074 The long noncoding RNA from PVT1 exon 9 is overexpressed in prostate cancer in Black males and induces malignant transformation, invasiveness, and castration-resistance in prostate epithelial cells. [Gargi Pal](#)¹, Jeannette Huaman¹, Fayola Levine¹, Akintunde Orunmuyi², E. Oluwabunmi Olapade-Olaopa², Olorunseun O. Ogunwobi³. ¹Hunter College, CUNY, New York, NY, USA, ²University of Ibadan, Ibadan, Nigeria, ³Hunter College Center for Cancer Health Disparities Research (CCHDR), New York, NY, USA.

Prostate cancer (PCa) is the most common non-skin cancer and the second leading cause of cancer-related death for men in the United States. PCa is the greatest source of cancer-related mortality in males of African ancestry. One of the most important susceptibility loci for cancer is the 8q24 human chromosomal region. The non-protein coding gene locus plasmacytoma variant translocation 1 (PVT1) is located at 8q24 and is dysregulated in different cancers. PVT1 gives rise to several alternatively spliced transcripts and microRNAs. There are at least twelve exons of PVT1, which make separate transcripts, and likely have different functions. The transcript from PVT1 exon 9 is significantly overexpressed in PCa tissues in comparison to normal prostate tissues obtained from Black males. Both transient and stable overexpression of PVT1 exon 9 induce significantly increased prostate epithelial cell proliferation, migration, and proliferating cell nuclear antigen (PCNA) expression. Notably, implantation into mice of a novel subline of a non-tumorigenic prostate epithelial cell line stably overexpressing PVT1 exon 9 results in the formation of malignant tumors with features characteristic of aggressive PCa. Further, PVT1 exon 9 overexpression significantly induces castration-resistance in prostate epithelial cells. Consequently, PVT1 exon 9 expression is important for PCa initiation and progression and may have potential diagnostic and therapeutic applications in PCa in Black males.

B075 Defining germline mutations of DNA damage repair genes in African American prostate cancer patients.

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Background: DNA damage repair genes (DDRGs) play a critical role in protecting genome integrity and have been implicated in several cancer types. In the context of prostate cancer (CaP) emerging data provide potential role of this pathway in aggressive disease. It has also been recently demonstrated that PARP inhibitors can extend overall survival in metastatic patients with DDRG mutations. However, the association and therapeutic stratification based on inherited mutations of DDRGs remains to be defined in African American (AA) CaP patients.

Our objective was to assess the frequency and association with disease aggressiveness of all known DDRGs in blood derived genomic DNAs of AA and Caucasian American (CA) CaP patients archived at the DOD Center for Prostate Disease Research and assess how this information can refine patient stratification for specific targeted therapeutic options.

Method: Germline mutations in all DDRGs was evaluated by whole genome sequence (WGS) analysis of archived blood DNA samples from 600 CaP patients (300 AA and 300 CA) who underwent primary treatment at Walter Reed National Military Medical Center (WRNMMC) over the past 20 years. These patients had equal access Department of Defense healthcare system with up to 20 years of follow-up time.

Following quality control steps to assess DNA quantity by Qubit assay and DNA quality by Bioanalyzer assay, DNA samples were used to generate PCR-free libraries for WGS using the NovaSeq (Illumina) platform. Out of the 600 libraries we generated, 14 dropped out, achieving a success rate of 97.6%. The successful libraries had an excellent quality based on DNA library metrics (yield and fragment length). Whole genome sequencing depth of the samples exceeded 37x on average and about 4 million SNPs were identified in the samples.

Patient genotypes were projected onto principal components from reference populations. Sample ancestries were predicted by using the “Peddy” program, which uses a machine learning model trained on individuals of diverse ancestries from the 1000 Genomes Project reference panel. Due to mismatched ancestry, 33 samples were excluded from further analyses. An additional 17 samples were excluded due to higher than minimal noise level based on analyses using “ContEst” tool from Broad GATK package and Illumina noise percent values.

Results: Interrogation of an inclusive DDRG set of 180 genes predicted to have non-silent effects on the protein sequence (e.g. missense, nonsense, frameshift) for germline mutations

in this cohort revealed several known and novel mutations. The analysis has not been finalized yet. Mutation data will be assessed for association with the extensive available clinical and pathological data, including disease progression (metastasis), family history and African ancestry. Novel mutations, anticipated especially in the understudied AA context, will be analyzed for functional impact.

B076 The effect of C1q and gC1qR in breast cancer: Racial health disparities. Tiana N Reyes, Matthew G Digiovanni, Jennie L Williams, Berhane Ghebrehiwet. Stony Brook University, Stony Brook, NY, USA.

Breast cancer is one of the most highly diagnosed cancers in the US with African American (AA) women developing a more aggressive form of the cancer at a younger age. The complement system, part of the immune system, is tightly regulated and able to eliminate foreign invaders. Complement proteins can induce cancer cell apoptosis or increased proliferation. Cell surface expression of C1q, apart of the classical pathway of the complement system, and its receptor, gC1qR, is enhanced in malignant cells. Upon treatment with antibody to C1q, an antiproliferative effect in breast cancer cells was observed in vitro. Antibody recognizing gC1qR enhances breast cancer cell survival by promoting angiogenesis and metastasis. It was noted in a panel of breast cancer cell lines that MDA-MB-468, an AA derived cell line, did not express gC1qR compared to three Caucasian American (CA) derived cell lines. In a second study, a lower expression level of gC1qR in the membranes of three AA breast cancer cell lines (MDA-MB-468, HCC70, and HCC1500) compared to a CA cell line (MDA-MB-231) was observed. We hypothesize that treatment with anti-C1q will have an antiproliferative effect on breast cancer cell lines, while treatment with anti-gC1qR will have a pro-proliferative effect. One CA (MDA-MB-231) and three AA (MDA-MB-468, HCC1500, and HCC7) breast cancer cell lines were treated with anti-C1q in solution at increasing concentrations where an antiproliferative effect was observed. Coating the culture plate with C1q will determine differential expression. Therefore, the role of C1q and gC1qR on cytokinetics and in racial health disparities are being accessed.

B077 Ribosomal RNAs are fragmented into short RNAs in a manner that depends on a person's sex, population origin, and race: implications for health disparities and personalized medicine. Tess Cherlin, Rogan Magee, Yi Jing, Phillipe Loher, Venetia Pliatsika, Isidore Rigoutsos. Thomas Jefferson University, Philadelphia, PA, USA.

Ribosomal RNAs (rRNAs) are the most abundant RNAs in eukaryotic cells. rRNAs combine with ribosomal proteins to form the scaffold for the small and large subunits of the ribosomes. There are six distinct rRNAs: four are encoded by the nuclear and two by the mitochondrial genome. Deep sequencing showed that short RNAs, known as "rRNA-derived fragments" or rRFs, arise from all six rRNAs. The accumulated evidence suggests that rRFs have key functional roles. Various studies showed that rRFs can modulate intracellular ATP levels, participate in the response to stress, affect ERK signaling, and are required for DNA repair. Moreover, rRFs can be loaded on Argonaute thereby entering the RNAi pathway and regulating transcript abundance. To systematically study rRFs, we developed a computational pipeline and used it to analyze the short RNA profiles of lymphoblastoid cell lines obtained from 434 healthy participants of the 1000 Genomes Project. The 434 individuals represent five human populations, and two races. Men and women are represented evenly in each of the five populations. We analyzed the rRF profiles for each of the six rRNAs in turn, and separately for the five populations and two sexes. Across the 434 individuals, we identified more than 18,000 rRFs each with a normalized abundance ≥ 10 reads per million. Each of the six rRNAs gives rise to 'clouds of rRFs' whose identities and abundances differ characteristically from each rRNA to the next. We found that the clouds of rRFs are produced in a population-specific, race-specific, and sex-specific manner. Like samples, i.e. samples belonging to the same sex and population group, produce rRFs with the same identities and relative abundances, which suggests that rRFs are produced in a regimented manner by currently unknown processes. Preliminary analyses of rRFs in primary cancer samples and cell lines led to similar results. Northern blotting allowed us to independently confirm several of our computational findings. Our laboratory has long focused on the study of microRNAs (miRNAs), miRNA isoforms (isomiRs), transfer RNAs (tRNAs), and tRNA-derived fragments (tRFs) in health and disease. IsomiRs and tRFs play important roles in cells by modulating transcript abundance through Argonaute-loading, translation-stalling, decoying of RNA binding proteins, etc. We were first to show that isomiRs and tRFs are produced constitutively in human tissues and that their profiles depend on a person's sex, population origin, and race, as well as on tissue type, tissue state, and disease. We also reported sex- and/or race-dependent differences for multiple cancers, including those of the prostate, bladder, lung, kidney, and breast. Through the current study, we show for a third category of short regulatory RNAs, the rRFs, that they too depend on personal attributes such as sex, population origin, and race. The finding and the large number

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of rRFs have implications for the study of health disparities, in cancer and other diseases, and for efforts to practice personalized medicine.

B078 FOXA1 genetic alterations in Whites versus Blacks or African Americans in breast and prostate cancer. Jennifer Torres¹, Hariprasad Thangavel², Xiaoyong Fu³, Rachel Schiff³, Meghana V. Trivedi¹. ¹University of Houston College of Pharmacy, Houston, TX, USA, ²University of Houston College of Pharmacy, Houston, TX, USA, ³Lester and Sue Smith Breast Center, Baylor College of Medicine, Houston, TX, USA.

Forkhead box A1 (FOXA1) is a pioneer factor for the nuclear hormone receptors: estrogen receptor and androgen receptor. FOXA1 plays a major role inducing endocrine resistance in breast cancer (BC) and prostate cancer (PC), the two most prevalent cancers in the United States. In this study, we investigated FOXA1 gene alterations across different race and ethnicity using the TCGA PanCan Atlas dataset for BC and PC patients. The BC and PC dataset included 1084 and 494 patient samples, respectively, profiled for copy number alterations (CNA), gene expression, and mutations. In the BC dataset, the samples were from 877 non-Hispanic (81%), 38 Hispanic (3.5%) and 169 patients with no ethnicity data (15.5%). Among them, the majority of patients were White (n=751, 69.3%) followed by Black/African American (AA) (n=182, 16.8%), Asian (n=60, 5.5%), and American Indian or Alaska Native (n=1, 0.09%). Ninety BC patients (8.3%) had no race information. The PC dataset included 152 non-Hispanic (30.8%), 0 Hispanic, and 342 patients with no ethnicity data (69.2%). The samples obtained for the PC study were from White (n=147, 29.8%), Black/AA (n=7, 1.4%), and Asian (n=2, 0.4%) patients. Majority of the PC patients had no racial information (n=338, 68.4%) recorded. In the BC dataset, the incidence of FOXA1 alterations was 16/1070 (1.5%) CNA 24/1082 (2.2%) high mRNA expression, and 31/1066 (2.9%) mutations. Only amplifications were found within the BC patients. In the PC dataset, there were 15/489 (3.1%) CNA, 16/493 (3.2%) high mRNA expression, and 28/494 (5.7%) mutations reported in FOXA1. Deep deletion was found in one of the PC patients while the rest had amplifications. Due to insufficient numbers of Hispanic patients in the datasets, we compared the incidence of various FOXA1 alterations in White vs. Black/AA population using Fisher's exact test. Only FOXA1 mutation rate was significantly higher ($p = 0.03$) in Blacks/AA (2/7, 28.6%) compared to Whites (5/147, 3.4%) in PC, but not in the BC dataset. Comparing the separate results of the FOXA1 CNA and gene overexpression White vs. Black/AA patients were statistically significant in both BC and PC datasets. A majority of FOXA1 mutations were

missense mutations with a few frame shifts in BC and PC. The missense mutation reported in both BC and PC datasets were D226G, D226N, and H247Y. Additional studies are necessary to understand the functional significance of these mutations on the development of cancer. Complete and larger datasets that include the race and ethnicity information from diverse group of patients as well as tumor molecular subtyping are also needed for the assessment of the mechanism of health disparity in BC and PC in minority population in the United States.

B079, PR12 Using whole-exome sequencing of archived FFPE tissue to characterize the mutational landscape of prostate cancer in Nigerian men. Prostate Cancer Transatlantic Consortium Members¹, Jason White², Wei Tang³, Stefan Ambs³, Solomon Rotimi⁴, Mohammed Faruuk⁵, Folakemi Odedina⁶, Clayton Yates². ¹Prostate Cancer Transatlantic Consortium Members, ²Tuskegee University, Tuskegee, AL, ³National Cancer Institute, Bethesda, MD, ⁴Covenant University, Ota, Ogun State, Nigeria, ⁵Ahmadu Bello University, Zaria, Kaduna State, Nigeria, ⁶University of Florida, Gainesville, FL.

Compared to other ancestral groups, men of African ancestry (MAA) have the highest incidence and mortality of prostate cancer (PCa), with African men having the highest. Multiple studies have demonstrated that genetic/biologic differences in African American (AA) tumor biology contribute to PCa development and aggressiveness; furthermore, building evidence suggests that the observed differences are population specific and form unique paths to cancer aggressiveness. Despite this, MAA continue to be underrepresented in PCa studies. This lack of adequate representation greatly diminishes the ability to identify clinical interventions to address this disparate disease. In this study, we used whole exome sequencing of 148 Nigerian PCa FFPE samples (75 Tumor, 62 BPH and 11 non-matched Normal) to determine the mutational landscape of PCa. Samples were collected from 6 sites in central and southwest Nigeria and quality screened. Samples passing QC were sequenced (Illumina HiSeq 4000 PE150) and read files were processed using the Tumor Only Somatic Mutation pipeline developed by the CCR Collaborative Bioinformatics Resource (CCBR). In addition to the CCBR pipeline, Exomiser was used to prioritize non-silent variants according to variant frequency, pathogenicity, quality and model organism phenotype data. 246 genes showed significant ($p \geq 0.05$) tumor mutation and high prioritization (Exomiser score ≥ 0.75). These genes included BCR, KMD1A, MSH6, TLR4 and BMPRI1B with mutation rates of 17%, 13%, 12%, 11% and 8%

respectively. These rates were higher than process matched controls and TCGA tumor samples. Mutation signature analysis showed enrichments in 4 Cosmic signatures. 38.6% of Tumor samples contained signatures similar (cosine similarity [cs] = 0.912) to Signature 1, 29.3% were similar (cs = 0.849) to Signature 4, 14.6% were similar (cs = 0.743) to Signature 5 and 17.3% were similar (cs = 0.635) to Signature 25. Groupwise comparisons of gene mutations and mutation signatures showed that 8 of the 29 tumors ($p \leq 0.06$), having a Signature 1 similar signature, contained a BCR frameshift insertion (c.3275_3278dup) which duplicates a four nucleotide CCGG sequence in exon 19. The relationship between BCR and prostate cancer is still poorly understood; however, within the TCGA PRAD cohort, low BCR expression does significantly ($p \leq 0.024$) correlate with poor survival. These results suggest that mutations within BCR result in a disruption of methylation and expression patterns that could contribute to worse outcomes in Nigerian PCa patients. Without tumor/normal matched pairs, more analysis is needed to ensure the accuracy of this characterization; however, completion of this study would comprise the largest mutational analysis of Nigerian PCa, to date. Understanding the genetic underpinnings of PCa in Nigerian patients will add much needed context to the study of the disease in MAA, further illuminating clinical interventions that may prove beneficial in diminishing outcome disparities.

B080 Assessment of the molecular mechanisms of a protective variant for breast cancer in Latinas. [Valentina A. Zavala](#)¹, Tatiana Vidaurre², Katie Marker³, Sandro Casavilca², Lizeth Tamayo⁴, Carlos Castañeda², Jeannie Vásquez², Fernando Valencia², Zaida Morante², M Calderon², J Abugattas², H Gomez², H Fuentes², C Monge-Pimentel², Silvia Neciosup², Jovanny Zabaleta⁵, Laura Fejerman¹. ¹University of California San Francisco, San Francisco, CA, USA, ²Instituto Nacional de Enfermedades Neoplásicas, Lima, Peru, ³University of California Berkeley, Berkeley, CA, USA, ⁴University of Chicago, Chicago, IL, USA, ⁵Louisiana State University Health Sciences Center, New Orleans, IL, USA.

The incidence of breast cancer is lower in women of Latin American origin in the U.S. compared to European American and African American women. Among Latinas, the rs140068132A>G variant, which is common in women with IAA, has been associated to a lower risk of breast cancer. The frequency of the G allele is 0% for non-Latinos while 12% in Latinos, being highest in the Peruvian population (23%). This variant is located on chromosome 6 near the Estrogen Receptor 1 gene (ESR1) and even though experimental

evidence suggests that this variant might be functional, the molecular mechanisms that explain its protective effect are unknown. We hypothesize that the rs140068132-G variant decreases ESR1 expression, which affects the expression or function of genes involved in associated pathways. We aim to test the association of the rs140068132 variant and gene expression in breast cancer tumors from patients with high IAA. We collected 47 breast tumors and blood samples from the Instituto Nacional de Enfermedades Neoplásicas in Lima, Peru. These patients were genotyped for IAA estimation and determination of the rs140068132 genotype. Total RNA was extracted from tumor samples and used for a paired-end sequencing (2 x 75bp paired-end, 100 million reads per sample) in the Illumina NextSeq500. Differential gene expression between genotypes was performed by DEseq2 R package and statistical significance was determined using $FDR < 0.05$ for samples with at least log₂ 1.5-fold change. Differentially expressed isoforms were detected by EBseq R package using $FDR < 0.05$. Tumor intrinsic subtypes were obtained using PAM50 as implemented in the geneFu R package. The average IAA for the 47 Peruvian patients was 77% (SD=0.17). Twenty-seven patients were homozygous AA, 19 heterozygous AG and 1 GG for the rs140068132 variant. According to PAM50 classification, 10 tumors were Luminal A, 12 Luminal B, 15 HER2+ and 10 Basal. Among luminal tumors there was a suggestive trend towards lower expression of the ESR1 gene in patients carrying the protective allele ($p=0.16$). Including all subtypes, 27 genes were differentially expressed according to the rs140068132 genotype. Four of these genes are ER dependent or associated with ER status. The expression of the top gene, which is a transcriptional target of ER, is lost in patients with the protective allele. This association is mainly driven by its expression in luminal tumors and remained significant after adjusting for IAA. ESR1 isoforms were not differentially expressed by genotype, however significant differences were detected in the expression of isoforms for 115 genes, of which 18% have been reported to be transcriptional targets of ER or functionally related. Our preliminary results suggest that the rs140068132 variant decreases ER expression and affects the expression of functionally associated genes in luminal tumors. Further allele-specific expression analysis will elucidate if this variant is part of a cis-regulatory module.

B081 Common copy number aberrations in breast cancer in Latinas. [Elad Ziv](#)¹, Daniel Schmolze², Donglei Hu¹, Aaron Adamson², Shu Tao², Charleen Adams², Linda Steele², Scott Huntsman¹, Jeffrey Weitzel², Jung Byun³, Kevin Gardner⁴, Eliseo Perez-Stable³, Anna Napoles-Springer³, Susan Neuhausen². ¹University of California, San Francisco, San

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Francisco, CA, USA, ²City of Hope, Duarte, CA, USA, ³National Institute of Minority Health and Health Disparities, Bethesda, MD, USA, ⁴Columbia University, New York, NY, USA.

Background: Latinos represent the largest and fastest-growing minority population in the US; breast cancer is the most common cancer and causes the most cancer deaths in this population. Copy number amplifications and deletions are an important determinant of the biology of breast tumors and, in some cases, may help to guide treatment. However, little is known about the copy number profile of breast tumors from Latinas. For example, in The Cancer Genome Atlas (TCGA), one of the largest publicly available tumor mutation datasets, there are data on only 31 Latina (out of a total of >1000) breast cancer cases. Therefore, we used whole exome sequencing on matched tumor/normal pairs in 146 tumors from 142 women, to investigate copy number aberrations in breast tumors from Latinas. **Methods:** We enrolled 142 Latinas with invasive breast cancer and obtained blood and tumor tissue (formalin-fixed paraffin embedded). We performed whole exome sequencing of 146 pairs of tumor (somatic) and normal (germline) samples resulting in 142 tumor-normal pairs for analysis. Target coverage for normal was ~30X and for tumor was ~100X. Sequence data were aligned using Burrows-Wheeler Aligner, and copy number aberrations were called using CNVkit. We estimated genetic ancestry from the germline genotype data using ADMIXTURE. **Results:** Age at diagnosis ranged from 31 to 75 years with a median age of 48 years. Histologically, 83% were estrogen-receptor positive, 71% were progesterone-receptor positive, and 17% were human epidermal growth factor receptor positive; 87% were Stage 1 or 2 at diagnosis. The mean genetic ancestry in our sample was ~52.3% European, ~41.6% Indigenous American, and ~6.2% African. Large copy number amplifications were detected mostly commonly at 1q and 8q, and large deletions were detected at 11q, 16q and 17p. Genes commonly gained/amplified included MYC (43%), FGFR1 (19.2%), CCND1 (18.0%), and ERBB2 (14.4%). Genes commonly deleted in at least one chromosome include TP53, MAP2K4, BRCA1, PP2R2A, CHEK2, and PALB2. **Summary:** Breast tumors from Latinas display similar rates of large chromosomal copy number gains and losses at common positions and similar rates of gene-specific copy number amplifications and deletions compared non-Latina European ancestry women.

B082 Association of CXCR6/CXCL16 axis in triple-negative breast cancer and racial disparity. Hina Mir¹, Jeronay K Thomas¹, Neeraj Kapur¹, Anita T Johnson², Shailesh Singh¹. ¹Morehouse School of Medicine, Atlanta, GA,

USA, ²Morehouse School of Medicine and Cancer Treatment Centers of America, Atlanta, GA, USA.

Breast cancer (BrCa) is the most common cancer in women worldwide and remains an important global health issue. The American Cancer Society recorded 252,710 new cases of BrCa in the United States in 2017, with 40,610 deaths. Though the incidence of BrCa is higher in Caucasian American (CA), African American (AA) women are often diagnosed with more aggressive TNBC at a younger age. Also, in absence of targeted therapies, cytotoxic chemotherapy remains the backbone of treatment for TNBC. But the median survival of women with advanced TNBC remains dismal. Androgen receptor (AR) has emerged as a potential target for treating TNBC; higher AR expression is a favorable prognostic factor associated with a lower clinical stage, lower histologic grade, and lower mitotic score. Several novel anti-androgenic agents alone or in combination with other agents are currently under investigation. Unfortunately, anti-AR therapies are not as beneficial in AA since AR is often low or missing in AA TNBC. Also, outcome of TNBC in AA is worse than CA, which suggests racial differences in the molecular landscape of TNBC between the two races. Hence, defining the molecular differences in TNBC between racial/ethnic groups is vital in order to effectively reduce the observed disparity in BrCa outcome. There are strong indications of a positive linkage between chemokine, cancer and metastasis. Chemokine receptor CXCR6 and its natural ligand CXCL16 are overexpressed in many cancer cells. We have shown that CXCR6 and CXCL16 axis promotes cancer by cytoskeleton rearrangement and its significance in etiopathogenesis of BrCa is well established. Goal of this study was to establish the association of CXCR6/CXCL16 axis in BrCa disparity using TCGA data and BrCa cell lines. We show overexpression of CXCR6 and CXCL16 in BrCa tissues and cell lines. Expression was higher in AA TNBC compared to CA TNBC cell lines. TCGA data confirms higher CXCR6 and CXCL16 expression in AA compared to CA BrCa and inverse association between androgen receptor (AR) and CXCR6 expression. Low AR expression was found in TNBC expressing high CXCR6 and CXCL16. In addition to this, differential phosphorylation status of signaling molecules down stream of CXCR6 in AA and CA TNBC cells was observed. In conclusion, our work highlights association of CXCR6/CXCL16 in race specific biological differences and emphasizes the potential of CXCR6/CXCL16 as a target to reduce the racial gap in TNBC outcome.

B083 Dysregulation of the AR-Nrdp1-ErbB3 axis occurs in African American prostate cancer patients and is associated with worse outcomes. Anhao Sam¹, Shawna Evans¹, Elizabeth

Browning¹, Sheryl Krig¹, Neelu Batra¹, Thomas Steele², Salma Siddiqui², Paramita Ghosh², Ruth Vinal¹. ¹California Northstate University, Elk Grove, CA, USA, ²VA Northern California Health Care System, Mather, CA, USA.

Background: We previously showed that Nrdp1, an E3 ubiquitin ligase, is transcriptionally regulated by the androgen receptor (AR) in prostate cancer (CaP) cells and that Nrdp1 can post-translationally regulate ErbB3 (an EGFR family member) levels via ubiquitination and subsequent proteasomal degradation. Increased levels of ErbB3 are associated with worse CaP patient outcome. The goal of the current study was to determine whether dysregulation of the AR-Nrdp1-ErbB3 axis contributes to prostate cancer health disparities for African American (AA) men, and to identify the underlying mechanisms involved. **Methods:** Expression levels and localization of AR, Nrdp1, and ErbB3 were assessed in a total of 208 CaP patient samples (50 African American (AA) and 158 Caucasian (CA) CaP patients) and two cell lines (LNCaP (CA) and MDAPCa2b (AA)). Expression levels and localization of these molecules were determined by immunohistochemistry (IHC) and subcellular fractionation and western blot. A combination of knockdown (siRNA), forced overexpression (Nrdp1-FLAG construct), and treatment with enzalutamide or synthetic androgen (R1881) experiments were employed to investigate the relationship between AR, Nrdp1, and ErbB3 expression levels and localization and to identify differences in AA and CA cell lines. Immunoprecipitation allowed for investigation of the mechanisms which facilitate nuclear transport of Nrdp1. **Results:** A statistically significant negative association between cytoplasmic levels of AR (AR C) and nuclear Nrdp1 (Nrdp1 N) exists in both Caucasian (CA) and African American (AA) prostate cancer (CaP) patients, but this association was stronger in AA patients compared to CA patients (Spearman correlation coefficient of -0.62 for AA patients, and -0.36 for CA patients). Increased nuclear Nrdp1 expression levels were associated with increased 5-year survival rates, and reduced nuclear Nrdp1 expression levels predicted biochemical recurrence (AUC 0.63). Dysregulation of the AR-Nrdp1-ErbB3 axis in AA CaP cells was also observed in cell line studies; AA CaP cells expressed significantly lower levels of both total and nuclear Nrdp1 compared to their CA CaP counterparts. Manipulation of AR expression levels and localization via knockdown and inhibition with enzalutamide had a lesser impact on Nrdp1 expression levels and localization in AA versus CA CaP cells. Immunoprecipitation studies demonstrated that Nrdp1 can bind to AR in CA CaP cells but not AA CaP cells. **Conclusions:** Our combined data indicate that dysregulation of the AR-Nrdp1-ErbB3 axis occurs to a larger extent in AA than CA CaP

cells and that this can contribute to worse patient outcomes. Our data also indicate that lack of binding between AR and Nrdp1 in AA CaP cells may account for the lower levels of nuclear Nrdp1 observed in AA CaP cells. Further understanding of the mechanisms which regulate Nrdp1 levels and localization may allow for the development of treatments which help abrogate cancer health disparities.

B084 Dysregulation of the AR-Nrdp1-ErbB3 axis occurs in African American prostate cancer patients and is associated with worse outcomes. [Anhao Sam](#)¹, Elizabeth Browning¹, Shawna Evans¹, Thomas Steele¹, Paramita Ghosh², Ruth Vinal¹. ¹CNUCOP, Elk Grove, CA, USA, ²UC Davis, Sacramento, CA, USA.

Background: We previously showed that Nrdp1, an E3 ubiquitin ligase, is transcriptionally regulated by the androgen receptor (AR) in prostate cancer (CaP) cells and that Nrdp1 can post-translationally regulate ErbB3 (an EGFR family member) levels via ubiquitination and subsequent proteasomal degradation. Increased levels of ErbB3 are associated with worse CaP patient outcome. The goal of the current study was to determine whether dysregulation of the AR-Nrdp1-ErbB3 axis contributes to prostate cancer health disparities for African American (AA) men, and to identify the underlying mechanisms involved. **Methods:** Expression levels and localization of AR, Nrdp1, and ErbB3 were assessed in a total of 208 CaP patient samples (50 African American (AA) and 158 Caucasian (CA) CaP patients) and two cell lines (LNCaP (CA) and MDAPCa2b (AA)). Expression levels and localization of these molecules were determined by immunohistochemistry (IHC) and subcellular fractionation and western blot. A combination of knockdown (siRNA), forced overexpression (Nrdp1-FLAG construct), and treatment with enzalutamide or synthetic androgen (R1881) experiments were employed to investigate the relationship between AR, Nrdp1, and ErbB3 expression levels and localization and to identify differences in AA and CA cell lines. Immunoprecipitation allowed for investigation of the mechanisms which facilitate nuclear transport of Nrdp1. **Results:** A statistically significant negative association between cytoplasmic levels of AR (AR C) and nuclear Nrdp1 (Nrdp1 N) exists in both Caucasian (CA) and African American (AA) prostate cancer (CaP) patients, but this association was stronger in AA patients compared to CA patients (Spearman correlation coefficient of -0.62 for AA patients, and -0.36 for CA patients). Increased nuclear Nrdp1 expression levels were associated with increased 5-year survival rates, and reduced nuclear Nrdp1 expression levels predicted biochemical recurrence (AUC 0.63).

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Dysregulation of the AR-Nrdp1-ErbB3 axis in AA CaP cells was also observed in cell line studies; AA CaP cells expressed significantly lower levels of both total and nuclear Nrdp1 compared to their CA CaP counterparts. Manipulation of AR expression levels and localization via knockdown and inhibition with enzalutamide had a lesser impact on Nrdp1 expression levels and localization in AA versus CA CaP cells. Immunoprecipitation studies demonstrated that Nrdp1 can bind to AR in CA CaP cells but not AA CaP cells. Conclusions: Our combined data indicate that dysregulation of the AR-Nrdp1-ErbB3 axis occurs to a larger extent in AA than CA CaP cells and that this can contribute to worse patient outcomes. Our data also indicate that lack of binding between AR and Nrdp1 in AA CaP cells may account for the lower levels of nuclear Nrdp1 observed in AA CaP cells. Further understanding of the mechanisms which regulate Nrdp1 levels and localization may allow for the development of treatments which help abrogate cancer health disparities.

B085 Low-sensitivity and drug-resistance to DNA-demethylating epi-drug decitabine in solid tumors: A challenge yet to overcome.

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Based on the current understanding of the epigenetic landscape, cancer methylome is highly disrupted, which makes DNA methylation an excellent target for anti-cancer cures. To date, azacytidine and its congener, decitabine (DAC) are the most successful DNA demethylating epigenetic drugs. However, scientists are yet to find the reversal of clinical resistance to these drugs. Yet another challenge remains to be the decreased efficacy of these promising therapies in the cure of solid tumors. We used a solid tumor, HCT116 colorectal cancer cell line and developed resistance against DAC. DAC-resistant HCT116 cells were used to study the epigenetic cross-talk between DNA methylation and chromatin modifications. The screening of parental and DAC-resistant HCT116 cells against inhibitors of epigenetic writers-erasers-readers unveiled increased sensitivity of resistant cells to BET inhibitor (inhibitor of reader enzymes), (+)-JQ1. BET inhibitor further mediated augmented response on cell cycle phases of resistant cells, increased anti-proliferative effects in xenograft models of resistant cells, and synergistic effects in combination with DAC in HCT116 parental cells, both in vitro and . We then sequenced the transcriptome of DAC-sensitive and -resistant HCT116 cells, and (+)-JQ1 treated-(DAC-resistant) cells, using RNA-seq. The RNA-seq data revealed the overexpression of critical oncogenes, and

their binding inactivation of key tumor suppressor genes (TSGs) in resistant cells. The most significant and biologically relevant transcriptional changes were further validated by qRT-PCR, and in addition their methylation status was determined by bisulphite sequencing. We discovered that the expressions of down-regulated TSGs were driven by promoter methylation, exposing these tumor-suppressive signatures as biomarkers which might differentiate between DAC-resistance and sensitivity, whereas, overexpression of oncogenes was independent of promoter methylation. Interestingly, the expressions of up-regulated oncogenes which define cell identity, mainly those involved in signaling of inflammatory pathways (including some bromodomain-specific genes) were reversed on treatment with (+)-JQ1. Further, siRNA-mediated genetic inhibition of bromodomains in resistant cells phenocopied therapeutic inhibition by (+)-JQ1. These data unveil the chromatin “reader proteins”, as regulators of dysregulated oncogenic expressions in DAC-resistant cells. The present study provides novel insights into the epigenomic landscape of DAC-resistant colorectal cancer cells, and put forward, the alternative therapeutic regimen for DAC-resistant patients. This study was supported by Czech Ministry of Education, Youth and Sports (LO1304, LM2015091, LM2015064), Technology Agency of the Czech Republic (TE01020028) and Internal Grant Agency of Palacky University (IGA_LF_2016_019).

B086 Short-term effects of immigration on the development of breast cancer in women of African descent.

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Introduction Haitians diagnosed with breast cancer in Haiti experience a significantly worse outcome than immigrants in Miami that appears to be related to 1) more advanced stage, 2) younger age, 3) more ER-negative tumors, and 4) lack of timely effective treatments including restricted access to trastuzumab and radiation. The objective of the study was to evaluate the epigenetic differences by DNA methylation between women of African descent who have breast cancer and are native to Haiti, the USA or who have emigrated from Haiti to the USA. Methods The study was IRB approved and conducted between 2017-2019 at University of Miami (n=50), Ministry of Health Haiti and Innovating Health International (n=35) and Moffit Cancer Center (n=14). DNA were extracted from saliva (DNAGenotek PrepIT-LP), FFPE breast tumor and normal adjacent breast epithelia (QIAmp DNA FFPE kit) when available. Reduced representation bisulfite sequencing was performed by BGI Inc (Cambridge MA) with EZ DNA methylation gold kit (Zymo) and followed by directional BS-sequence library preparation on HiSeq x Ten, PE150. Data was processed in methylKit package and analyzed in a two-step filtering process to 1) include 200bp tiled regions to maximize CpG coverage, > 10 read coverage, <400 read coverage, >3 shared CpGs per group or all samples if the number of samples was less than 3 in the group, $q < 0.05$ and 2) study DMRs only in ER+ breast tumors. Results The mean age of Haitian natives (H) (49.4 years), Haitian Immigrants (HI) (51.9 years) and African American (AA) (48.6 years). The H were in the US for a range of 5-47 years. 64.7% of H, 63% of HI and 42.9% of AA were diagnosed at stages III/IV. Differentially methylated regions (DMRs) were assessed between groups for germline, tumor and normal breast epithelial. There were significantly more DMRs in germline DNA than tumor for each comparison group. The DMRs identified in germline DNA; AA vs HI=54,150 DMRs, HI vs H=45,031 and H vs AA=40,461 DMRs. In the tumors, there were more DMRs between HI and AA (556 DMRs) than H vs AA (33 DMRs) and H vs AA (3 DMRs). Pathway analysis of DMRs identified in germline DNA amongst the three groups revealed common tumor molecular mechanisms of cancer, AMPK and CREB signaling. Whereas Wnt3a, EZH2, PI3K and molecules involved in DNA damage and cell cycle were distinct effectors in tumors of each group. Conclusion This work provides data for exploring the biological basis of breast cancer subtypes within the US Black sub-populations stratified by time and nativity. Haitian immigrants and US born Black women with breast cancer have more epigenetic differences and represent unique pathways which drive tumor biology.

B087 Role of GATA-4-Androgen-AR axis in prostate cancer from African American men. Swathi Ramakrishnan, Xuan

Peng, Eduardo Cortes Gomez, Kristopher Attwood, Li Yan, John Wilton, Gissou Azabdaftari, James Mohler, Jianmin Wang, Anna Woloszynska. Roswell Park Comprehensive Cancer Center, Buffalo, NY, USA.

Background: African American (AA) men are 1.7 times more likely to develop and 2.4 times more likely to die of prostate cancer (PrCa) than their European American (EA) counterparts, however the underlying biology causing this disparity is unknown. Here, we show how epigenetic dysregulation of calcium signaling genes affect GATA-4, androgen receptor (AR), androgen metabolism and associate with clinical outcomes in AA men with PrCa. Methods: Using Illumina arrays we identified DNA methylation differences between 32 EA and AA PrCa patients. We used RNA-sequencing to discover transcriptomic changes potentially mediated by DNA methylation. We measured GATA-4 and AR protein expression in a tissue microarray (TMA) of 95 EA and 92 AA PrCa patients. We measured testosterone (T) and dihydrotestosterone (DHT) in serum of the same AA and EA PrCa patients. *In vitro*, we treated MDA PCa 2a (2a) and LaPC4 cells derived from AA and EA prostate tumors, respectively with a calcium chelator (BAPTA-AM) and T. We measured GATA-4 and AR protein expression in control and treated cells. Results: Our DNA methylation analysis showed that AA but not EA prostate tumors enriched for hypermethylated sites in calcium sensing genes was associated with worse disease-free time (21.6 vs 46.7 months, $p < 0.05$). DNA hypermethylation of calcium signaling genes, which correlated with decreased transcript levels, can potentially raise intracellular calcium. Calcium levels regulate stability of proteins including AR and GATA-4. Therefore, we tested potential calcium mediated changes in GATA-4 and AR expression *in vitro* and in patient samples. *In vitro*, depleting calcium in the presence of T increased GATA-4 protein expression by 1.5 times and AR expression only in AA prostate tumor derived 2a cells. DNA hypermethylation of calcium sensing genes was associated with lower GATA-4 and AR expression in PrCa and adjacent non-tumor tissues of AA men. The role of GATA-4 in PrCa is unknown, but it is a known transcriptional regulator of androgen metabolizing enzymes (AME). AMEs are important for androgen metabolism that result in T and DHT production through the primary and alternative pathways. AME transcripts in the primary and alternative pathways were one of the top 5 transcriptionally dysregulated pathways in AA compared to EA prostate tumors. We found that T but not DHT is significantly lower ($p < 0.05$) in serum samples from AA (3.64ng/ml) compared to EA (3.99ng/ml) PrCa patients. T and DHT bioavailability in prostate tumors affect AR expression and function. In our studies, AA adjacent non-tumor tissues had higher percent

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AR positive nuclei ($p < 0.05$) compared to EA adjacent non-tumor tissues. Conclusion: Epigenetic alteration of calcium signaling can affect GATA-4 mediated changes in androgen metabolism and AR signaling that are well-established therapeutic targets in PrCa. This molecular alteration, unique to AA prostate tumors, can be used to rationalize specific androgen deprivation and AR-targeted therapies in these patients.

B088, PR13 Loss of alpha-catenin expression is associated with race, aggressive disease, and chemoresistance in triple-negative breast cancer. [Rania Bassiouni](#)¹, Sandeep Singhal², Lee D Gibbs¹, Yunchi Li¹, Patrick Pirotte³, Nasreen Vohra⁴, Kevin Gardner², John D Carpten¹. ¹University of Southern California, Los Angeles, CA, USA, ²Columbia University Medical Center, New York, NY, USA, ³Translational Genomics Research Institute, Phoenix, AZ, USA, ⁴East Carolina University, Greenville, NC, USA.

Triple negative breast cancer (TNBC) is an aggressive and difficult-to-treat subtype of the disease. A well-documented health disparity exists within TNBC: African American (AA) women are more likely to be diagnosed with and die from the disease. Our group previously reported homozygous deletions in the CTNNA1 gene, which encodes the protein alpha-catenin, in AA TNBC. We have undertaken a basic and translational research study to understand the mechanistic role and clinical impact of alpha-catenin loss in TNBC, particularly in AA patients. To explore the association of alpha-catenin loss with race, we first examined gene expression data available in the TCGA. We determined that race was significantly associated with alpha-catenin expression, with lower expression found in AA patients. We also found a significant over-representation of AA patients in the lowest subset of expressers. We validated this association in an independent, racially diverse cohort comprising 460 breast cancer patients. Interestingly, we observed loss of nuclear alpha-catenin specifically to be associated with race. We also found strong associations between low alpha-catenin expression and survival, tumor stage, and lymph node metastasis. While its junctional role has been well studied, little is known about nuclear alpha-catenin and its role in disease. To understand the nuclear function of alpha-catenin, we sought to identify its nuclear binding partners by performing co-immunoprecipitation followed by mass spectrometry. We found nuclear alpha-catenin to interact with ATR, a kinase critical to the DNA damage response and G2/M checkpoint. To determine whether loss of alpha-catenin affected ATR function, we developed several isogenic cell line pairs. Using CRISPR/Cas9-mediated

gene editing, we generated CTNNA1 knockout BT-549, MB-MDA-436, and MDA-MB-231 cell lines. We also reintroduced CTNNA1 into MDA-MB-468 cells – a line derived from an AA woman with an endogenous deletion in CTNNA1. Using these models, we found that loss of alpha-catenin promoted greater ATR activation in response to DNA damage. This was accompanied by increased phosphorylation of downstream effector proteins, including Chk1 and RPA2. Consistent with ATR hyperactivation, we found cells lacking alpha-catenin to be more sensitive to inhibitors of ATR and the G2/M checkpoint kinases Chk1 and Wee1. Additionally, alpha-catenin loss promoted DNA damage repair, thus decreasing sensitivity to DNA-damaging chemotherapies clinically utilized for TNBC treatment. In our studies, we have identified nuclear alpha-catenin as a tumor suppressor that affects TNBC's susceptibility to chemotherapy by playing a role in ATR-directed DNA repair. Our data suggest that loss of alpha-catenin is more common in AA patients, and is associated with aggressive disease and poor prognosis. Therefore, CTNNA1 status may be important in determining appropriate therapeutic strategies for this subset of patients, which is disproportionately effected by the disease.

B089 Kaiso as a novel therapeutic target in castration-resistant prostate cancer. [Huixian Lin](#)¹, Honghe Wang¹, Jason White¹, Balasubramanyam Karanam¹, Anghesom Ghebremedhin¹, Benjaminal Adu-Addai¹, William Grizzle², Clayton Yates¹. ¹Tuskegee University, Tuskegee, AL, US, ²University of Alabama at Birmingham, Birmingham, AL, US.

Androgen receptor (AR) is a critical driver in the progression of prostate cancer (PCa). However, the PCa develops to castration resistant prostate cancer (CRPC) in almost 53% of patients after 18-32 month's therapy. Metastatic CRPC has poor prognosis and mean survival time is fewer than 2 years. Kaiso belongs to a BTB/POZ zinc finger protein family and is known as a transcriptional repressor. Kaiso expression and localization have been reported to correlate with the prognosis and metastatic potential in several human malignancies. Previous works from our lab have demonstrated that transcription factor Kaiso was upregulated in the progression of PCa. Therefore, our objective is to explore the interrelationship between Kaiso and AR, further to clarify Kaiso as a potential therapeutic target in PCa progression and CRPC. To investigate molecular mechanisms underlying how aberrant expression of Kaiso contributes to CRPC, the androgen sensitive human prostate cancer LNCaP cells were treated with 10 μ M anti-androgen Enzalutamide (MDV3100). Kaiso expression levels were

increased as detected by RT-PCR and immunofluorescence. To systematically investigate Kaiso targets in PCa, we performed Kaiso ChIP-Seq assay using prostate cancer cell lines LNCaP, C4-2B and PC3. The Kaiso ChIP-Seq peaks indicate androgen receptor motif enrichment in AR expressing LNCaP and C4-2B cells but not in AR-negative PC3 cells, indicating Kaiso could cooperate with AR as co-regulator and potentially control transcription of a subset of its target genes. The interaction of them was confirmed by co-immunoprecipitation of AR using Kaiso antibody in LNCaP cells. To identify Kaiso target genes that interacted with AR pathway, Kaiso knockdown and overexpression stable cell lines were established in LNCaP cells and C42B cells. RT2 Profiler PCR array of AR pathway were performed using LNCaP scramble (LNCaP-Scr) cells and shKaiso cells. The results showed multiple genes were upregulated and downregulated, such as FOLH1, PTEN, RAC3 and IGF1. More importantly, LNCaP Kaiso overexpression cells were more resistant to MDV3100 treatment compared to resistance observed in LNCaP-Scr cells. There were significant negative correlations between Kaiso expression levels and castration-sensitivity. Our results suggest that Kaiso is a novel AR-interacting protein. Kaiso regulates the genes in AR pathway. Targeting Kaiso presents a potential therapeutic strategy for disrupting AR signaling in CRPC and may prevent CRPC development.

B090 Molecular mechanisms of microRNA-1205 in aggressive prostate cancer in men of African ancestry. [Michelle K. Naidoo](#)¹, [Fayola Levine](#)², [Xavier Graña-Amat](#)³, [Olorunseun Ogunwobi](#)². ¹Graduate Center of the City University of New York, New York, NY, USA, ²Hunter College of the City University of New York, New York, NY, USA, ³Lewis Katz School of Medicine Temple University, Philadelphia, PA, USA.

High mortality rates of prostate cancer (PCa) are associated with metastatic castration-resistant prostate cancer (mCRPC) due to the maintenance of androgen receptor (AR) signaling despite androgen deprivation therapies (ADTs). Resistance towards second generation ADTs leads to the progression of AR-independent neuroendocrine PCa (NEPC) phenotypes, which are observed in nearly 1 in 5 men with mCRPC and is associated with short survival rates. Moreover, men of African ancestry (moAA) have a higher NEPC incidence and mortality rates, compared to Caucasian males. PCa neuroendocrine differentiation (PCND) is observed in treatment related NEPC, however, this mechanism is poorly understood. Therefore, further understanding of PCND in ADT resistance may prevent poorer outcomes. The 8q24 chromosomal locus is an important PCa susceptibility region containing

genetic variants associated with increased PCa incidence among moAA. PVT1 is a gene located within this region that encodes microRNA-1205 (miR-1205), whose function is largely unknown. We have previously reported that miR-1205 is underexpressed in a cohort of histologically confirmed PCa tissue obtained from moAA, when compared to normal tissue and is also underexpressed in vitro in CRPC cells, when compared to non-CRPC cells. We also demonstrated that exogenous miR-1205 significantly inhibited tumor volume in CRPC-derived xenograft male NOD/SCID gamma mice, suggesting that miR-1205 is a tumor suppressor. To understand the molecular mechanism of miR-1205, we demonstrated that miR-1205 directly targets Fry-like (FRYL). FRYL is predicted to regulate dendritic branching leading to the hypothesis that FRYL plays a role in PCND. To examine miR-1205 regulation of FRYL in NEPC, we examined RNA sequencing data from a cohort of histologically confirmed NEPC tissues (n=14) and PCa adenocarcinoma tissues (n=30) obtained from TCGA using the cBioPortal platform. We observed increased FRYL mRNA expression in NEPC tissues when compared to PCa adenocarcinoma tissues. In vitro data revealed that FRYL mRNA was overexpressed and miR-1205 was significantly underexpressed after fourteen days of induced PCND differentiation using LNCaP cells when compared to undifferentiated LNCaP cells. Lastly, we performed RNA pulldown, and subsequent RNA sequencing to identify the molecular targets of miR-1205. Interestingly, we observed that in addition to FRYL, the AURKA gene, which is amplified during PCND, was significantly enriched. In conclusion, these data suggest that miR-1205 regulation of FRYL may be a critical mechanism in NEPC. Further understanding this molecular mechanism may provide novel insights into overcoming ADT resistance in aggressive PCa that disproportionately affects moAA.

B091 Molecular alterations in black and Hispanic women with early breast cancer. [Preethi Prasad](#)¹, [Cristina Montagna](#)², [Jesus D. Anampa Mesias](#)¹, [Maja Oktay](#)¹, [Joseph A. Sparano](#)¹. ¹Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, NY, USA, ²Albert Einstein College of Medicine, Bronx, NY, USA.

Background: Black race is associated with inferior outcomes in early breast cancer, including hormone-receptor (HR) positive and HER2-negative disease, even when receiving comparable adjuvant systemic chemotherapy and endocrine therapy (Sparano et al. JNCI 2012; Albain et al. AACR SABCS 2018, abstract GS4-07). Hispanic ethnicity is associated with lower breast cancer incidence but higher mortality rates than non-Hispanic whites. Molecular differences in breast

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cancer could account for these disparities. A prior report based on Whole Exome Sequencing (WES) from the Cancer Genome Atlas (TCGA) in 105 African-American women showed higher rates of TP53 mutations and lower frequency of PIK3CA mutations (Keenan et al. JCO 2017), whereas data in Hispanics is limited. We use a custom sequencing panel called the Einstein Comprehensive Cancer Panel (ECCP) of ~150 genes commonly mutated in malignancies (Miller et al. Oncotarget 2017) in a cohort of 20 non-Hispanic black (NHB) and 24 Hispanic (H) women with early breast cancer. Methods: Ion AmpliSeq targeted libraries were prepared from genomic DNA isolated from breast tumor and adjacent non-tumor tissues and sequenced on the Ion Proton platform. Sequencing reads were analyzed using the Ion Torrent Suite's Torrent Variant Caller followed by the Ion Reporter Software for variant calling and annotation. Results: Samples for 20 NHB and 24 H women were analyzed. The characteristics of the NHB/H cohorts were similar in age (median 55/59 years), stage (61%/73% with Stage II-III), and HR+/HER2-negative subtype (70%/77%). In NHB women, the most frequent pathogenic mutations were in TP53 (20%), PIK3CA (15%), BRCA1 (10%), CDH1 (10%), and KM2TC (10%). Of the NHB patients who recurred, 33% had a pathogenic mutation in TP53 and 16% in KRAS. Of NHB women with HR+ HER2- disease, the most common pathogenic mutations were in PIK3CA (21%) followed by CDH1, TP53, KM2TC, and BRCA1 (all 14%). In H women, the most frequent pathogenic mutations were in PIK3CA (50%) and TP53 (21%) followed by CDH1, FAT4, ATM, and KM2TC (all 8%). Of NHB women with HR+ HER2- disease, the most common pathogenic mutations were in PIK3CA (55%), TP53 (11%), and FAT4 (11%). Of the H patients who recurred, one had a deleterious mutation in TP53, BRCA1, and PIK3CA while the other had a deleterious mutation in GATA3. Conclusions: We found that the NHB and H patients had different molecular profiles despite similar clinical presentations with regard to age, stage, and subtype. The most notable finding was the very high rate of PIK3CA/PIK3R1 (50%) in breast cancers occurring in Hispanic women, which has implications for screening H women with metastatic breast cancer for PIK3CA-directed therapies such as alpelisib. The cohort has variants of unknown significance with mutations in genes that are not described in the literature as well as some hypermutated patients. This study indicates the importance of expanding molecular testing in diverse populations.

B092 Epstein-Barr virus prevalence in classical Hodgkin lymphoma tumors by race/ethnicity in a multiethnic U.S. population. Rachel Bolanos¹, Amie Hwang¹, Jose Aparicio², Chun Chao³, Naba Qurashi¹, Christopher Flowers⁴, Sheeja

Pullarkat⁵, David Conti¹, Sophia Wang⁶, Karen Mann⁴, Leon Bernal-Mizrachi⁴, Joo Song⁶, Christian Steidl⁷, Imran Siddiqi¹, Wendy Cozen¹. ¹Keck School of Medicine, University of Southern California, Los Angeles, CA, USA, ²Keck School of Medicine, University of Southern California, Southern California Kaiser, Los Angeles, CA, USA, ³Southern California Kaiser, Pasadena, CA, USA, ⁴Emory University, Atlanta, GA, USA, ⁵University of California at Los Angeles, Los Angeles, CA, USA, ⁶City of Hope National Medical Center, Duarte, CA, USA, ⁷University of British Columbia and British Columbia Cancer Agency, Vancouver, BC, CA.

Background Classical Hodgkin lymphoma (cHL) is one of the most common cancers among adolescents and young adults (AYA). Incidence rates vary by demographic factors, with the highest incidence in whites of high SES. Malignant Hodgkin Reed-Sternberg (HRS) cells comprise a small percentage of the tumor (about 1%), with the remainder composed of various immune cells (tumor microenvironment, TME). The TME in cHL predicts survival and response to treatment in NHW, but has not been examined in diverse populations. We implemented a study to examine the TME and survival by race/ethnicity and SES in a multiethnic, multicenter set of 1,536 U.S. cHL cases. We conducted an initial analysis of factors associated with EBV status in tumors. Methods FFPE tumor blocks for 649 cases diagnosed from 1996-2016 were identified to date. Diagnosis and histological subtype was confirmed by pathology review for 554. Tissue microarrays were constructed with two 2 mm cores from each case with 29 cases on each array. EBER was assessed using in situ hybridization and scored as negative, positive in HRS cells or positive in the surrounding normal infiltrate. Demographic and clinical information, including the anatomic site of the biopsy, subtype, race/ethnicity (Hispanic, African American [AA], Asian, Native American, NHW), age at diagnosis and gender was collected. Multiple logistic regression was conducted to assess the relationship between age at diagnosis, race/ethnicity, gender, subtype and EBV tumor status. Results Race data was available at this time for 549 cases including 153 NHW, 235 Hispanics, 110 AAs, 36 Asians, 2 Native Americans and 13 with unknown race. 260 (47%) were female. EBV prevalence was available for 393 cases, with 316 nodular sclerosis (NS), 52 mixed cellularity (MC), 8 lymphocyte depleted (LD), 3 lymphocyte rich (LR), and 14 not otherwise specified (NOS). Age at diagnosis ranged from 5-87 years of age, with 189 (48.09%) in AYA (15-35 y). EBV+ by histology was 12.5% for LD, 33% for LR, 47% for MC, 25% for NS, and 29% for NOS. Histologic subtype was a statically significant predictor of EBV tumor status ($p=.0007$), even after adjusting for age, sex, and race/ethnicity ($p=.0085$). Among NS cases, EBV+ was similar across racial/ethnic

groups. However, there was a much higher prevalence of EBV+ in AA (73%) compared to NHW and Hispanic (36-42%) MC cases. HIV/AIDS status was available for 40% of the AA cases but none were positive. There was no correlation between year of diagnosis and the presence of EBV in tumors ($r=0.05$, $p=0.42$), thus block storage time did not affect the results. Conclusions This is the largest study of the Hodgkin lymphoma TME in a racially and ethnically diverse population. In an initial analysis, histologic subtype was the strongest predictor of positive EBV tumor status. Unlike previous reports, EBV-positive tumors were not more common among non-whites, except for AA MC cases. We expect to confirm these results in a larger sample as more cases are accrued.

B093 Upregulated and downregulated microRNA-signatures in thyroid cancer health disparities. Ryan Davis¹, Yan C Wongworawat¹, Mia C Perez², Krystal Santiago¹, Saurav Roy¹, Charles Wang¹, Alfred A Simental¹, Salma Khan¹. ¹Loma Linda University, Loma Linda, CA, USA, ²Loma Linda University, Loma Linda, CA, USA.

Filipino Americans (FA) are known to have a higher incidence, recurrence, and mortality of thyroid cancer (TC) than other Asians Americans or European Americans (EA). Understanding the molecular mechanisms that underpin the genetic defect in metabolism and their impact on thyroid cancer oncogenesis in FA are critical for addressing the health disparity. Mechanisms that link genetic defects and lifestyle factors to thyroid cancer progression have not been defined. Lifestyle and genetic variations among FA lead them to a higher risk of metabolic diseases but no study showed to elucidate the mechanism of thyroid health disparities cancer so far. Recent studies clearly demonstrate that miRNA plays an important role in carcinogenesis via targeting both oncogene and tumor suppressor gene and lifestyle changes may potentially alter miRNA signatures. Therefore, we hypothesize that miRNA expression contributes to tumor grade, prognosis, and thyroid cancer health disparities. We examined miRNA expression profiles in FA vs. EA. We analyzed miRNA-sequence (miRNA-seq) by next-generation sequencing (NGS). The pathways linked to miRNAs were analyzed by ingenuity pathway analysis (IPA) software. Correlations between disease staging to miRNA upregulation and downregulation were elucidated. Both upregulated and downregulated miRNAs were validated by quantitative real-time PCR (qPCR) using miRNA extracted from paraffin-embedded thyroid tissues. We found hundreds of upregulated and downregulated miRNA and piRNA from this study. We chose 10 miRNA down-regulated, and 10 up-regulated miRNA FA compared to EA TC patients ($p<0.05$).

Quantitative PCR (qPCR) was done to confirm our NGS data. Differential miRNA expressions between FA vs. EA patient tumor tissues were observed with advanced staging. Evolutionarily conserved miRNA clusters, which are known to initiate malignancy, were shown to be upregulated in FATC vs. EATC. While those miRNAs are known to regulate pathways involved in cancer invasion and metastasis, they were shown to be down-regulated in FATC patients vs. EATC. The significantly top ten down-regulated/upregulated miRNA-signature suggests that it can be a diagnostic, prognostic, and predictive biomarker in TC health disparities.

B094 Regulation of megalin by vitamin D as the mechanism for differential levels of intra-prostatic androgens between African American and Caucasian men. Jason Garcia¹, Zachary Richards², Morgan Zenner², Yancai Wang¹, Peter Gann¹, Gail Prins¹, Larisa Nonn². ¹UIC, Chicago, IL, USA, ²UIC, Chicago, IL, USA.

Prostate cancer (PCa) is a hormonally driven cancer and is currently the third most common cancer in the US. African American (AA) men are disproportionately at risk for both PCa and vitamin D (vitD) deficiency compared to white men. The numerous chemopreventative properties of vitD and epidemiological relationship of vitD status with PCa aggressiveness and mortality has led to the hypothesis that vitD deficiency is a biological contributor to PCa disparity in AA men. Our lab recently reported an unexpected relationship between serum and intraprostatic vitD metabolites 25-hydroxyvitamin D (25(OH)D) and 1,25-dihydroxyvitamin D in AA men. We also observed that Megalin, a multi-liganded endocytic membrane receptor encoded by the gene LRP2, was expressed in the prostate epithelium and is regulated by vitD. Extra-renal activity of Megalin has not been well studied as the widely accepted Free Hormone Hypothesis assumes passive diffusion of circulating free hormones into tissues. The presence of megalin suggests that globulin bound hormones from the circulation, including 25(OH)D bound to vitamin D binding protein (DBP) and testosterone (T) bound to sex hormone binding globulin (SHBG), are imported into the prostate in a regulated manner. Here we examine megalin as a potential mechanism to regulate globulin bound hormone import into the prostate. 25(OH)D decreased expression of LRP2 in primary prostate epithelial cells and fresh human prostate tissue slice explants. DBP-bound 25(OH)D and SHBG-bound T were imported into these prostate models and transcriptionally active. Lastly, we quantified T and its active metabolite dihydrotestosterone (DHT) in the patient cohort from our prior study. Prostatic DHT levels inversely

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correlated with serum 25(OH)D status. AA men had higher levels of DHT in prostate tissue compared to white men. These clinical findings support our hypothesis that vitD status regulates intraprostatic hormone levels. In summary, we report the presence of a negative feedback loop in which vitD deficiency increases hormone import into prostate epithelium via megalin. Therefore, the upregulation of megalin in the setting of vitamin D deficiency may facilitate increased import of circulating sex steroids into the prostate contributing to carcinogenesis in AA men.

B095 Tackling chemotherapy resistance of cancer cells: Inhibition of diacylglycerol O-acyltransferase 2 increases ceramide and cancer cell apoptosis. Rideeta Raquib¹, Maria J. Hernández-Corbacho², Lina M. Obeid². ¹Stony Brook University, Stony Brook, NY, USA, ²Stony Brook Medicine, Stony Brook, NY, USA.

Cellular stress induced by chemotherapy results in the activation of cell death pathways. The efficacy of chemotherapy can be hindered by the upregulation of proteins that inhibit pro-apoptotic effectors. Ceramide sits at the center of the sphingolipid pathway and Obeid et al demonstrated that exogenous treatment of ceramide induced apoptosis in leukemic cells, whereas cell stressors increase endogenous ceramide levels upstream of caspase activation. The enzyme, diacylglycerol O-acyltransferase 2 (DGAT2), can cause O-acylation of ceramide to 1-O-acylceramide, which is then accumulated in lipid droplets and does not have pro-cell death function. Senkal et al. illustrated that the conversion of ceramide to 1-O-acylceramide causes HCT-116 colon cancer cells to become resistant to chemotherapy 5-fluorouracil (5-FU). Knockdown of the DGAT2 gene showed increased levels of ceramide, decreased levels of 1-O-acylceramides, and sensitized cancer cells to 5FU indicated by a higher caspase 3/7 activation in knockdown cells treated with 5FU than control. Mouse models were employed to demonstrate that a four-week oleate high-fat diet resulted in greater lipid droplet formation and accumulation of acylceramide in the liver versus a control diet, as detected by light chromatography and mass spectrometry (LC-MS). These data demonstrate that the conversion of ceramide to 1-O-acylceramide might act as a survival mechanism and promote chemotherapy resistance and that diet upregulates this process. Thus, we hypothesize that utilizing the commercially available DGAT2 inhibitor (PF-06424439) can increase ceramide in cancer cell lines, hence increase cell death. Treatments of various cancer cell lines, such as MDA-MB-231, MCF-7, and PC3 cells with a chemotherapeutic (cisplatin, doxorubicin, or paclitaxel) were administered alone or paired with PF-06424439 for various

time points. Cell viability was quantified via an MTT assay. Oxidoreductase enzymes reduce the MTT dye to insoluble formazan, which exhibits a purple color and represents the reductive activity present in the mitochondria of living cells. Cell death was quantified via lactate dehydrogenase (LDH) release from damaged cells. Greater cell death was observed when both chemotherapy and PF-06424439 were administered in combination versus chemotherapy alone. Ceramide levels were quantified with LC-MS and greater ceramide levels were seen in the combination treatment, hence affirming that ceramide may have a role in mediating cell death. The physiological implications of the combination treatment and factors such as diet will be evaluated via *in vivo* models in future studies.

B096 Predictors of survival in black and white patients with malignant pleural mesothelioma. Naomi Alpert¹, Maaike van Gerwen¹, Nisha Ohri², Raja Flores¹, Emanuela Taioli¹. ¹Icahn School of Medicine at Mount Sinai, New York, NY, USA, ²Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA.

Purpose: Malignant pleural mesothelioma (MPM) is a rare cancer, particularly among black patients, with a very poor prognosis. There is only one study directly examining prognostic factors of survival in white and black patients with MPM, based on SEER. The goal of this study was to use a large, nationwide cancer database to examine factors associated with survival in black and white patients with MPM. Methods: We used the National Cancer Database (NCDB) to identify black and white patients diagnosed with MPM from 2004-2013. Multivariable Cox proportional hazards models, stratified by race, were used to assess factors associated with overall survival (OS), using adjusted hazards ratios (HR_{adj}) and 95% confidence intervals (CI). Covariates included age, gender, ethnicity, zip-code level education and income, insurance, Charlson-Deyo comorbidity score, histology, laterality, stage, receipt of treatment (surgery, chemotherapy, radiotherapy), hospital characteristics, and year of diagnosis. Results: There were 15,828 patients included; 15,109 white (95.5%) and 719 black (4.5%). After adjustment, black patients were significantly younger, living in areas characterized by lower educational attainment and income, more likely to be on Medicaid, to be from the South and to live closer to their hospital. Though not significant, black patients were less likely to receive surgery, radiotherapy, and chemotherapy than white patients. There were several differences in factors associated with OS for black and white patients. OS was significantly worse for older patients, but the association was stronger in black patients

(HR_{adj} [white]: 1.86, 95% CI: 1.56-2.21; HR_{adj} [black]: 7.18, 95% CI: 3.39-15.20 for ≥80 vs. <50 years). A higher comorbidity score was associated with worse OS (HR_{adj} [white]: 1.28, 95% CI: 1.19-1.37; HR_{adj} [black]: 1.53, 95% CI: 1.12-2.09 for comorbidity score ≥2 vs.0). Among white patients, women had significantly better survival (HR_{adj}: 0.81, 95% CI: 0.77-0.85), but not so among black patients (HR_{adj}: 0.95, 95% CI: 0.74-1.21). Both groups derived benefit from radiotherapy (HR_{adj} [white]: 0.84, 95% CI: 0.75-0.94; HR_{adj} [black]: 0.41, 95% CI: 0.21-0.82) and chemotherapy (HR_{adj} [white]: 0.67, 95% CI: 0.64-0.70; HR_{adj} [black]: 0.75, 95% CI: 0.60-0.94); only white patients had significantly better OS with surgery (HR_{adj} [white]: 0.78, 95% CI: 0.74-0.83; HR_{adj} [black]: 1.06, 95% CI: 0.76-1.48). Conclusion: Prognostic factors associated with better OS vary by race. Some of these differences may reflect poorer access to quality healthcare among black patients and compounded socioeconomic effects. Differences in previous asbestos exposure with race could also play a role in the biology of the disease. Further work is needed to untangle these differences to determine best care practices and improve prognosis for all patients.

B097, PR04 Understanding outcome disparities in multiple myeloma: A multiethnic comparison of clinical characteristics in Hispanics. [Alem A. Belachew](#), Xiaohui Tang, Lily K. Sandblom, Luis A. Acevedo-Soto, Robert Z. Orłowski, Elisabet E. Manasanch, Michelle A.T. Hildebrandt. MD Anderson Cancer Center, Houston, TX, USA.

Purpose: Although Hispanics are the fastest growing minority population in the United States, little is known regarding clinical attributes of Multiple Myeloma (MM) in this group. Here, we ascertain unique MM disease characteristics in Hispanics when compared to a multi-ethnic MM patient population. Methods: Self-reported 152 Hispanic, 219 non-Hispanic black (NHB) and 275 non-Hispanic white (NHW) MM cases were selected from the MD Anderson Cancer Center Patient and Survivor Cohort. Patient demographics, history of pre-malignancy, MM (Ig) subtypes, baseline diagnostic and prognostic indicators were then abstracted for each patient. Comparative cross-ethnic analysis was conducted using chi-squared tests and student t-tests as appropriate for categorical and continuous variables. Overall survival was determined from date of death or last date of follow up and Kaplan-Meier curves were utilized to visualize outcome by ethnic group. Results: Hispanic MM cases were significantly younger (57.0) compared to NHW cases (62.1; P=0.003) and similar to NHB cases (57.4; P=0.77). IgG comprised the majority (54.3%) of MM subtypes in Hispanic patients followed by IgA (24.5%) and light chain restricted

(11.9%). Hispanics had the least incidence of premalignant MGUS and smoldering myeloma (8.50%) compared to NHB (21.9%; P=0.0006) and NHW patients (13.8%; P=0.12). Cross-ethnic assessment of baseline blood biomarkers revealed a significant difference in median beta-2-microglobulin levels between the Hispanic (4.60) and NHB (3.30) cases (P=0.03). In addition, baseline median hemoglobin levels in Hispanics (11.2) were significantly higher from that in NHB cases (10.0; P=0.0001) but were similar to NHW patients (11.2). Furthermore, the median M spike at diagnosis was significantly lower in Hispanics (2.45) compared to both NHW (3.4) and NHB (3.4) study groups (P=0.011 for both). Interestingly, the median overall survival time for Hispanic patients (63.9 months) was 15 months longer than NHB (48.8 months; log-rank P=0.10) and over 21 months longer than NHW MM patients (42.4 months; log-rank P=0.016). Conclusion: We identified distinct clinical features in Hispanic MM patients that differed from NHW and NHB cases. Findings of our study may provide a better understanding for cancer diagnosis and management in the Hispanic populations. Ongoing efforts include assessing differences by genetic ancestry to refine clinical characterization among this highly admixed population.

B098 Intra-Caribbean Island differences drive breast cancer outcomes in US Caribbean-immigrant women compared to US-born Black women. [Danielle A Cerbon](#)¹, Matthew Schlumbrecht², Camille Ragin³, Priscila Barreto-Coelho⁴, Judith Hurley¹, Sophia HL George². ¹Department of Medicine, Division of Medical Oncology, Miller School of Medicine, University of Miami, Miami, FL, USA, ²Department of Obstetrics and Gynecology, Division of Gynecology Oncology, Miller School of Medicine, University of Miami, Miami, FL, USA, ³Fox Chase Cancer Center, Philadelphia, PA, USA, ⁴Department of Internal Medicine, University of Miami/Jackson Memorial Hospital, Miami, FL, USA.

Introduction The Caribbean accounts for half of all foreign-born blacks in the USA. The biggest contributors to this immigrant population come from Cuba, Dominican Republic (DR), Jamaica, Haiti and Trinidad and Tobago. Breast cancer (BC) is the most commonly diagnosed cancer in US Black women and the second cancer related cause of death. Breast cancer in the most common cause of death of native Caribbean women. In our previous work, we found that Caribbean immigrants with breast had a better overall survival than US born Blacks. The primary objective of this study was to investigate the etiology and outcomes within the most populace Caribbean born immigrants compared to US born Black women within our cohort. Methods Data were obtained

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from Jackson Memorial Health Systems and University of Miami Health System Tumor Registry. Data from 1,082 Black patients were used to estimate hazard ratios (HRs) of women born in Haiti, Jamaica, Bahamas, Cuba, Dominican Republic or the US born (USB) using Cox proportional hazards regression analysis for overall survival. Clinicopathologic and treatment characteristics of women from each island were compared to USB using Chi Squared testing and independent sample t-test. Results The sub-cohort contained data from Haitian (250), Jamaican (89), Bahamian (43), Dominican (38), Cuban (38) and 624 USB women. Compared to USB (57.6 years), of all the sub-groups the Bahamians were the youngest (50.5 years, $P < 0.001$) and presented at the highest advanced stage in the cohort (54.3% vs USB 35.3%; $P = 0.02$). Cubans (26.5%), Jamaicans (26.2%), and Haitians (25.8%) had a higher prevalence of HER2+ breast cancer in contrast to USB (17.7%), Bahamians (18.9%) and Dominicans (18.9%). Surgery was a favorable factor for survival in USB (aHR=0.26 (0.19-0.36), $p < 0.001$), Bahamians (aHR=0.05 (0.01-0.47), $p = 0.008$) and Jamaicans (aHR=0.08 (0.03-0.24), $p < 0.001$). Haitian were the only immigrant group with a significant favorable outcome from radiation therapy (aHR=0.45, 95% CI: 0.27-0.77; $P = 0.004$). Cubans and Dominicans had a significant favorable response to surgery (aHR=0.25 (0.04-1.58), $p = 0.14$) and radiation (aHR=0.48 (0.05-4.19), $p = 0.51$) but did not reach statistical significance due to small sample size. Conclusion This data demonstrates and highlights intra-island and ethnic differences linked to clinicopathologic features of breast cancer in Black women living in the US. Further studies are needed to identify biological factors impacting the etiology and outcomes breast cancer in the immigrant Caribbean population and US born Black.

B099 Rural black cases have worsened outcomes in head and neck cancer. Jacob A Clarke¹, Alyssa M Despotis², Jose P Zevallos¹, Angela L Mazul¹. ¹Washington University School of Medicine, St. Louis, MO, USA, ²Washington University, St. Louis, MO, USA.

Background: Racial and socioeconomic disparities in head and neck cancer survival are well documented. However, rural-urban context, especially the interaction between race and rural-urban context, is understudied. The aim of this study is to examine the relationship between race and rural-urban context in HNC survival and determine factors that potentially drive this disparity.

Methods: We constructed a retrospective cohort of 158,718 head and neck squamous cell cases from the National Cancer Database with the following sites: hypopharynx (9.54%), larynx (54.42%), and oral cavity (36.04%). Since we are

interested in traditional head and neck cancer, oropharyngeal cases were excluded from the cohort. We used Rural-Urban Continuum Codes (RUCC) to classify cases into metro (RUCC 1-3) and non-metro subgroups (RUCC 4- 9). Risk factors were classified into demographic (age and gender), socioeconomic (insurance status), and clinical factors (site, stage, and treatment modality). Kaplan-Meier survival curves and the Cox proportional hazards regression were used to calculate adjusted hazard ratios (HR). The proportional hazards and linearity assumptions were tested and satisfied.

Results: The exposure cohorts that were analyzed include black metro (N = 17,256; 10.87%), black non-metro (N = 2,501; 1.57%), white metro (N = 109,842; 69.21%), and white non-metro cases (N = 29,119; 18.35%). Rural-urban five-year survival differences are larger between black non-metro cases (39.32%; 95% Confidence Interval (CI): 37.21-41.56%) and black metro cases (43.97%; 95% CI: 43.15-44.81%) compared with white non-metro cases (50.32%; 95% CI: 49.68-50.99%) and white metro cases (53.12%; 95% CI: 52.79-53.45%). In the univariable Cox proportional hazards analysis, compared with white metro cases, black non-metro cases have the worst survival (HR: 1.44; 95% CI: 1.36-1.15; $p < .001$) followed by black metro cases (HR: 1.28; 95% CI: 1.26-1.31; $p < .001$) and white non-metro cases (HR: 1.0, 95% CI: 1.06-1.10; $p < .001$). Interestingly, there is no interaction between race and rural-urban context ($p = 0.18$). After conducting a multivariable analysis controlling for demographic, socioeconomic, and clinical factors, the HRs were attenuated, but black non-metro cases continue to have worse survival compared with white metro cases.

Conclusion: Although there is no interaction between rural-urban context and race, black HNC cases, specifically those living in non-metro areas, have worse survival. This disparity still remains after adjusting for insurance status, site, and stage. Further research should be conducted to determine other modifiable risk factors to mitigate this racial and geospatial disparity.

B100 Developing an integrated understanding of access to care and tumor characteristics patterns by race and age in the Carolina Breast Cancer Study Phase III, 2008 – 2013. Marc A Emerson, Yvonne M Golightly, Xianming Tan, Allison E Aiello, Katherine E Reeder-Hayes, Andrew F Olshan, Shelley A Earp, Melissa Troester. University of North Carolina at Chapel Hill, Chapel Hill, NC, USA.

Purpose: Understanding breast cancer mortality disparities by race and age is complex due to disease heterogeneity, comorbid disease, and the range of factors influencing

access to care. We compared socioeconomic status (SES) and comorbidity factors from the Carolina Breast Cancer Study Phase III (CBCS3, 2008-2013) to North Carolina and examined factors related to race and age in CBCS. Methods: Distributions of SES and comorbidity factors in CBCS3 cases were compared to those of North Carolina women in the 2010 Behavioral Risk Factor Surveillance Study. Using latent class analysis of CBCS3 data, we identified covariate patterns by SES/comorbidities, barriers to care, and tumor characteristics and examined their associations with race and age using multinomial logistic regression. Results: Major SES and comorbidity patterns in CBCS3 participants were generally similar to patterns in the state. Latent classes were identified for SES/comorbidities, barriers to care, and tumor characteristics that varied by race and age. Compared to white women, black women had lower SES (odds ratio (OR)=6.3, 95% confidence interval (CI); 5.2, 7.8), more barriers to care (OR=5.6, 95% CI; 3.9, 8.1) and several aggregated tumor aggressiveness features. Compared to older women, younger women had higher SES (OR=0.5, 95% CI; 0.4, 0.6), more barriers to care (OR=2.1, 95% CI; 1.6, 2.9) and aggregated tumor aggressiveness features. Conclusions: CBCS3 is representative of North Carolina on comparable factors. Patterns of access to care and tumor characteristics are intertwined with race and age, suggesting that interventions to address disparities will need to target both access and biology.

B101 Race is associated with receipt of guideline-concordant treatment among women with endometrioid endometrial cancer: A National Cancer Database study.

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Background: Among women with endometrial cancer (EC), African American women have a 93% higher likelihood of dying compared to white women. This disparity is driven, in part, by the more frequent diagnosis of late stage and non-endometrioid tumors among African American women. However, even among women diagnosed with indolent forms of EC, including early stage or endometrioid histology, African American women are more likely to die. Differential receipt of guideline-based treatment might underlie worse survival among African American women. EC treatment guidelines are based on several randomized clinical trials,

which provide consistently strong evidence on treatment regimens for women with early stage, endometrioid EC. Using the National Cancer Database (NCDB), we assessed the hypothesis that among women with less aggressive forms of EC, minority women would have lower odds of receiving guideline-concordant treatment than white women. In addition, we examined whether a survival benefit exists for EC patients who receive guideline-concordant treatment. Methods: We defined receipt of guideline-concordant EC treatment using the National Comprehensive Cancer Network (NCCN) guidelines, which stratify treatment decisions based on tumor characteristics. We used multivariable logistic regression models to compute odds ratios (OR) and 95% confidence intervals (CIs) for the association between race, categorized as non-Hispanic white (NHW), non-Hispanic black (NHB), Hispanic, and Asian/Pacific Islander (API), and receipt of guideline-concordant treatment. We used multivariable Cox proportional hazards regression models to estimate hazards ratios (HRs) and 95% CIs for relationships between receipt of guideline-concordant treatment and overall survival. Results: A total of 89,976 women diagnosed with stages 1A through 3C, endometrioid EC between the years 2004 and 2014 were included, among whom, 71.5% (n=64,316) received treatment in line with NCCN guidelines. In multivariable adjusted models, NHB (OR=0.91, 95% CI=0.86 – 0.97) and Hispanic women (OR=0.93, 95% CI=0.86 – 0.99) had lower odds of receiving concordant treatment compared to NHW women. Receipt of guideline-concordant treatment did not differ between API and NHW women. During the study period, NHB women had the highest proportion of deaths (28.7%) followed by NHW (22.0%), Hispanic (16.0%), and API women (14.2%). In models adjusted for patient, clinical, and facility characteristics, women not receiving guideline-concordant care were 8% more likely to die (HR=1.08, 95% CI=1.05 – 1.12). Conclusions: Receipt of guideline-concordant treatment differed according to race, with minorities less likely than NHW women to receive guideline-directed therapy. Further, in the overall study population, overall survival was better among those receiving guideline-concordant care. Future studies should evaluate reasons underlying disparate EC treatment.

B102 Body mass index, physical activity, and breast cancer subtype in European American, African American, and Sea Island breast cancer survivors.

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BACKGROUND: Breast cancer (BCa) is the second leading cause of cancer death among women in the United States and large racial/ethnic disparities are evident. Higher levels of body mass index (BMI), lower rates of physical activity (PA), and hormone receptor-negative BCa sub-type are associated with poorer BCa treatment outcomes. **PURPOSE:** To evaluate the prevalence of high BMI, low PA level, and BCa sub-type among three BCa survivor groups: European Americans (EAs), African Americans without Sea Island ancestry (AAs), and AAs with SI ancestry (SIs). **METHODS:** A state central cancer registry database was used to identify 137 (42 EAs, 66 AAs, and 29 SIs) women diagnosed with BCa between May 2012 and October 2013, who were within 6-21 months of diagnosis at the time of the study. **RESULTS:** Regardless of racial/ethnic group, most participants (82%) were overweight/obese ($p=0.46$). BMI was highest in younger AAs ($p=0.02$). The CDC PA guidelines (≥ 150 minutes/week) were met by only 28% of participants. In terms of BCa sub-type, among the 86 participants who provided saliva samples, the frequency of triple-negative BCa and estrogen-receptor-negative BCa was lower in EAs and SIs than in AAs ($p < 0.05$). **CONCLUSIONS:** This is the first study to identify differences in obesity rates, PA rates, and BCa sub-type in EAs, AAs, and SIs. Future research could explore dietary and PA behavioral interventions to reduce BCa recurrence risk, and could evaluate potential differential immune responses linked to the frequency of triple-negative BCa in AAs.

B103 Racial and geographic disparities in stage of presentation in the colorectal cancer hotspot region of North Carolina. Tyler Hinshaw¹, Suzanne Lea¹, Justin Arcury², Alexander A Parikh¹, Rebecca A Snyder¹. ¹East Carolina University Brody School of Medicine, Greenville, NC, USA, ²North Carolina Central Cancer Registry, Raleigh, NC, USA.

Background: Despite improvements in colorectal cancer (CRC) screening, treatment, and long-term outcomes,

recent epidemiological studies have demonstrated that geographic disparities in CRC persist. Spatial mapping has identified distinct hotspots of increased CRC death rates, including 11 rural counties in eastern North Carolina (NC). The primary aim of this study was to (1) measure CRC incidence by stage in the NC hotspot and non-hotspot regions, and (2) determine if racial disparities exist in stage-stratified incidence and overall mortality rates by geographic region. **Methods:** CRC diagnosis and death data from 2008-2016 were obtained from the NC Central Cancer Registry and analyzed by hotspot and non-hotspot regions by summary cancer stage at diagnosis and race. The non-hotspot region was defined as 71 NC counties outside of eastern NC. Death rates (95% CI) were expressed per 100,000 person-years and age-adjusted to the 2000 U.S. standard population. Regional rates were calculated for the 8-year interval. **Results:** Within the hotspot region in eastern NC, the overall incidence rate of CRC is higher than non-hotspot NC [43.7 (95% CI 39.2-48.8) vs 38.4 (95% CI 37.6-39.2)]. Within the hotspot counties, overall incidence rates are higher among African American (AA) compared to White patients [51.1 (95% CI 43.4-59.9) vs. 39.1 (95% CI 33.6-45.4)], and this disparity persists across all stage categories. The incidence among AA and White patients with localized disease is 18.4 and 14.4, respectively; for regional disease, 16.7 vs. 13.9; and for distant disease, 11.4 and 7.8. Similar racial disparities in CRC incidence are also observed within the non-hotspot counties (localized 16.1 vs. 13.5, regional 15.2 vs. 13.5, and distant 11.3 vs. 7.8). CRC mortality rates in the hotspot counties are higher among both AA and White patients (21.7 and 15.5, respectively) compared to non-hotspot NC (19.1 and 12.8, respectively), although the absolute difference by race is similar (6.2 vs. 6.3, respectively). **Conclusions:** Patients residing within the 11 rural hotspot counties in NC have higher age-adjusted incidence of localized, regional, and distant CRC and higher mortality rates than patients in non-hotspot counties. Noteworthy racial disparities exist in both stage at presentation and mortality rates; however, absolute racial disparities appear similar in both geographic regions. Future work should investigate the underlying etiology for both increased CRC incidence and mortality among AA and White patients in the NC hotspot counties.

B104, PR03 Disaggregation of gastric cancer risk between Asian American subgroups. Robert J Huang¹, Joo Ha Hwang², Ann Hsing³, Latha Palaniappan². ¹Stanford University School of Medicine, Stanford, CA, USA, ²Stanford University School of Medicine, Stanford, CA, USA, ³Stanford Cancer Institute, Stanford, CA, USA.

Introduction Within the United States (US), Asian/Pacific

Islanders (APIs) are at increased risk for non-cardia gastric adenocarcinoma (NCGA) compared to non-Hispanic whites (NHWs). Previous epidemiologic research has treated APIs as an aggregated group for analysis; however, substantial genetic and environmental differences may exist within subgroups. Very limited data exist regarding gastric cancer epidemiology as stratified by API subgroup. Methods All incident cases of NCGA diagnosed in the years 2000-2014 were identified from the Surveillance, Epidemiology, and End Results Program registries incorporating California, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Atlanta, and New Jersey. API subgroup of patients were identified: Korean, Japanese, Chinese, Vietnamese, Filipino, and Indian. API subgroup population estimates were obtained from the American Community Survey. The age-adjusted incidence rates per 100,000 population and 95% confidence intervals (CIs) were generated for each subgroup, and among non-Hispanic whites (NHWs) for reference. The stage of diagnosis (as defined by National Cancer Institute summary stage) were compared between subgroups. Differences between subgroups in all-cause mortality following diagnosis were evaluated utilizing proportional hazards (PH) regression, adjusting for differences in tumor stage, age, and gender. Results There exist substantial differences in age-adjusted incidences of NCGA between subgroups: Koreans (34.8 per 100K), Japanese (17.0 per 100K), Vietnamese (14.6 per 100K), Chinese (11.2 per 100K), Indian (5.4 per 100K), and Filipino (5.3 per 100K). The incidence among NHWs was 3.8 per 100K. All API subgroups as well as NHWs demonstrated a decrease in age-standardized incidence over the study period. There exist differences in the proportion of cancers diagnosed at local stage: Koreans (37.8%), Japanese (28.1%), Chinese (25.7%), Vietnamese (24.4%), Indian (21.6%), Filipino (18.9%), and NHWs (23.7%). API subgroups had better overall survival from NCGA compared to NHWs (reference) in PH regression: Korean (HR 0.50, CI 0.47-0.54, $p < 0.001$), Japanese (HR 0.79, CI 0.74-0.85, $p < 0.001$), Vietnamese (HR 0.79, CI 0.72-0.87, $p < 0.001$), Chinese (HR 0.70, CI 0.65-0.74, $p < 0.001$), and Indian (HR 0.69, CI 0.58-0.81, $p < 0.001$). These differences remained significant even after adjustment for stage of diagnosis, age, and gender. Discussion Substantial heterogeneity in risk for NCGA exist between API subgroups. Koreans Americans are at highest risk, with incidence nearly seven-fold higher than Filipinos and Indians (whose risk is similar to NHW). This suggests that the higher NCGA-risk in APIs in aggregate are driven by certain subgroups. Interestingly, Koreans, Japanese, Vietnamese, Chinese, and Indians all had better survival following NCGA diagnosis than NHWs, even after adjustment for stage of diagnosis. These epidemiologic data may hold important implications for gastric cancer screening or surveillance programs.

B105 The impact of ancestry on mutational and immune signatures in triple-negative breast cancers. [Raymond W. Hughley](#)¹, Clayton Yates², Paz Polak¹. ¹Mount Sinai, New York, New York, USA, ²Tuskegee University, Tuskegee, Alabama, USA.

Background: Oncologist found that Androgen Receptor (AR) therapies work in 10% of Triple Negative Breast Cancer (TNBC) patients. Recently we published that women with AR- TNBC, Quadruple Negative Breast Cancer (QNBC), have an Immune basal Signature that's particularly prevalent in AA women. AA women at a similar mean age of incidence as QNBC AA (47) have increased chances of methylation as a Homologous Recombination Deficiency (HRD) compared to white women. For this reason, we explored QNBC patients to see what correlation may exist between AR, ancestry, immune signatures, and HRD. Methods: We analyzed mRNA expression and HRD events in 987 tumors from The Cancer Genome Atlas. Samples were dichotomized as AR positive or negative using mean gene expression cutoff. Global Ancestry was calculated using Structure. Immune signatures were obtained from TIMER. Mutational Signatures were determined from COSMIC. Linear regression models, forest plots, and Correlation Plots were made using R packages. Pathway analysis was done using the Hallmarks geneset in GSEA and Pathway Studio. Results: Our analysis found significant upregulation of PD-1 ($p = 0.001$), PD-L1 ($p = 0.037$), and CTLA-4 ($p < 0.0001$) in QNBC vs non-QNBC patients, as well as upregulated PD-1 ($p = 0.017$), PD-L1 ($p = 0.011$), and CTLA-4 ($p = 0.0114$) in AA QNBC vs CA QNBC using linear regression models adjusted for age and stage. We also found an upregulation in TH-1 ($p < 0.0001$) and TH-17 ($p < 0.0001$) differentiation pathways in AA QNBC patients compared to CA QNBC patients found through pathway studio. We also observed that of the 20 AA patients that had an HRD only 2 were mutations while the other 18 were caused by Epigenetic Silencing. We found that West African global ancestry is associated with lower expression of BRCA1 ($p = 0.0113$), BRCA2 ($p < 0.001$), RAD51C ($p = 0.0208$) and, PALB2 ($p < 0.001$). We also found that within QNBC patients European global ancestry was inversely associated with the APOBEC mutational signature ($p = 0.027$) and West African global ancestry was inversely associated with the "Aging" mutational signature ($p = 0.0256$). There was no significant association with global ancestry and the HRD signature. Conclusion: The use of AR as a biomarker may lead to better diagnosis of aggressiveness for breast cancer patients especially for AA women and women with TNBC. QNBC patients may be receptive to immune therapies in particular patients of African Ancestry. Most patients with HRD are likely to be QNBC. West African global ancestry

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was associated with lower levels of the Aging signature and European global ancestry was associated with lower levels of APOBEC mutational Signature. Also, Women of African Ancestry are more likely to have epigenetically silenced DNA repair mechanism compared to Mutations in it while women of European descent have similar chances of having both. Despite this neither groups global ancestry had a significant association with the HRD mutation signature. Further research is needed to determine the impact of local ancestry on the HRD signature.

B106 Racial/ethnic disparities in risk of breast cancer mortality by molecular subtype and stage at diagnosis.

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Background: Previous research has found significant survival disparities between African-American and white women among select stages and subtypes of breast cancer, however other racial/ethnic groups have been less well-studied. This study expands on previous research, examining differences in breast cancer-specific mortality across multiple racial and ethnic groups. Methods: Women diagnosed with a first primary invasive breast cancer between 2010 and 2016 who were between 20 and 85 years of age at diagnosis were identified in the SEER database. Subtypes were defined by joint hormone receptor (HR) and human epidermal growth factor receptor 2 (HER2) status. Cox proportional hazards models for each stage and subtype were fit, with non-Hispanic white women as the reference group. Effect modification by age at diagnosis (<50, ≥50) was found, so models additionally including an interaction term for binary age at diagnosis, with a linear age term for the main effect, were fit. Four different models were fit to adjust for different sets of confounders, adding in additional covariates with each model. Results: After multivariable adjustment, younger African American women had greater risks of breast cancer-specific death for all stages of HR+/HER2-, stages II-IV of HR+/HER2+, stage III TN breast cancer, and stage I and IV of HR-/HER2+ breast cancer. Asian/Pacific Islander women generally had a lower hazard of breast cancer-specific death. Older Hispanic white women had a lower hazard of breast cancer-specific death for stages I-III HR+/HER2- and stage II TN breast cancer. Generally, insurance status explained in part the observed disparities; however, many of the observed disparities were still statistically significant after adjustment for tumor grade, treatment characteristics, and insurance status. Conclusions: These findings demonstrate that different racial/ethnic groups experience different risks

of breast cancer-specific mortality by stage and subtype. By considering different models adjusting for different factors we were able to observe the extent to which these factors account for initially observed disparities. Insurance status, as a proxy for other health care and socioeconomic factors, may drive some of the observed differences in mortality; however, other factors, such as hormonal treatment or obesity, may be responsible for the remaining disparities. Efforts to address survival disparities should place additional focus on young African American women, as they experience meaningful disparities in breast cancer-specific mortality, particularly for HR+ subtypes.

B107 Race-specific gene expression patterns in triple-negative breast cancer (TNBC) cases.

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Historically, incidence rates of breast cancer (BC) have been higher among Caucasian (CA) women compared to African-American (AA) women, until convergence of these rates in the mid 2000s. Conversely, when accessing mortality rates among these women, AA women have reported higher rates of mortality from BC since the mid 1980s. Despite a decline in BC mortality over the past 30 years, the mortality rate of disease among AA women remains to be significantly higher than that of their CA counterparts. When molecular subtypes of BC are considered, prevalence of Triple-Negative BC (TNBC), the most aggressive subtype of BC, is found to be higher among AA women. TNBC prevalence on the global scale shows highest levels of TNBC across Africa, and higher rates can also be observed across the African diaspora. To address this, we sought out to identify race-specific differences among TNBC cases. We completed RNA sequencing on a cohort of 75 cases, where 42 of the cases were AA, and 33 were CA. The dataset was dichotomized by if the individuals had received neoadjuvant chemotherapy prior to surgery and specimen collection, where we had 60 treatment naïve cases (31 AAs and 29 CAs) and the remaining 15 had received neoadjuvant chemotherapy (residual tumors; 11 AAs and 4 CAs). We assessed self-reported race, ancestry estimation from matched DNA samples into and TNBC molecular subtyping from matched DNA samples into our DE gene expression analyses. Among treatment naïve tumors, we identified over 1000 genes that were significantly differentially expressed (DE) between race groups ($p < 0.05$). To further analyze our race-specific gene set, we used

Ingenuity Pathway Analysis (IPA) to investigate relevant pathways and regulators specific to our gene set. Using the causal network analysis, we see that biological functions such as cellular organization and assembly show significant enrichment in our gene set, and that the NFkB complex is a top regulator predicted to be activated in our AA treatment naïve cases compared to CAs. For those individuals who had received neoadjuvant chemotherapy, we identified 13 genes that are significantly different between race groups, and these DE genes are distinct from those identified in our treatment naïve analyses.

B108 Disparities in clinical and demographic characteristics among Asian/Pacific Islander and non-Hispanic White newly diagnosed lung cancer patients. [Parth Bhargav Patel](#), Naomi Alpert, Raja Flores, Emanuela Taioli. Icahn School of Medicine at Mount Sinai, New York, NY, USA.

Purpose: Racial disparities persist among patients with lung cancer (LC), and are well documented among Non-Hispanic Whites (NHW), Blacks, and Hispanics. However they have not been adequately studied among the ethnic subgroups of Asian/Pacific Islanders (API). API populations are heterogeneous in many ways, including country of origin, cultural diversity, health behaviors, and health outcomes, but they are often treated as a single group. The goal of this study is to compare the clinical and demographic characteristics at LC diagnosis between API subgroups and NHW patients.

Methods: NHW and API patients aged ≥ 18 years diagnosed with malignant LC from 1990 to 2015 were identified from the Surveillance, Epidemiology, and End Results (SEER) Program. API population was divided into 8 ethnic subgroups (ES): Filipino, Chinese, Japanese, Asian Indian/Pakistani, Korean, Vietnamese, Hawaiian/Pacific Islander, and Other. Multivariable logistic regression and multinomial logistic regression models with NHW as the reference were used to estimate odds ratios (OR) and 95% confidence intervals (CI) to assess independent associations of LC patient clinical and demographic factors with API and ES.

Results: There were 522,702 NHW and 41,479 API LC patients. API was significantly younger (OR_{adj} : 0.53, 95% CI: 0.49-0.58 for ≥ 80 vs. ≤ 39 years) than NHW, with differences according to ES (range of effects: OR_{adj} [Asian Indian/Pakistani]: 0.10, 95% CI: 0.07-0.14; OR_{adj} [Japanese]: 2.73, 95% CI: 1.91-3.92). API patients and ES subgroups were less likely to be female (OR_{adj} : 0.84, 95% CI: 0.83-0.86); API patients were less likely to be never married (OR_{adj} : 0.71, 95% CI: 0.69-0.74), and so was for ES except for Hawaiian/Pacific

Islanders, who were more likely to be never married (OR_{adj} : 1.15, 95% CI: 1.05-1.27). API were more likely to be diagnosed at a later stage (OR_{adj} : 1.31, 95% CI: 1.27-1.35 for stage IV vs. stage I); this was similar across ES. API patients were significantly less likely to be diagnosed with a squamous cell carcinoma (OR_{adj} : 0.54, 95% CI: 0.52-0.55, compared to adenocarcinoma); effects ranged from OR_{adj} [Vietnamese]: 0.37, 95% CI: 0.33-0.41 to OR_{adj} [Hawaiian/Pacific Islander]: 0.89, 95% CI: 0.82-0.97.

Conclusion: At diagnosis, significant disparities in demographic and clinical characteristics exist between NHW and API patients overall, as well as across the eight major API ethnic subgroups. These findings indicate that treating API patients as a single population may miss crucial biological, environmental and behavioral differences. It may be beneficial to view these subgroups separately when developing strategies for prevention and efficacious treatment.

B109 Hispanics have improved overall survival with pancreatic ductal adenocarcinoma regardless of treatment facility. [Andrea N Riner](#), Patrick Underwood, Kai Yang, Srikar Chamala, Peihua Qiu, Jose G Trevino. University of Florida, Gainesville, FL, USA.

Introduction: Disparities exist in patients with pancreatic ductal adenocarcinoma (PDAC). Historically, minority populations including mostly black race is regarded as a negative predictor of receiving expected treatment for clinical stage and overall survival. While better clinical outcomes are suggested at Academic Programs for minority populations, the differentiation amongst Hispanic populations or treatment facility types is unknown. We hypothesized that outcomes among racial/ethnic PDAC patients are influenced by facility type where care is received. Methods: Patients diagnosed with PDAC (2004 to 2015) were identified through the National Cancer Data Base (NCDB). 170,466 patients were included in the analysis. Cox proportional hazard model was used to compare survival between race/ethnic groups (Non-Hispanic Whites, Non-Hispanic Blacks, Hispanics) across facility types, while adjusting for sex, age, median income, insurance, urban vs rural, Charlson-Deyo score, stage, and surgical resection. Median survival times and estimated survival curves were based on the fitted Cox model. The facility types were identified as Community Cancer Program (CCP), Comprehensive Community Cancer Program (CCCP), Academic Research Program (ARP) and Integrated Network Cancer Program (INCP). Results: Compared to Non-Hispanic Whites (NHW), Non-Hispanic Blacks (NHB) have worse overall survival (HR = 1.05, $p < 0.001$) and Hispanics have

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better overall survival (HR = 0.92, $p < 0.001$) among all facility types. After controlling for socioeconomic and clinical covariates, NHB have better overall survival compared to NHW (HR = 0.95, $p < 0.001$), while again Hispanics have the best comparative outcomes (HR = 0.83, $p < 0.001$). Although this effect is significant among all facility types for Hispanics, the improved survival is most pronounced at ARPs (HR 0.78, $p < 0.001$) and INCPs (HR 0.77, $p < 0.001$). The improved survival of NHB over NHW is seen at CCCP (HR 0.97, $p = 0.025$) and ARP (HR 0.96, $p = 0.003$), and this is influenced mostly by wealth and surgical resection. Additionally, each race/ethnic group has a median survival benefit at ARPs (NHW = 9.26 months, NHB = 7.69 months, Hispanics = 9.07 months), whereas median survival was most reduced at CCPs (NHW = 4.93 months, NHB = 4.57 months, Hispanics = 6.14 months). Median survival in Hispanics was also improved at INCPs (8.38 months). Conclusion: Overall and median survival are improved at ARP for all races/ethnicities. Hispanics have better overall survival comparatively, at all programs. However, the survival benefit of Hispanics is greater at ARPs and INCPs. Non-Hispanic Blacks have worse overall survival, but when survival is adjusted for higher income and surgical resection, NHB have better overall survival than NHW at higher volume centers. Further research is needed to determine why survival among Hispanics differs disproportionately across facility types (tumor biology) and to understand the impact of income and surgery on significantly improved survival in NHB.

B110 Racial disparities in pancreatic adenocarcinoma survival. Do they exist for patients who already survived their first year? [Anas M Saad](#)¹, Maha AT Elsebaie², Mohamed Amgad³, Muneer J Al-Husseini⁴, [Kyrrillus S Shohdy](#)⁵, Omar Abdel-Rahman⁶. ¹Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, OH, USA, ²Faculty of Medicine, Ain Shams University, Cairo, Egypt, ³Department of Biomedical Informatics, Emory University School of Medicine, Atlanta, GA, USA, ⁴Department of Medicine, Ascension St John Hospital, Detroit, MI, USA, ⁵Division of Hematology and Medical Oncology, Department of Medicine, Weill Cornell Medical College, New York, NY, USA, ⁶Department of Oncology, University of Alberta and Cross Cancer Institute, Edmonton, Alberta, Canada.

Purpose: Population-based studies indicated that prognosis of pancreatic adenocarcinoma (PAC) is worse in black patients compared to other races. Nonetheless, survival probabilities can change over time based on number of years (yr.) already survived by patients; a concept called conditional survival. This study explored the dynamic

changes in risk according to patient characteristics, particularly race, on survival of PAC patients using cancer-specific survival (CSS) estimates. Methods: The Surveillance, Epidemiology, and End Results (SEER) database was queried for data on adult patients with non-metastatic PAC, diagnosed between 1988 and 2010. Patient characteristics, such as age, race, tumor grade, and stage were collected at the time of diagnosis. CSS probabilities, as well as Cox proportional hazard ratios (HRs), were computed at the time of diagnosis (Actuarial CSS and baseline HR), and after already surviving 1 to 6 yr. after diagnosis (Conditional CSS and HR). Harrell's concordance index (C-index) was used to measure the cross-validation accuracy of the Cox models. Results: Our search retrieved data on 20,491 patients, with a mean age at diagnosis of 67.2 yr. Most of the patients were White (81.6%), followed by Black (12%) and Asians/Pacific Islander (6.4%). The stage was T1-2NOMO in 15.9%, T3-4NOMO in 41.8%, and T1-4N1M0 in 42.3% of patients. The 3-yr actuarial CSS calculated from time of diagnosis was significantly different across racial groups, at 11%, 10%, and 13% for Whites, Blacks, and Asians, respectively ($P < 0.01$). Conversely, for patients who already survived 1 yr. after diagnosis, the probability of surviving an additional 2 yr. was similar across races, at 26.2%, 27.1%, and 29.9%, for Whites, Blacks, and Asians, respectively ($P = 0.218$). As patients survived for longer periods of time following diagnosis, conditional CSS estimates increased similarly across different races; for White, Black, and Asian patients who already survived 3 yr. after diagnosis, the probability of surviving an additional 2 yr. was 62.6%, 60.5%, and 62.1%, respectively ($P = 0.532$). In multivariate cox models, the prognostic effect of race lost significance if patients already survived ≥ 1 yr. after diagnosis (Baseline HR = 1.114, 95%CI [1.045- 1.187], mean C-index = 67%; conditional HR at 1 yr = 1.015, 95%CI [0.919- 1.12], mean C-index = 60%). The prognostic effect of tumor grade, site, and age lost significance if patients already survived ≥ 2 , ≥ 4 , and ≥ 6 yr. after diagnosis, respectively. Tumor stage maintained its prognostic significance over time (conditional HR at 6 yr = 1.522, 95%CI [1.049- 2.208], mean C-index = 59%). Conclusion: Racial disparities in survival outcomes exist at the time of diagnosis for PAC patients. However, the survival impact of these disparities does not seem to persist over time. Other variables, such as age, tumor grade, stage, and treatment received should be taken into account when predicting future prognosis of PAC patients who have already survived ≥ 1 yr. after diagnosis.

B111 Integrated molecular approach to identify biologic factors contributing to breast cancer disparities in Chicago.

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African American (AA) women have much higher risk of death from estrogen receptor positive (ER+) breast cancer than non-Hispanic white (Caucasian) women even though these racial groups have same incidence rates. The aim of this study is to explore whether there are racial differences in biological mechanisms that drive ER+ breast cancer and if they might be linked to a higher rate of metastasis and resistance to endocrine therapy. Eligible cases -AA and white women, aged 20-79, with a new diagnosis of stage I-III ER+ breast cancer- were recruited from 3 cancer institutions in Chicago. Control subjects -AA and white women presenting for a screening mammogram without breast symptoms and no history of cancer- have been recruited from the corresponding mammography centers. Serum was collected from AA and white cases and controls in order to conduct a metabolomics and proteomics analysis to identify oncometabolites that might promote aggressive phenotypes in ER/PR breast cancer cells. A follow up on previously established protocol and results from a total of new 266 subjects will be presented.

B112 Racial/ethnic differences in hepatocellular carcinoma (HCC) characteristics and outcomes: The Multiethnic Cohort.

Afsaneh Barzi, Songren Wang, Veronica Wendy Setiawan. University of Southern California, Los Angeles, CA, USA.

Backgrounds: Striking differences in HCC incidence rates have been observed in the Multiethnic Cohort, with Latinos having the highest rate, followed by Native Hawaiians, Japanese Americans, African Americans and whites. Here, we characterized differences in HCC underlying etiology, tumor characteristics and survival across these racial/ethnic groups. Methods: Incident HCC cases after cohort entry were identified via linkages to California and Hawaii SEER registries. For this analysis, we included cases linked to the fee-for-service Medicare between 1999-2014. Tumor characteristics and treatment data were obtained from SEER and underlying etiology was determined using Medicare claims data. Date and cause of death were ascertained using state death certificate files and the National Death Index. Cox models were used to calculate multivariable hazard ratio (HR) and 95% confidence intervals (CI) for overall death. Results: 359 incident cases of HCC (142 Japanese Americans, 106 Latinos, 46 whites, 42 African Americans, and 23 Native Hawaiians) were included in this analysis. The average age at HCC diagnosis was 75.1

years. The most common etiology was hepatitis C infection (HCV) (34.5%), followed by nonalcoholic fatty liver disease (NAFLD) (29.8%), and alcoholic liver disease (12.8%). There were significant ethnic differences in the underlying HCC etiology ($P < 0.0001$). African Americans (59.5%) and Latinos (40.6%) were more likely to be diagnosed with HCV-related HCC; NAFLD came second in these populations (16.7% in African Americans and 29.3% in Latinos). In Japanese Americans (31.7%) and Native Hawaiians (39.1%), NAFLD is the most common etiology followed by HCV (26.1% in Japanese Americans and 13.0% in Native Hawaiians). The proportions of HCV (34.8%) and NAFLD (32.6%) HCC were similar in whites. While the stage distribution was similar across ethnic groups ($P = 0.76$), receipt of treatment varied significantly ($P = 0.0005$). African Americans had the highest proportion of no treatment (50.0%), followed by Latinos (45.3%), Native Hawaiians (26.1%), Japanese Americans (26.1%), and whites (15.2%). HCC-related death (72.2%) was the most common cause of mortality. Median survival in whites was 14.7 months, Japanese Americans 12.4 months, Native Hawaiians 12.2 months, Latinos 8.8 months and African Americans 6.4 months. After adjusting for sex, cancer stage, underlying etiology and receipt of treatment, African Americans (HR=1.78; 95% CI: 1.04-3.06) had significantly higher mortality, while Latinos (HR=1.36; 95% CI: 0.87-2.12), Japanese Americans (HR=0.96; 95% CI: 0.63-1.46) and Native Hawaiians (HR=0.55; 95% CI: 0.29-1.05) had no significant differences in mortality compared to whites. Conclusions: We found significant ethnic differences in HCC underlying etiology, receipt of treatment and disease outcome. Acknowledging differences in underlying HCC etiology and access to treatment in different ethnic groups is important for improving HCC outcomes and reducing disparities.

B113 Unique hormone receptor signatures of inflammatory breast cancer in a cohort of Puerto Rican women.

Zoe C Underhill¹, Mayra Rivera², Michelle M Martinez¹. ¹Universidad Central del Caribe, Bayamon, PR, USA, ²Manati Medical Center, Manati, PR, USA.

Inflammatory breast cancer (IBC) is an uncommon although highly lethal form of breast cancer. Existing IBC research focuses mainly on United States or European populations, limiting current knowledge of patient profiles in Hispanic populations. Given the unique genetic admixture that exists in PR, we are interested in characterizing IBC within this population to broaden understanding of this disease. We designed a retrospective study which was deemed exempt by the UCC-IRB. A sample of breast cancer patient charts were reviewed at Manatí Medical Center and Pavia Hospital.

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Of these, 18 eligible subjects with a new primary diagnosis of IBC between 2012-2019 were identified and data was collected from oncologist and pathologist reports. On review, 78% of patients were negative for HER-2/neu receptor overexpression and there was a difference, although not statistically significant ($p=0.09$) compared to other receptor status. This result differs from other studied populations which place HER-2/neu positivity in the range of 36-60% for IBC. Interestingly, 36.4% expressed the particular signature (ER+, PR+, HER2/neu-) and 36.4% presented as triple negative for tumor markers (ER-, PR-, HER-2/neu-) on pathology review. Our data suggests that within the context of the population studied, IBC is less likely to express HER-2/neu receptor compared to IBC in other populations, and we identified two specific signatures that comprise the majority of the cases studied. To improve patient outcomes for IBC it is critical to have foundational understanding of the disease characteristics and course within a diverse group of patients. This study aims to set such a foundation within the population of PR. With this knowledge, further treatments can be tailored to meet the needs of unique or minority populations such as this one.

B114 Impact of nativity on survival among blacks with hepatocellular carcinoma in California (1988-2016). Kali Zhou, Ziwei Song, Norah A Terrault, Lihua Liu. University of Southern California, Los Angeles, CA, USA.

Introduction/Objective The most striking racial/ethnic disparity among those with hepatocellular carcinoma (HCC) in the United States (US) is worse survival among black Americans. However, existing literature does not consider birthplace among blacks. Differences in risk factors for HCC between US-born (USB) and foreign-born (FB) blacks may influence the natural history of the disease. Our objective was to examine impact of nativity on survival among blacks with HCC utilizing a population-based cohort from California. **Methods** We identified cases of HCC (ICD-O-3: C220 and 8170) diagnosed between 1988 and 2016 in the statewide California Cancer Registry (CCR). Non-Hispanic black HCC cases with available birthplace information were included in this study (9.7% unknown excluded). Cases were identified as foreign-born if reported or estimated birthplace was outside of the US or its territories. Primary outcome was overall survival after HCC diagnosis. We examined distributions of sociodemographic and tumor characteristics by nativity including disease stage at diagnosis (localized, regional, or distant) and type of therapy received (none, surgical, or non-surgical). The association between nativity and survival was examined using Kaplan-Meier survival curves

and multivariable Cox regression. Other factors associated with survival were also evaluated. Results A total of 4019 non-Hispanic black HCC cases were identified in CCR, of which 254 (12.6%) were FB. FB were more likely than USB to be female (30 vs 24%, $p=0.02$) and more likely to be diagnosed under the age of 40 (10 vs 1%) or between ages 40-50 (15 vs 7%, $p<0.001$). FB were also more likely to be of higher socioeconomic status (SES) (30 vs 21%, $p<0.001$). No obvious differences in stage distribution were noted between USB and FB with ~40% localized, ~25% regional, and ~24% distant disease. Nearly half of those in both groups received no treatment. Among those that received treatment, 19% of FB versus 24% of USB received surgical treatment ($p=0.54$). Overall 75% (191/253) of FB and 90% (3386/3761) of USB died, with median survival of 6 months (IQR 1-32) and 5 months (IQR 1-19), respectively. In multivariable analysis adjusting for age, sex, marital status, SES, tumor stage, and treatment type, FB had improved survival compared to USB (HR 0.8, $p=0.006$). For both FB and USB, localized stage of disease and receipt of any therapy type were associated with improved survival ($p<0.001$). Female sex and higher SES were associated with improved survival among USB ($p<0.01$). No association between age at diagnosis and survival was found for either group. Conclusion FB blacks in California more commonly present with HCC at younger age (<50) than USB. Overall survival was significantly better in FB than USB blacks, though remains low for both groups, and those diagnosed at younger age did not demonstrate improved survival. This study highlights the need to enhance our understanding of factors that contribute to poor outcomes among blacks with HCC.

B115 Breast cancer screening, diagnostic and/or treatment care processes in care institutions in the Chicago area. Carla Amato-Martz, Anne Marie Murphy. Metropolitan Chicago Breast Cancer Task Force, Chicago, IL, USA.

Background In a changing healthcare landscape, more work needs to be done to explicate challenges with access to quality breast health care and to identify areas in need of process and quality improvement. Continuing its mission to eliminate disparities in breast cancer care, the Metropolitan Chicago Breast Cancer Task Force is focusing its efforts on structural and quality issues, with the goal of identifying gaps in care and processes in order to help low-resource facilities to implement practices aimed at delivering quality care for all. Toward this end, the Task Force is continuing its study of breast cancer care processes in institutions in the Chicago area. The aim of this study is describe the current breast healthcare landscape in Chicago and to explore the

related care processes and resources for patients undergoing breast cancer screening, diagnosis, and/or treatment, including precision medicine. This study identifies breast care practices and variations in care processes amenable to quality improvement (QI) interventions. This iteration of our care process study includes an additional focus on changes following the implementation of the Patient Protection and Affordable Care Act (ACA), Illinois Medicaid reform and expansion of Medicaid eligibility. There are three aims to this study: Objective 1: Explore each institution's current breast care processes across the disease trajectory, including screening, diagnosis, treatment and supportive care, with an emphasis on patients covered under Medicaid. Objective 2: Benchmark and analyze breast care processes across de-identified institutions with the end goal of producing and disseminating a summary report. Objective 3: Evaluate the feasibility of quality improvement initiatives to address care process improvements in low-resource sites, with an assessment of outcomes pre- and post- intervention. Methods The study will utilize three surveys that will be distributed to all participating facilities via the Qualtrics survey platform. The surveys are as follows: • Medicaid Managed Care Survey This survey contains questions related to how Illinois' Medicaid managed care system has impacted the facility. • Environmental Scan Screening/Diagnosis Survey This survey contains questions related to the facility's processes around mammography screening, timeframes, communication with patients and providers, diagnostic processes, radiology practices, biopsy and pathology practices and patient satisfaction. • Environmental Scan Treatment Survey The treatment survey contains specialty-specific questions (e.g., pathology, radiologist, surgeon, etc.) which will require responses from different individuals knowledgeable in these areas. Participating facilities will receive an individualized report comparing facility data with aggregated data. In addition, an aggregated report will be developed. Results Preliminary study results should be available in late summer/early fall. Available results will be reported in the poster.

B116 Evaluating the ability of clinically approved chemotherapeutics to decrease race-associated breast cancer mortality disparities via targeting the tumor-promoting effect of Crystallin Beta B2. [Portia L. Andrews](#), Denise K. Reaves, Megan E. Martin, Michael Tarpley, Kevin P. Williams, Jodie M. Fleming. North Carolina Central University, Durham, NC, USA.

In the United States, breast cancer (BC) remains the second leading cause of cancer death in women. The unequal

burden in the mortality of BC in African American (AA) women compared to Caucasian American (CA) women goes without full explanation. When socioeconomic factors such as education and income are accounted for, this mortality disparity persists. Therefore, to acquire an understanding of how to end BC disparities, it is crucial to examine the underlying cellular and molecular mechanisms driving this disproportionate outcome. Studies on gene expression analyses have identified a particular gene, CRY β B2, with higher expression in AA breast tumors. Expression of CRY β B2 was also found to be increased in studies comparing AA and CA colorectal, renal, glioblastoma, and prostate cancers, and has been linked with decreased survival. Although the precise mechanisms of elevated CRY β B2 expression remain unknown, overexpression is significantly associated with BC tumor promotion. In view of this, we investigated the biological effects of CRY β B2 in basal-like, triple negative breast cancer (TNBC) cell lines. CRY β B2 expression was manipulated via CRISPR/Cas9-mediated knockout and lentiviral overexpression systems. Our preliminary data show enhanced proliferation and invasion in 3D cultures with cells overexpressing CRY β B2 compared to controls, suggesting two mechanisms by which CRY β B2-overexpression may enhance tumor promotion and promote poor patient outcome. To identify drugs that may specifically target cells overexpressing CRY β B2, we subjected one of our CRY β B2 model systems (SUM159 cells overexpressing CRY β B2, with CRY β B2 knocked out, and the parental SUM159 cells with low CRY β B2 expression) to increasing doses of 125 clinically approved chemotherapeutics. High content live cell imaging was used to evaluate the effects of the drugs by measuring 3D spheroid BC cell growth, and IC50 were generated to determine whether cells with altered CRY β B2 expression were more or less sensitive to particular classes of drugs. Drugs identified with increased cytotoxicity to cells overexpressing CRY β B2 were confirmed using two additional TNBC models with altered CRY β B2 levels. Additional in vitro mechanistic studies evaluating the effect of the drugs on proliferation, cytotoxicity and invasion of CRY β B2-overexpressing were executed in 3D cultures with live cell imaging. Drugs that significantly affect the proliferation or invasion of CRY β B2-overexpressing cells will be evaluated in future studies for efficacy and toxicity in conjunction with other chemotherapeutics via in vivo AA-specific xenografts and PDX models. This information will be used to explore the potential use of these chemotherapeutics for neoadjuvant or adjuvant therapy in BC patients with tumors that overexpress CRY β B2. The identification of clinically approved drugs that inhibit CRY β B2 function may quickly be applied in the clinic to increase survival rates until more effective and less toxic, targeted-therapies are developed.

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B117 Body positivity after a double mastectomy. Chiara D'Agostino. Independent Advocate, Montclair, NJ, USA.

A healthy body image after a traumatic double mastectomy is an important phase of survivorship. Part of the healing process in breast cancer is to learn to love one's body again, with all its changes. Body Positivity After a Double Mastectomy explores a woman's journey to body positivity despite her physical and emotional challenges.

B118 Characteristics of patients with pseudoangiomatous stromal hyperplasia (PASH): A retrospective cohort study. George Bukenya¹, Demetra Hufnagle², Nneka Anyawu³, Stephanie Kurita², Alicia Beeghly-Fadiel². ¹Belmont University, Nashville, TN, USA, ²VUMC, Nashville, TN, USA, ³Meharry Medical School, Nashville, TN, USA.

Background: Pseudoangiomatous stromal hyperplasia (PASH) is a proliferative mesenchymal lesion of the breast histologically defined by dense collagenous stroma with spindle-shaped myofibroblasts. Characterization of patients with PASH has largely been limited to histologic and radiographic studies with small sample sizes due to the rarity of this benign condition. Furthermore, no existing studies of PASH have yet to consider race. Objectives: We undertook this study to identify subjects with PASH from electronic medical records (EMR) at the Vanderbilt University Medical Center (VUMC) and evaluate patient characteristics, including differences by race. Approach: We used natural language processing (NLP)-assisted searches to identify 283 subjects with pathology reports containing 'PASH' or 'pseudoangiomatous stromal hyperplasia'. Results: We confirmed PASH by pathology report for 229 subjects (80.9%). The majority were Caucasian women, although 24 African Americans (10.5%) and 4 males (1.7%) with PASH were also identified. A total of 27 (11.8%) had a diagnosis of cancer as some point in their EMR, most frequently breast (74.1%) or thyroid (14.8%) cancer. The median age at PASH diagnosis was 45.4 years (range: 12.9-84.6) but this seemed lower among Asians (31.4 years). PASH was found more frequently in the left breast (54.8%) and was ascertained most often by core needle biopsy (76.0%), stereotactic needle biopsy (11.8%), or excision (7.0%). Among initially biopsied patients, 20 (9.9%) and 39 (19.3%) had subsequent biopsies and excisions, respectively. No significant differences in any of these characteristics by race were identified. Conclusions: This data confirms that PASH is not exclusive to Caucasians and suggests that patient characteristics do not differ by race. Analysis of additional characteristics and patient outcomes, with inclusion of EMR time, is currently underway.

B119 Annexin a2: A novel molecular mechanism of aggressive metastasis and angiogenesis. Pankaj Chaudhary, Jamboor K. Vishwanatha. University of North Texas Health Science Center, Fort Worth, Texas, USA.

Background: Triple negative breast cancer (TNBC) is an aggressive breast cancer subtype that affects African-American (AA) women three times more frequently than Caucasian (CA) women. TNBC metastasis is mediated by intercellular communication between tumor cells and the stromal microenvironment. These interactions occur via secreted factors and small vesicles called exosomes. Tumor-derived exosomes mediate both tumorigenesis and tissue-specific metastasis, by stimulating angiogenesis, attracting immune and stromal cells, and by remodeling the extracellular matrix. Thus, a better understanding of the relative contributions of TNBC-derived exosomes has great potential to improve the prevention and treatment of TNBC. In the present studies, we focus on the characterization of TNBC-derived exosomal protein, called Annexin A2 (AnxA2), which is up-regulated in TNBC tumors and implicated in promoting tumorigenesis and angiogenesis. Methods: Exosomes were isolated cells and characterized via Western blotting and particle size analyzer. In vitro endothelial tube formation assay, and in vivo matrigel plug assays were used to explore the role of exo-AnxA2 in angiogenesis. Experimentally induced (intracardiac/tail vein injection) metastasis models were used to examine the function of exo-AnxA2 in metastasis. The function of AnxA2 in exosomes was blocked by either depleting the AnxA2 expression using shRNA in cells or using AnxA2 competitive inhibitory peptide in exosomes. Results: Our results revealed that exo-AnxA2 expression is significantly higher in malignant cells than normal and pre-metastatic breast cancer cells. Our in vitro (endothelial tube formation assay) and in vivo (matrigel plug assay) angiogenesis studies demonstrated that exo-AnxA2 promotes tPA-dependent angiogenesis in breast cancer. Furthermore, in vivo analysis in nude mice indicated that TNBC cells-derived exosomes create a favorable pre-metastatic microenvironment for aggressive metastasis, and exo-AnxA2 plays an important role in this process, as priming with AnxA2-depleted exosomes reduce brain (~4-fold) and lung (~2-fold) metastasis. Upon delineating the mechanism, we found that exo-AnxA2 causes macrophage-mediated activation of the p38MAPK, NF- κ B, and STAT3 pathways and increased secretion of IL6 and TNF α . We observed that the concentration of circulating exo-AnxA2 in TNBC patient's sera were significantly elevated compared to ER+, HER2+ and normal individuals. In addition, our results suggest that the high expression of exo-AnxA2 in AA TNBC patient's serum correlates with health disparity. Collectively, our data

demonstrate an important role of circulating exo-AnxA2 in TNBC pathogenesis. Conclusion: We found increased expression of exo-AnxA2 in TNBC patient-derived cell lines and sera. Further, we found that exo-AnxA2 is a potent inducer of angiogenesis and metastasis indicating a possible role of exo-AnxA2 in pre-metastatic niche formation and cancer progression.

B120 Hospitalization may be an early indicator of worse breast cancer survival among women from disparate populations.

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Background: Missouri is burdened by high breast cancer (BC) mortality rates, particularly among women from disparate populations (individuals living in poverty, rural areas, and African Americans). In a prior study, we found that women diagnosed with BC from disparate populations have a high prevalence of comorbidities and these commonly diagnosed comorbidities were associated with worse BC prognosis. We now hypothesize that the frequency of hospitalizations may be an early indicator of increased mortality and may be used to identify at risk BC patients with co-morbid conditions. Methods: Women age 18+ diagnosed with invasive BC in Missouri during 2004–2012 were identified from the Missouri Cancer Registry. Data were merged with hospital discharge data from the state Patient Abstract System. A comorbidity score was constructed to reflect the number of inpatient admissions for the 3 most prevalent conditions (Type-2 diabetes, hypertension, and CVD) among patients. We identified women who experienced an inpatient hospitalization > 1 year after their BC diagnosis to ensure hospitalizations were not due to reasons associated with their primary BC diagnosis. For risk of BC mortality, adjusted hazard ratios (HR) and 95% confidence intervals (CI) were calculated using Cox proportional hazards regression models overall and stratified by race, poverty level, rural/urban residence, and age. Results: A total of 36,581 women with incident invasive BC and comorbidity data at the time of BC diagnosis were analyzed. After a median follow-up time of 78 months, 11,102 deaths occurred, of which 6,232 were BC deaths. Approximately 31% of patients had ≥1 comorbidity and 17% had been hospitalized once. Increasing number of

comorbidities was significantly associated with the likelihood of being hospitalized after BC diagnosis (p -trend < 0.001). BC patients with ≥ 5 hospitalizations post diagnosis compared to no hospitalization after adjusting for comorbidities and prognostic factors had increased BC mortality risk (HR, 2.62; 95% CI 2.31-2.97). Having just one hospitalization significantly increased the risk of BC death by 34% compared to women without a hospitalization. In stratified analyses, we observed significant differences in associations between hospitalizations and BC mortality by race ($p=0.02$), residential location ($p < 0.01$), and age ($p < 0.001$). Women < 50 years of age and with ≥ 5 hospitalizations had over 600% increase in risk of BC death (HR, 6.51; 95% CI 5.12-8.29) compared to women < 50 years without hospitalizations. Among women with ≥ 1 comorbidity, ≥ 5 hospitalizations increased risk of BC death by 83% (HR, 1.83; 95% CI 1.54-2.17) compared to women without a hospitalization. Conclusion: BC patients who have comorbidities and experience a hospitalization post diagnosis are at increased risk of BC mortality. Further, hospitalizations could be used to identify high risk survivors that could benefit from targeted interventions. Analyses evaluating diseases contributing to hospitalizations are ongoing.

B121 Pathologic characteristics of African American women with breast cancer treated at the DoD's Murtha Cancer Center: Why survival cancer is not disparate to European American women when treated within the US military healthcare system.

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(AAW) are significantly higher than in European American women (EAW), including a 42% higher mortality detected in AAW in the SEER database and a worse breast cancer-free interval for AAW in The Cancer Genome Atlas. In contrast, survival analysis from women treated within the Department of Defense Military Healthcare System (DoD MHS) healthcare system found that AAW and EAW with early-stage breast cancer had similar survival rates. In this study, we evaluated pathological factors of AAW treated within the Murtha Cancer Center at Walter Reed National Military Medical Center to identify factors associated with this lack of disparate outcomes within the DoD MHS. Methods: Between 2001-2018, 346 AAW and 746 EAW treated at MCC/WRNMMC enrolled in the Clinical Breast Care Project(CBCP).

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All diagnoses were performed by a single breast pathologist and pathological characteristics including stage (AJCC Cancer Staging Manual seventh edition), grade, size, lymph node, hormone receptor and HER2 status were recorded. Data were analyzed using chi-square and log-rank analyses and Student t-tests with a P-value <0.05 used to define significance. Results: African American women comprised 29% of the women with invasive breast cancer in the CBCP. The average age at diagnosis was 56.1 years in AAW and 58 years in EAW and the frequency of women diagnosed <40 years of age did not differ significantly (9% AAW, 7% EAW). Tumor stage (P=0.004), grade (P<0.001), size (P<0.001), subtype (P<0.001) and lymph node status (P=0.028) all differed significantly between populations. Breast tumors from AAW were significantly less likely to be diagnosed at stage I compared to EAW (43% AAW, 55% EAW), and more likely to be lymph node positive (40% AAW, 33% EAW) and size T2 (34% AAW, 26% EAW). Biologically, AAW were more likely to have poorly differentiated (43% AAW, 28% EAW) and triple negative (24% AAW, 14% EAW) tumors. Seven percent of AAW and 6% of EAW died of disease with no significant difference in time to death (4.22 years AAW, 4.67 EAW). Neither 5-year nor 10-year survival differed significantly between populations. Conclusion: These data across all stages of breast cancer diagnosis support an earlier finding in early-stage patients that survival disparities, common in the general population, are not detected for AAW treated within the DoD MHS. Critically, this survival advantage for AAW treated at MCC/WRNMMC exists against a background of AAW having tumors with less favorable pathological characteristics, as seen in the US general population. Evaluation of pre- and post-diagnostic care within DoD MHS should be performed to determine how breast care within an equal-access healthcare setting is received by AAW patients and the DoD MHS can be used as a model of care to reduce breast cancer disparities within the US general population.

B122 Spatial analysis of ductal carcinoma in situ, locoregional, and distant metastatic breast cancer in North Carolina: Evidence for rural-urban disparities. Larisa M. Gearhart-Serna¹, Kate Hoffman², Gayathri R Devi¹. ¹Duke University School of Medicine, Durham, NC, USA, ²Duke University, Durham, NC, USA.

Introduction: A projected 8870 women will be diagnosed with breast cancer in North Carolina (NC) in 2019, with 1390 estimated deaths. However, breast cancer is a heterogeneous disease, and investigating total incidence may hide differences in how sociodemographic factors impact the development of different subtypes of breast cancer, in

particular early vs late stage aggressive phenotypes. The objective of this study was to investigate geographical variation of breast cancer in NC by stage, and to determine stage-specific associations with race and urbanicity. Methods: Breast cancer patient data were obtained from the NC Central Cancer Registry (NC CCR 2009-14) and stratified by stage and comprised of patients diagnosed with ductal carcinoma in situ (7975; DCIS), locoregional (38,200; combined localized, regional, and regional with direct extensions), or distant metastatic breast cancer (2073) based on derived summary staging defined by the Surveillance, Epidemiology, and End Results (SEER) program. Spatial distribution maps were generated in ArcMap 10.5.1 software for age-standardized incidence ratios (SIRs) by county using the NCCCR patient dataset described and age distributions from 2014 U.S. Census population estimates. Additionally, we stratified patients by rural-urban continuum code (RUCC), condensed for our purposes into three rural-urban categories: metropolitan urbanized, non-metro urbanized, and less populated. Results: DCIS, locoregional, and distant metastatic breast cancers all exhibited patterns of significantly different SIRs than expected based on state incidence rates in the northeastern region of NC, while DCIS and total breast cancer also had significantly different SIRs in the western region. Approximately 70% of patients inhabited metropolitan urbanized areas regardless of breast cancer stage, however, the highest incidence rates for all stages were consistently observed in less populated counties. Mean age at diagnosis for all stages was slightly higher in less populated areas, for example 61.4yrs DCIS and 62.8yrs distant metastatic breast cancer, than metropolitan areas, at 60.0yrs DCIS and 60.1yrs distant metastatic breast cancer. A higher percentage of distant metastatic breast cancer patients (29%) versus locoregional or DCIS patients (both 20%) in the dataset self-identified as Black, a pattern consistent across rural-urban categories. The percentage of current smokers was also higher for distant metastatic breast cancer cases (10%) than locoregional (6%) or DCIS cases (5%) across all rural-urban categories. Conclusions: Our results indicate that breast cancer incidence in NC varies geospatially by stage with incidence often higher in less populated areas. There were also age, race, and smoking status disparities across rural-urban stratifications and in patients with late stage breast cancer, which have the potential to contribute to poor survival outcomes in high risk patients.

B123 Using eHealth and data science to dissect breast cancer heterogeneity in the Chicago Multi-Ethnic (ChiMEC) Breast Cancer Cohort. Dezheng Huo¹, Nike Beaubier², Nora Jaskowiak¹, Rita Nanda¹, Gini Fleming¹, Masaya Hattori¹,

Padma Sheila Rajagopal¹, Abiola Ibraheem¹, Brenda Copley¹, Qun Niu¹, Fang Liu¹, Elisabeth Sveen¹, Toshio Yoshimatsu¹, Galina Khramtsova¹, Yonglan Zheng¹, Taylor Abboushi², Kevin White², Olufunmilayo Olopade¹. ¹University of Chicago, Chicago, IL, USA, ²Tempus Labs, Chicago, IL, USA.

Background: Differences in tumor biology, genomics and health care delivery patterns contribute to breast cancer mortality gap between white women of European ancestry (EA) and black women of African ancestry (AA) in the US. Accumulating evidence suggest that the genetic architecture of breast cancer is different across race and ethnicity but individuals of African ancestry, with the oldest and most diverse genome, remain under represented in clinical trials. Beyond interventions to improve quality of guideline directed cancer care, there is an urgent need to implement and disseminate innovative interventions that promote health equity and inform evidence based interventions. **Method:** We established a breast cancer patient cohort by collecting clinical and epidemiological data via electronic medical records and interview as well as biospecimen banking at the University of Chicago Comprehensive Cancer Center. We compared overall survival and relapse-free survival between EA and AA patients using Cox models. We also examined racial difference in pathologic complete response (pCR) in patients receiving neoadjuvant therapy. Using the xT 595-gene panel (Tempus Labs, Inc.) with matched tumor-normal samples in a subset of the cohort (n=127), we evaluated genomic heterogeneity. **Results:** 2773 stage I-III breast cancer patients were enrolled in the cohort, including 54% white, 39% black and 7% Asian and Hispanic patients. Over a median follow-up of 5.8 years, 456 patients died and 301 patients had recurrent breast cancers. After adjusting for stage, age, and comorbidities, AA patients had higher mortality rate than EA patients, and the racial difference varied across molecular subtypes: the hazard ratios comparing AA vs. EA patients were 3.92 (95% CI 1.58-9.73) in the hormone receptor (HR)-/HER2+ group, 1.55 (1.20-2.01) in the HR+/HER2- group, 1.51 (0.81-2.80) in the HR+/HER2+ group, and 1.21 (0.82-1.80) in the triple negative group. Of the 560 patients undergoing neoadjuvant chemotherapy, 166 (30%) had pCR. AA patients had lower pCR rate than EA patients (26% vs. 34%, p=0.053). Of note, molecular subtype was a strong predictor for pCR (p<0.001), highest in HR-/HER2+ group (59%), followed by triple negative (32%), HR+/HER2- (26%), and HR+/HER2- (16%) groups. In patients with pCR, 4 died, compared to 78 deaths in patients with residual diseases after neoadjuvant therapy (hazard ratio 9.70, 95% CI 3.51-26.8; p<0.001). Genomic mutations for therapy resistance and relapse will be integrated before the meeting presentation. **Conclusion:** Racial differences in pCR in part

explain the mortality disparity between AAs and EAs in the ChiMEC cohort. This underscores the need for broader access to adaptive biomarker based clinical trials in communities that serve predominantly AA breast cancer patients.

B124 Breast cancer treatment delays at an urban safety net hospital among women experiencing homelessness.

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Abstract Disparities in outcomes for vulnerable women is a persistent, ongoing problem. Timely treatment improves breast cancer outcomes and efforts to improve delays among underserved patients is needed. Specifically, homelessness and breast cancer treatment outcomes are understudied. This is a novel and descriptive study exploring types of homelessness and treatment delays at an urban safety net hospital providing care to a vulnerable patient population. **Experimental Procedures** This study is a retrospective chart review of homeless female patients diagnosed with breast cancer between January 1, 2000 and December 31, 2014. Data for this study were acquired from the hospital cancer registry and electronic medical record. Homelessness was categorized as transitionally, episodically or chronically homeless. Other variables collected included demographic characteristics and time to treatment. A detailed chart review was conducted to identify delays to breast cancer treatment and the potential reasons for delay between diagnosis and first treatment. All demographic characteristics, time to treatment and factors related to delays to treatment were analyzed descriptively, reporting frequencies and proportions. Delay to treatment was calculated as date of pathologically confirmed biopsy of breast cancer to date of first treatment (surgery or chemotherapy). **Summary of Data** The total number of individuals analyzed was 24. All except two subjects were delayed to treatment (> 30 days from diagnosis to treatment). Most women in this cohort were categorized as chronically homeless (46%) with the rest categorized as transitionally (29%) or episodically (12%) homeless. The majority of subjects (70%) were Black, non-Hispanic. Most women identified as single (58%) or divorced (21%) at the time of breast cancer diagnosis. All except one subject were publicly insured (71% Medicaid; 12% Medicare) or uninsured (8%). Regardless of type of homelessness, most

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subjects were either 30-60 or 60-90 days delayed. Those who were chronically homeless experienced significantly more delays to first treatment (56% of those who were delayed 30-60 days and 57% of those who were delayed 60-90 days; p-value 0.006) than those who were episodically or transitionally homeless. Conclusions Significant delays and barriers to breast cancer treatment exist among women experiencing homelessness. Further studies and focused efforts to improve timely breast cancer care for homeless women is warranted.

B125 Molecular profiling basal 2 subtypes of triple-negative breast cancer cells and their response to histone deacetylase inhibitor. Beverly Lyn-Cook¹, Destiny Stovall², Beverly Word¹, Ebony Cotton¹, George Hammons¹. ¹FDA/NCTR, Jefferson, AR, USA, ²University of Arkansas at Pine Bluff, Pine Bluff, AR, USA.

Triple negative breast cancer (TNBC) is an aggressive form of breast cancer that often strikes young women, particularly minority women in their reproductive years. This cancer has a poor prognosis, mainly due to the lack of effective chemotherapeutic agents. Triple negative breast cancers present an additional problem, in that a histologically subtype can have molecularly different forms. Studies have shown that histological designated tumors yield different treatment results. Recently, molecular profiling of a patient's tumor yielded detection of specific driver genes that resulted in the use of single or combination therapies targeting these driver genes. Basal 2 subtype is one of the most aggressive form of TNBC. This study examined the molecular profiles of two Basal 2 triple negative breast cancers representing two different African American women in response to treatment with vorinostat. Using a RT2 Profiler PCR gene expression array, vorinostat up-regulated 54 genes and downregulated 3 genes in HCC70 TNBC. In HCC1806 TNBC, 23 genes were upregulated and 38 downregulated. The most significant change in gene expression noted in HCC70 was in CCND2, which is hypermethylated in TNBC. Changes were also noted in SNA12, SERPINE, and TWIST. In HCC1806, significant changes in gene expression were noted in ABCB1, CCND2, CDKN1C and MMP9. These results clearly demonstrated that there is a differential response to a potential anti-tumor drug by different molecular subtypes. Up-regulation of CCND2 was observed in both basal 2 cell lines. CCND2 encodes cyclin D2 in which low expression is associated with poor prognosis. Understanding individual differences in cancer driver genes will greatly improve personalized medicine in TNBC.

B126 The Will Rogers phenomenon in breast cancer: The AJCC 8th Ed. and the importance of caution in the interpretation of outcomes differences for overall population and race-specific cohorts. Mary R Nittala, Eswar K Mundra, SatyaSeelan Packianathan, Divyang Mehta, William C Woods, Shawn Mckinney, Barbara S Craft, Srinivasan Vijayakumar. University of Mississippi Medical Center, Jackson, MS, USA.

Purpose: To assess whether the Will Roger's phenomenon [WRP] exists with the move from the AJCC 7th to AJCC 8th edition in Breast Cancer staging and if racial differences are manifested in the expression of the WRP. Methods: A retrospective analysis of 300 women diagnosed with breast cancer between 2007 and 2017 at an academic medical center was performed. Pearson's square test was used to compare the proportional differences between the anatomic staging system represented by the 7th edition and the prognostic staging of the 8th edition among Caucasian [C] and African-American [AA] women. Kaplan- Meier analysis was used to estimate overall survival [OS] and disease-free survival [DFS] between the races and compared using the log-rank test. Bi and multi-variate Cox hazard regression analyses were used to identify any racial factors associated with outcomes. The SPSS v.24.0 was used for all statistical analyses. Results: Our patient cohort included 30.3% C and 69.7% AA (median age, 62 y; range 34- 92 y). Stages I, II, III, and IV accounted for 46.2%, 26.3%, 23.1%, and 4.4% of C and 28.7%, 43.1%, 24.4%, and 3.8% of AA respectively, in anatomic staging (p= 0.043). In prognostic staging, 52.8%, 18.7%, 23%, and 5.5% were C while 35%, 17.2%, 43.5%, and 4.3 % were AA, respectively (p=0.011). A total number of 41 C (45.05 %) were upstaged compared to 100 AA (47.85 %) patients. Fifteen C patients (16.49 %) and 30 AA patients (14.35 %) were down-staged. Of the remainder, 35 C (38.46 %) and 79 AA (37.79 %) patients had their stages unchanged (P=0.859). The median follow-up duration for this cohort was 58 months (range 4- 235 months). The AA patients showed better stage -by- stage 5- year OS rates using 8th edition compared to the 7th edition, suggesting a manifestation of the WRP. Among the C patients, those who were stage IIIA in the 7th edition but became stage IB in the 8th had a better prognosis than stages IIA and IIB in the 8th edition (p=0.000). For AA patients, stage IIIA, IIIB, IIIC, and IV all demonstrated better prognoses in the 8th edition when compared to the 7th edition (p=0.000). In terms of DFS, the 8th edition's clinical staging showed complex results (p=0.176) compared to DFS estimated using the 7th's anatomic staging system (p=0.004). For C patients, stages IA, IB, IIB, and IIIC all recorded better DFS when using the 8th edition while for AA patients, only those with stages IB and IIIC showed better DFS in the 8th edition compared to

the 7th. Conclusion: Our analyses suggest that the WRP exists in the move from the AJCC 7th to the 8th edition in breast cancer staging in both C and AA patients. However, there was significant variability between the races in the extent of its manifestation. We suggest that caution needs to be exercised when results are compared across staging systems to account for the WRP in the interpretation of the data.

B127 Hispanic-White residential segregation and stage at diagnosis among female residents of Texas. [Chinedum Ojinnaka](#). Arizona State University, Phoenix, AZ, USA.

Background: Breast cancer is the second leading cause of cancer-related deaths among females in the United States. Individual and neighborhood-level characteristics have been associated with breast cancer-related disparities. There is a paucity of literature about Hispanic-White residential segregation and stage at diagnosis of breast cancer, and whether residential segregation explains or moderates disparities in stage at diagnosis among Hispanics. Objectives: To explore whether Hispanic-White residential segregation is associated with late-stage breast cancer, and how it explains or moderates disparities in stage at diagnosis of breast cancer associated with Hispanic ethnicity. To explore whether health insurance coverage and census tract (CT) poverty level explains or moderates disparities associated with residential segregation. Methods: This is a retrospective data analysis using the Texas Cancer Registry. The analyses were restricted to non-Hispanic White and Hispanic females ages 18 and older diagnosed with breast cancer from 2007-2014, and who had only one primary tumor. The dependent variable was stage at diagnosis (early, late). The independent variables of interest were Hispanic-White residential segregation, race/ethnicity, type of insurance coverage and CT poverty level. Multilevel logistic regression models with individuals nested within CT were used for analyses. The final sample size was 80,149 individuals nested within 5,023 CT. Results: Hispanics were more likely to be diagnosed with late-stage breast cancer (OR=1.14; 95% CI=1.10-1.19). Increasing Hispanic-White residential segregation was associated with increased likelihood of late-stage diagnosis (OR=1.46; 95% CI=1.04-2.05). Type of health insurance explained some of the association between residential segregation and late-stage diagnosis. Residential segregation did not explain or moderate the association between Hispanic ethnicity and breast cancer stage at diagnosis. Predicted probability estimates showed that individuals who were uninsured or insured through Medicaid had similar probabilities of late-stage diagnosis. These disparities were worse for uninsured or Medicaid-insured Hispanic residents of highly segregated

CTs. Conclusion: Hispanic-White residential segregation was associated with increased likelihood of late-stage breast cancer diagnosis. Interventions to increase early-stage breast cancer diagnosis are needed among residents of CTs with high residential segregation, especially among Medicaid insured and uninsured women. Interventions aimed at raising awareness of the association between Hispanic residential segregation and breast cancer stage at diagnosis among healthcare providers should be explored.

B128 The impact of race/ethnicity and insurance status on age-related differences in breast cancer survival. [Yazmin San Miguel](#)¹, Scarlett L Gomez², James D Murphy¹, Richard B Schwab¹, Corinne McDaniels-Davidson³, Alison J Canchola⁴, Alfredo A Molinolo¹, Jesse N Nodora⁵, Maria E Martinez⁵. ¹Moore's Cancer Center, University of California San Diego, San Diego, CA, USA, ²Helen Diller Family Comprehensive Cancer Center; Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA, USA, ³San Diego State University Institute for Public Health, San Diego, CA, USA, ⁴Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA, USA, ⁵Moore's Cancer Center; Department of Family Medicine and Public Health, University of California San Diego, San Diego, CA, USA.

Background: A wealth of published data exists on factors that impact breast cancer survival, including race/ethnicity, health insurance, and other sociodemographic factors; however, there is limited research on whether associations differ by age at diagnosis. The purpose of this study was to assess risk of dying from breast cancer in older (≥ 60 years) versus younger women (< 60 years) according to race/ethnicity and insurance status. Methods: From the California Cancer Registry, we identified women with a first, primary invasive breast cancer, who were ages 18 and older, diagnosed between 2005 and 2015. Multivariable Cox proportional hazards regression was used to generate hazard rate ratios (HR) and 95% confidence intervals (CI) for risk of breast cancer-specific mortality for older vs younger patients, overall and by race/ethnicity and insurance status. HRs were also calculated for race/ethnicity and insurance status, stratified by age group. Results: Of the total population (n=192,932), 94,076 (48.7%) were diagnosed under the age 60 and 98,856 (51.2%) were aged 60 and older at diagnosis. Risk of dying from breast cancer was higher in older than younger patients (HR=1.35; 95% CI, 1.29-1.40) after multivariable adjustment, which varied in magnitude by race/ethnicity (P<0.0001). Larger mortality differences comparing older vs. younger patients were observed for

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Non-Hispanic White (NHW) (HR=1.43; 95% CI, 1.36-1.51) and Hispanic women (HR=1.37; 95% CI, 1.26-1.50), and smaller but significant differences were seen in Black (HR=1.17; 95% CI, 1.04-1.31) and Asian/Pacific Islander women (HR=1.15; 95% CI, 1.02-1.31). HRs comparing older to younger patients varied by insurance status ($P < 0.0001$) with largest mortality differences observed for privately insured women (HR=1.51; 95% CI, 1.43-1.59), followed by Medicaid/military/other public insurance (HR=1.18; 95% CI, 1.10-1.26). Black vs. NHW women had a higher risk of dying regardless of age group, with higher HRs in younger (HR=1.36; 95% CI, 1.25-1.48) than in older (HR=1.11; 95% CI, 1.01-1.22) patients. In younger women, a higher risk of breast cancer mortality was observed in those with any Medicaid/military/other public insurance (HR=1.49; 95% CI, 1.41-1.58) and in those with no insurance (HR=1.96; 95% CI, 1.65-2.32), compared to patients with private health insurance. Among older women, higher risk of mortality was seen for those with any Medicaid/military/other public insurance (HR=1.13; 95% CI, 1.06-1.21) and those with no insurance (HR=1.57; 95% CI, 1.22-2.03), compared to privately-insured patients. Conclusion: Our results provide evidence for the continued disparity in survival in Black vs White women with breast cancer, which is magnified in younger women. Moreover, lack of health insurance continues to play a role in breast cancer survival, with uninsured women having the highest risk for breast cancer death, regardless of age.

B129 Does insurance status explain the racial disparity in survival outcome seen in upper aerodigestive tract cancers in the United States? *Joycemary G Amponsem,*

Dana Marshall, Derek Wilus, Mohammad Tabatabai. Meharry Medical College, Nashville, TN, USA.

Upper Aerodigestive tract (UADT) cancers are primarily squamous cell carcinomas that affect the oral cavity (hard palate, front 2/3 of tongue, gums, mucosal lining of lips and cheeks, and the floor of the mouth), oropharynx (base of the tongue, soft palate, and tonsils), hypopharynx, larynx (epiglottis and vocal cords), and the upper third of the esophagus with a five-year survival rate of 65.3% for oral cavity and pharyngeal cancers. If the cancer is detected during the localized stage, the survival rate improves to 84.4% (SEER 18 2009-2015). There have been several risk factors implicated in the pathogenesis of UADT cancers such as, male gender, smoking, alcohol use, and infection with human papilloma virus (HPV) for oropharyngeal cancers. The current literature suggests that regardless of stage people of African descent have a lower incidence of UADT cancers, but higher mortality rates compared to Caucasians. There are many proposed explanations for this paradoxical trend

seen in African Americans. However, there is a paucity of research addressing this problem. We seek to understand if socioeconomic status is the underlying factor driving this disparity. We analyzed de-identified data collected from the Surveillance, Epidemiology, and End Results (SEER) program for 114,510 UADT cancer patients diagnosed from 2007-2016. We hypothesized that people who were uninsured or on Medicaid would have a life expectancy that was significantly reduced compared to those that had private insurance or Medicare regardless of race, tumor grade, gender or site of the cancer. Our study design is retrospective cohort. Our multivariate analysis model utilizes survival analysis techniques such as Kaplan-Meier survival, hazard curves and proportional hazards regression to analyze the survival time of our patients as a function of demographic and clinical variables. Survival months ranged from 0 to 119 months, with 25,122 patients experiencing death due to UADT cancers. The proportional hazards regression revealed that across all insurance groups (Insured, Uninsured, Medicaid, and Unknown) the survival time for Non-Hispanic Black People was significantly reduced compared to the other race/ethnicities (Asians, Caucasians, Hispanics (all races)) with Non-Hispanic Caucasians having the highest survival rate. Determining that the racial disparity exists regardless of insurance status, tumor grade, gender, and site of cancer can guide future researchers to focus on biological differences or other factors such as lack of access to care that underlie disease survival for UADT cancers.

B130 Characteristics of young-onset colorectal cancer patients and variation of treatment patterns: An analysis of US hospital data. *Georges Adunlin¹,*

Hadiza Galadima², Matthew Asare³. ¹Samford University, Birmingham, AL, USA, ²Old Dominion University, Norfolk, VA, USA, ³Baylor University, Waco, TX, USA.

Background: While colorectal cancer (CRC) mortality and incidence are declining in the United States among older adults, this decrease may not be observed among patients under the age of 50. This study examined the characteristics of young-onset CRC among hospital patients by comparing baseline characteristics as well as treatment patterns for patients < 50 years of age to those \geq 50 years of age. Methods: Data from Sentara hospitals systems were utilized. The sample included patients diagnosed with colorectal cancer in Virginia from January 1, 2008 to December 31, 2016. Baseline characteristics were compared using chi-squares and t-tests. Stratified analyses using the Cochran-Mantel-Haenszel test was used to examine the associations between receipt of cancer therapy by age group while controlling for

any differences in stage of diagnosis. The Breslow-Day Test was used to test the homogeneity of the odds ratios. Level of significance was set at $p < 0.05$. Results: There were 4,505 CRC cases diagnosed at eight Sentara Hospitals in Virginia from 2008 to 2016. Among them, 11.59% ($n = 522$) were aged 18-49 years old at diagnosis with a mean age of 42.74 ($SD = 5.87$) years. The results of the bivariate analysis showed a statistically significant difference between patients < 50 years of age and those ≥ 50 of age by race, primary payer, alcohol and tobacco history, Charlson comorbidity index, stage of diagnosis, tumor site, tumor size, and treatment therapy for radiation and chemotherapy. More specifically, compared to their counterpart ≥ 50 years of age, people younger than 50 diagnosed with CRC were more likely to be African American (28.74% vs. 23.71%, $p = 0.0086$), to own a private insurance (68.49% vs. 27.60%, $p < 0.0001$), or to be uninsured (12.91% vs. 3.82%, $p < 0.0001$), and interestingly to have never used tobacco products (50.43% vs. 43.75%, $p < 0.0001$). Most importantly, the young age CRC group had higher prevalence of late-stage diagnostic (68.58% vs. 52.47%, $p < 0.0001$), and a tumor size bigger than 3 cm (60.54% vs. 51.42, $p = 0.0018$). The young-onset was also more likely to receive chemotherapy and radiation treatments compared with their older counterparts ($p < 0.0001$). Stratified analyses, controlling for race showed that being Black and younger than 50 lowers the probability of getting surgery by 0.46 times the probability of surgery if White and younger than 50 years of age [OR = 0.4625 (0.2423, 0.8827)]. Conclusions: This study confirmed that people younger than age 50 diagnosed with CRC are at a higher risk for late stage diagnosis. The study also emphasized that the relationship between age and treatment patterns differed by race. This study is one of few to explore the characteristics and treatment patterns of young patients with CRC in a specific region. The results of this study may serve as a reference for future studies or CRC screening, and for the development of CRC Interventions programs to target the under 50 population.

B131 How do reversal rates vary among patients with colorectal cancer for which intestinal stoma was performed? Lillian Hang, Henry J Henk. OptumLabs, Eden Prairie, MN, US.

Background: Studies of colorectal cancer (CRC) patients have found patients in whom the intestinal stoma was performed consistently report more impairment and lower quality of life than their non-stoma counterparts. Where possible, the intention is to subsequently reverse the stoma (via stoma closure). The goal of this study is to examine disparities in

stoma reversal (SR) rates among colorectal cancer patients who have health care insurance. Methods: This retrospective cohort study was conducted using medical claims and enrollment records from the OptumLabs Data Warehouse®, which includes commercial and Medicare Advantage (MA) enrollees representing a diverse mixture of ages, ethnicities and geographical regions across the United States. Eligible patients were required to have undergone intestinal ostomy (either colostomy or ileostomy) with an intestinal stoma between 2000 – 2017 as part of their CRC treatment and be enrolled for at least one year prior to and one year following the surgery. A Cox proportional hazard model was used to examine the relationship between patient demographics and clinical characteristics and the rate of SR. Patient demographics include age, sex, race, household income, and rurality. Comorbidity was measured using the Charlson Comorbidity Index score (CCI) excluding the two cancer categories. To further control for difference in health plan design and cost sharing, we included the patients' health plan type (commercial or MA) and if the commercial enrollee was in a consumer driven health plan (i.e., high deductible). Results: We identified 13,633 individuals with colorectal cancer diagnosis between 2000 and 2017 who underwent either a colostomy or ileostomy in which the intestinal stoma was created. The overall SR rate was 16.4% with a median time to reversal of 6 months. The majorities of patients in our study are age 65+ (56%), male (52%), white (77%), and live in a metropolitan area (86%). Excluding cancer, the average CCI was 1.2 ($sd=1.4$) with 84% having CCI < 2 . The cohort had a median follow up enrollment period of 2.5 years. The majority of patient resided in a household with income less than \$75K per year (59%). Prior to controlling for other factors, SR rates were found to be higher in males (19.5% vs 13.1%; $p < .001$) and varying by race ($p < .001$): non-Hispanic whites (21.48%), Hispanic (18.6%), Asian (16.7%) and non-Hispanic blacks (12.8%). Reversal rates ranged from 14.2% for those in households with annual income under \$75K to 22.1% for those above \$125K ($p < .001$). However, after controlling for all factors, SR rates were only lower for females [HR=0.70; 95% CI=0.65, 0.77] and African-American compared to White [HR=0.79; 95% CI=0.68, 0.90]. Household income, rurality and CCI were not found to be independently associated with varying SR. Conclusions: We find variation in SR rates by race and gender independent of age, health plan design, rurality and household income such that women and African Americans are less likely to receive SR.

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B132 Incidence and mortality rate of colorectal cancer in the United States, 2000-2016. Michael Rutalira Koko¹, Rasaki Aranmolate², Stanley Akubue². ¹The University of Southern Mississippi, Hattiesburg, MS, USA, ²Jackson State University, Jackson, MS, USA.

Colorectal cancer (CRC) incidence rate is the third most commonly diagnosed cancer and the second most lethal cancer in both men and women in the United States. CRC is declining rapidly among individuals that are 60 years or older whereas overall mortality rate is increasing in the United States. The purpose of this study is to investigate the CRC incidence and mortality rate by age, race, and gender from 2000 to 2016. We obtained incidence and mortality rate data of Surveillance, Epidemiology and End Results (SEER) program from 2000 to 2016. Annual percent change (APC) was calculated according to age-adjusted incidence and death rate. Among adults aged 60 years and older, the age-adjusted incidence rate declined from 2.4% to 4.0%; however, in individuals younger than 60 years, incidence rate generally increased during the same period. African Americans have the highest incidence rate compared to White (43.8 vs 38.8 per 100,000 in 2016). Age-adjusted death rate significantly increased for African American (13.0 to 31.1 and 6.2 to 21.1 per 100,000) and American Indian/Alaska Native (APC, 1.7% & 3.5%). Additionally, death rate increased for all age groups with APC ranging from 0.2% to 6.2%. Incidence rate declined for both male and female (APC, 2.7% & 2.3%) while mortality rate increased (APC, 2.6% & 2.4%) for both male and female. Further research is needed to investigate the alarming increase in death rate, particularly among African American and American Indian/Alaska Native. More preventive programs should be designed to prevent CRC, especially for African Americans.

B133 Disparities in survival by sociodemographic factors among patients with young-onset colorectal cancer: A population-based study. Maria Elena Martinez¹, Scarlett Lin Gomez², Alison J Canchola², James D Murphy³, Joshua Demb³, Jesse N Nodora³, Samir Gupta³. ¹University of California, San Diego, La Jolla, CA, USA, ²University of California, San Francisco, San Francisco, CA, USA, ³University of California, San Diego, La Jolla, CA, USA.

Background: According to the Surveillance, Epidemiology, and End Results Program, the annual percent change in colorectal cancer (CRC) incidence increased by 3.6% from 2013 to 2016 in individuals less than 50 years of age. Data on survival after young onset CRC diagnosis, including differences by sociodemographic characteristics, are lacking. We assessed differences in CRC survival according

to sociodemographic factors, including race/ethnicity, sex, health insurance type, and neighborhood socioeconomic status (nSES) in patients under the age of 50 years at CRC diagnosis. Methods: The study included male and female CRC cancer cases under 50 years old, diagnosed from 2000-2015 and followed through 2016 in the California Cancer Registry. Analysis included 21,128 patients and 6,269 CRC deaths. Multivariable Cox proportional hazards regression was used to generate hazard ratios (HR) and 95% confidence intervals (CI) for risk of CRC-specific mortality. Multivariable models were stratified by American Joint Committee on Cancer (AJCC) stage (to account for hazard non-proportionality), and adjusted for age at diagnosis, year of diagnosis, race, sex, tumor size, tumor subsite, tumor grade, marital status, insurance status type, NCI-designated cancer center, nSES, neighborhood percent NH black, urban/rural, and clustering by block group. Results: Compared to non-Hispanic Whites (NHW), risk of dying from CRC was higher in Blacks (HR=1.21; 95% CI, 1.09-1.34) but not in Hispanics (HR=0.98; 95% CI, 0.92-1.05) nor Asian/Pacific Islanders (API) (HR=1.03; 95% CI, 0.96-1.11). CRC mortality was lower in female compared to male patients (HR=0.87; 95% CI, 0.83-0.92). Higher CRC mortality was observed for patients on Medicaid (HR=1.41; 95% CI, 1.31-1.50) and those with no insurance (HR=1.32; 95% CI, 1.15-1.52), as compared to privately insured patients. An increase in CRC mortality associated with lower nSES was observed (HR=1.39; 95% CI, 1.25-1.54 for lowest compared to highest statewide quintile; P-trend <0.0001). Conclusion: Results corroborate recent reported disparities in young-onset CRC survival between Blacks and Whites. Our findings further point to higher mortality in patients who are not privately insured and those living in lower SES neighborhoods. Further studies that integrate biological and molecular factors are needed to advance our understanding of CRC mortality in younger patients.

B134 Tumor biology and cancer health disparity: Gene expression, cytokine secretion, and protein production in African American colon cancer cell lines. Marzia Spagnardi¹, Jenny Paredes¹, Jone Garai², Ping Ji³, Ellen Li³, Jovanny Zabaleta², Laura Martello-Rooney¹, Jennie Williams³. ¹SUNY Downstate Medical Center, Brooklyn, NY, USA, ²Louisiana State University Health Sciences Center, New Orleans, LA, USA, ³Stony Brook University, Stony Brook, NY, USA.

Colorectal cancer (CRC) is the third most common cancer among African Americans (AAs) in the US. When compared to Caucasian Americans (CAs), AAs present with higher incidence and death rates as well as worse prognosis after treatment with 5-Fluorouacil (5-FU). Previous studies have

shown a correlation between microsatellite instability (MSI) and response to 5-FU and our recent findings suggest that differences in the tumor immunology and MSI status of AA and CA CRC patients are associated with the observed disparities between these populations. Therefore, we examined if cytokines secretion, protein production and cellular response to 5-FU treatment, differs between colon cancer cell lines from AAs generated in Dr. Williams' laboratory (SB521, SB501 and CHTN06) and colon cancer cell lines from CA patients (HT29 and HCT116). Methods: We performed whole transcriptome sequencing of colon cancer cell lines (RNAseq), utilizing the NextSeq 500/550 High Output Kit v2.5 (Illumina) and Partek Flow data analysis to correlate gene expression to immune-oncology pathways. ELISA assays (RayBiotech) were used to examine the secretion of cytokines in supernatants from cells treated with interleukin 1 β and tumor necrosis factor alpha. We used western blotting for protein detection of the phosphorylated form of c-Jun N-terminal kinases (JNK) as well as cell viability assays for establishing the IC50 of the cell lines to 5-FU. Results: The gene expression results indicated that the immune profiles of AA cell lines differ from CA in genes and cytokines related to cellular anti-tumor activity, including CD8B, IL-1R, IL-1R2, Granzyme B and NFKB. ELISAs of supernatants from CA and AA CRC cell lines revealed a differential cytokines secretion between the two races, namely IL-8. Lastly, the MSI AA cell line showed sensitivity to 5-FU (tenfold less) when compared to the CA cell lines and a distinct protein production pattern. Conclusions: Our gene expression findings demonstrated the differential expression of immunological pathways involved in immune-surveillance and cancer progression in the CRC cell lines between the two races. These results were in accordance with the cytokines' and protein's expression patterns observed in the two cohorts of cell lines. Importantly, our data indicates that 5-FU is more efficient in reducing cell viability in the MSI AA cell line than in the two CA cell lines regardless of their MSI status. Altogether, our results illustrate the value of these in vitro models to study 5-FU treatment in AA patients with MSI and MMR mutations and to elucidate the differences in chemotherapy treatment responses between AAs and CAs. In conclusion, we demonstrated distinct immunological profiles and 5-FU sensitivity of AA and CA CRC cell lines. As such, these differences observed could be used to guide new therapeutic strategies.

B135 Health literacy disparities among Hispanic caregivers of children with newly diagnosed cancer. M. Elena Martinez¹, Paula Aristizabal², Bianca Perdomo³, Nassim Durali³, Shilpa Nataraj³, Jesse Nodora¹. ¹University of California San

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Objective: Health literacy (HL) is the ability to understand process and act on health-related information to function effectively in a healthcare environment. Thirty-six percent of U.S. adults have limited HL and Hispanics have the lowest among all racial/ethnic groups. Individuals with limited HL have higher healthcare utilization and poorer health status. Caregivers of children with cancer must process complex information about the disease to effectively navigate the healthcare system. Research on HL in the pediatric cancer setting is lacking. We assessed HL in Hispanic and non-Hispanic White (NHW) caregivers (primarily parents) of children with newly diagnosed cancer and the correlation of different measures of HL among each other. Additionally, we assessed socio-demographic factors and acculturation levels in Hispanic caregivers as covariates. Methods: Sixty-one caregivers of children with cancer (ages 0-17 y), newly diagnosed at Rady Children's Hospital-San Diego were enrolled. To assess HL, we used the English or Spanish form of the 1) Short-form of the Test of Functional Health Literacy Assessment (S-TOFHLA), 2) Newest Vital Sign (NVS), 3) Parental Health Literacy Activities Test (PHLAT), 4) Rapid Estimate of Adult Literacy in Medicine (REALM) or Short Assessment of Health Literacy for Spanish Adults (SAHLSA-50), and 5) Brief Health Literacy Screen (BHLS). To measure acculturation, we used the Hispanic Acculturation Questionnaire (SASH). Two-sample t-tests, univariate/multivariate linear regression, and Pearson-correlation analyses were used for statistical analysis. Results: Hispanic caregivers had significantly lower HL, as measured by the NVS, than NHWs ($p < 0.001$). In caregivers, lower HL levels (measured by the NVS and S-TOFHLA) were positively correlated with older age ($p < 0.001$), lower education level ($p < 0.001$), informal employment ($p < 0.006$), and Spanish primary language ($p < 0.001$). Additionally, S-TOFHLA was significantly correlated with NVS ($p < 0.001$). The odds of having adequate HL decreased by 94% in caregivers with low acculturation compared to caregivers with high acculturation (95% CI: 83%, 98%, $p < 0.001$). Conclusion: We show significant differences in HL levels between Hispanic and NHW caregivers of children with newly diagnosed cancer. NVS was correlated with S-TOFHLA and could serve as a rapid assessment of HL in the clinical setting for caregivers. Cancer treatment is complex, involving intensive treatments,

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enrollment in clinical trials, and requiring advanced caregiver knowledge about the disease. By identifying caregivers with limited HL, we can help them navigate cancer therapy effectively. Future research should test culture and language-appropriate interventions, including the systematic use of teach-back, pictorial instruction, and patient navigation. Effective HL interventions may improve cancer care for underserved children and help mitigate disparities in outcomes.

B137 Colorectal cancer mortality and disparities in America's 30 most populous cities. [Abigail Silva](#)¹, Nazia Sayad², Fernando De Maio³, Maureen Benjamins². ¹Loyola University Chicago, Chicago, IL, USA, ²Sinai Health System, Chicago, IL, USA, ³DePaul University, Chicago, IL, USA.

Background: In the U.S., colorectal cancer (CRC) is the 2nd leading cause of cancer deaths and Blacks have a 40% higher CRC mortality rate compared to Whites. Reduction in CRC mortality and racial disparities may be achieved, in part, by addressing modifiable factors (e.g. smoking, overweight/obesity, cancer screening availability/uptake, treatment access) and coordinating efforts by civil societies, policy makers, and community leaders. Implementing programs and policy changes at the city level may be the most effective strategy for the U.S. because over 80% of invasive cancer cases occur within urban areas. The purpose of the present analysis is to calculate (and rank) overall and race-specific CRC mortality rates as well as measures of disparities for the 30 biggest U.S. cities. Methods: The 2013-2017 National Center for Health Statistics mortality data and 2013-2017 American Community Survey 5-year population estimates were used to compute the overall, non-Hispanic (nH) Black, and nH White average annual CRC mortality rates for the U.S. and the 30 most populous cities. The rates were age-adjusted using the 2000 standard U.S. population. The Black and White CRC mortality rates were used to calculate rate ratios (RR) and rate differences (RD) and their respective 95% confidence intervals (CIs). In addition, the number of excess deaths due to the racial disparity in CRC mortality was ascertained. Results: The estimated annual CRC mortality rate for the U.S. was 14.3 per 100,000 total population. The city-level rates ranged from a low of 10.6 (San Jose) to a high of 31.1 (Las Vegas). Nationally, the Black rate was 43% higher than the White rate (95% CI: 1.41-1.44) with a RD of 6.27 per 100,000 population. Racial disparities were found in 25 of the 30 cities. Among those with a disparity, Philadelphia had the lowest level (RR=1.21; 95% CI 1.08-1.35, RD=3.55; 95% CI: 1.46-5.63) while Washington DC had the highest (RR=2.60; 95% CI 2.04-3.30, RD=13.65; 95% CI: 10.76-16.54). In the U.S., the

yearly number of excess Black CRC deaths was 2,252. Across the 25 cities with a disparity, Seattle and Portland fared the best while Chicago fared the worst in terms of excess deaths (3 versus 96, respectively). Even among the 12 cities with a lower CRC mortality rate than that of the U.S., 7 had a greater level of disparity (RR>1.43) than the nation. However, some cities like San Diego, New York, Boston, and Oklahoma City fared well in terms of the overall CRC mortality rates and level of disparity. Conclusion: To our knowledge, this study is the first to illustrate the substantial variability in CRC mortality disparities across a sample of urban cities. Local level data helps identify cities that may need the most support and offers examples of model cities. City-level information can be used to assist city officials, public health professionals, cancer control agencies, and other organizations to make real, evidence-based changes in policies, services, and funding.

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C001 Palliative radiation to bony metastases from GI tumors: Disparities, outcomes, and practice patterns. [Jason Hirshberg](#)¹, Charles Hsu², Jared Robbins². ¹Midwestern University, AZCOM, Glendale, AZ, USA, ²University of Arizona, Tucson, AZ, USA.

PURPOSE: To evaluate the use of palliative radiotherapy (pRT) for osseous metastases among patients with gastrointestinal malignancies by sociodemographic factors, tumor type, and survival.

METHODS: The NCDB was used to identify 9297 patients with GI cancers who received pRT to bony metastases from 2004 to 2013. Cancers assessed included esophageal, stomach, pancreatic, hepatocellular (HCC), bile duct & other, gallbladder, colon/sigmoid, and rectal. After excluding incomplete data, 5774 remained for analysis. Strata included age, race, sex, household income, Charlson-Deyo score (CDS), site of bony metastasis, Insurance status, treatment facility type, and distance from treatment site (crow-fly). Outcomes of interest included survival after diagnosis, survival after pRT, completion of pRT, and percent of remaining life spent receiving radiotherapy (PRLSRT). Chi-squared, Kaplan Meier curve with log rank analyses, and Cox Regression evaluated outcomes as a factor of sociodemographics.

RESULTS: Patients were 69% male, 81% Caucasian (CA) and 13% African American (AA). Pancreas, HCC, and Colon/Sigmoid cancers made up 63% of primary tumors. The most commonly used pRT regimen was 30Gy in 10 fractions, and single-fraction 8Gy was increasingly utilized towards 2013. As survival decreased, use of single-fraction pRT increased indicating appropriate pairing of treatment duration to prognosis. This trend was consistent among both AA and CA patients.

AA patients were younger and more likely to live <20mi from their treatment facility compared to CA's. AA's were more likely to have no insurance or Medicaid (9.7% vs 5.3%, or 18.1% vs 8% p<0.05), and have an annual household income below \$30k (37.3 vs 11.4%) compared to CA's. AA's were less likely to have pancreatic cancer. Slightly more AA's completed pRT than CA's (69.2% vs 65.2%, p<0.05), and had longer survival after diagnosis compared to CA (10.2 vs 9.7 months) but shorter survival after pRT suggesting a delay in palliation. Additionally, those who lived 40-60 miles from treatment facility had higher mean survival. Patients with private insurance and those treated at integrated network programs survival advantages.

PRLSRT did not differ by race, but decreased from 2004 to 2013. PRLSRT>50% (p50) did not differ by crow-fly or facility type, but men and those with Medicare were more likely to

have p50. A PRLSRT of 10% or less (p10) was more frequent in those who were treated at an academic facility, lived >60mi away, had private insurance, a lower CDS, or earned \$48-63k/yr in 2012. Sites with more p50 were the spine, skull, and spinal cord. Sites with higher p10 were extremity, shoulder, and ribs.

CONCLUSION: This study evaluated trends of pRT use among patients and stratified analyses by sociodemographic factors. Further research may uncover mechanisms of these trends and highlight potential strategies to optimize the use of pRT.

C002 Racial and geographic variation in knowledge of palliative care among American adults. [Kayanna Jacobs](#)¹, Young Rock Hong², Jiang Bian², Sheri Kittelson², Diana J. Wilkie², Jinhai Huo². ¹Florida Agricultural & Mechanical University, Tallahassee, Florida, USA, ²University of Florida, Gainesville, FL, USA.

Introduction Palliative care provides clinical and economic benefits for patients diagnosed with life limiting illness and their family caregivers. The extent to which variation in knowledge of palliative care exists in racial groups and geographic regions within the United States is not known. The aim of the study was to present the up-to-date data on the knowledge penetration of palliative care by racial and geographic regions. **Methodology** We assessed variations in knowledge of palliative care using the 2018 National Cancer Institute's Health Information National Trends Survey. We used the Pearson chi-square test and multivariable logistic regression models to assess the association of race and having knowledge of palliative care for each census geographic region. The state-level prevalence of no knowledge of palliative care were plotted in a map. **Results** The study population included 3194 respondents (weighted sample size: 229,591,005; median age: 58). About 15 % of the study population was Hispanic, 10% non-Hispanic-Black, and 61% non-Hispanic White. About 84% Hispanic respondents, 75% non-Hispanic Blacks and 65% non-Hispanic Whites had no knowledge of palliative care (P <0.001). For Hispanic, the prevalence of no knowledge of palliative care ranged from 48% in East South Central region to 96% in East North Central and West North Central region. For non-Hispanic Blacks, the prevalence of no knowledge of palliative care ranged from 32% in New England region to 97% in West North Central region. For non-Hispanic Whites, the prevalence of no knowledge of palliative care ranged from 44% in New England region to 78% in Mountain region. Both racial group and census geographic regions were statistically significant variables in the multivariable model predicting no knowledge of palliative care. **Conclusions** In the United States, substantial

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geographic variations in the knowledge of palliative care exist. The prevalence of responders who had no knowledge of palliative care were greater in Hispanic and non-Hispanic Black than non-Hispanic White groups. This finding represents an opportunity for targeted future education to increase the knowledge gap overall and in patients of non-White descent.

C003 Sociodemographic and clinical characteristics associated with worst pain intensity among cancer patients.

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Introduction: Approximately 70% of individuals living with cancer experience persistent pain. Previous studies showed racial/ethnic differences existing across various cancer-related outcomes. Yet, few studies have examined the racial/ethnic differences in worst pain intensity among cancer patients. Thus, the goal of this secondary data analysis was to identify predictors of worst pain intensity, including race/ethnicity, and cancer stage in a diverse sample. **Methodology:** A convenience sample of cancer patients (N=1,516) recruited from cancer centers in the Western and Midwestern United States completed questionnaires collecting demographic, chronic pain, and cancer-specific information. In addition to race and ethnicity, covariates for the linear regression included: other demographic characteristics, tumor stage, cancer type, cancer stage, and substance use. The study outcome, worst pain intensity, was measured on 0 (no pain) to 10 (worst pain) scale and was captured using a validated modified McGill Pain Questionnaire (PAINReportIt). A multinomial generalized linear regression model was utilized to determine associations between selected predictors and pain intensity. Statistical significance was considered at $p < .05$. **Results:** Our study sample was predominantly White (65.0%), Black (24.1%), and Other (10.9%). On average, participants were 58.9 (SD=14.1) years old. Additionally, participants reported a 5.9 (SD=3.0) worst pain intensity score. Selected significant covariates: being non-Hispanic Black ($\beta=0.67$; $P= 0.002$), belonging to an Other racial group ($\beta= 1.04$; $P= 0.0004$), earning less than \$10,000 annually ($\beta=0.77$; $P= 0.0151$), earning between \$10,000 - \$50,000 annually ($\beta= 0.85$; $P= 0.0038$), having toothache pain ($\beta=0.12$; $P= 0.0004$), and having stage 4 cancer ($\beta=0.82$; $P= 0.0007$) were positively associated with worse cancer pain. **Conclusion:** Our analysis suggests that being non-Hispanic Black, a member of an other racial group, low socioeconomic status, having had toothache pain, and having advanced stage cancer are significant predictors of worst

pain intensity among cancer patients. Future studies focused on the management of cancer-related pain should target under-resourced individuals and those with advanced cancer for pain prevention strategies to prevent the escalation of pain intensity. Additionally, future studies should continue to oversample underrepresented Black populations in order to continue assessing disparities in clinical cancer outcomes.

C004 End-of-life care in patients with advanced cancer in an urban safety net hospital.

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Abstract End-of-life care (EoL) in patients with advanced cancer is uniquely challenging in an urban safety net hospital. Low socioeconomic status, poor health literacy and non-congruent language barriers are only a few of the possible challenges that patients can encounter. The purpose of this study was to understand patterns of EoL care for patients with advanced cancer treated at a racially diverse, urban academic safety net hospital. **Experimental Procedures** We performed a retrospective analysis of 308 adult patients with advanced cancer who died between 2012 and 2015. A standardized chart abstraction tool included sociodemographic, clinicopathologic and health services variables. We defined under-utilization of EoL care as no enrollment in hospice or enrollment for three days or less. Aggressive EoL care was defined as 1) receipt of chemotherapy in the last 14 days of life, 2) admission to the intensive care unit in the last 30 days of life, 3) more than one admission (to the hospital or emergency department) in the last 30 days of life, or 4) dying in an acute care setting. **Summary of Data** Among 308 abstracted records, 54% were racial minorities, 63% were not born in the United States, 72% had public health insurance. In all, 48% of cases demonstrated under-utilization of EoL care, and 45% demonstrated aggressive EoL care. A multivariate analysis demonstrated that, after adjusting for other factors, every month of increased survival was associated with a 3% decreased risk of aggressive EoL care and of under-utilization of hospice. We also demonstrate that having a documented healthcare proxy and older age was also associated with utilization of EoL care. **Conclusions** In conclusion, appropriate EoL care is critical for all advanced cancer patients and can be improved for patients seeking care at safety net hospitals. Our study demonstrates that advanced age, having a healthcare proxy, and longer survival from a cancer diagnosis

was associated with improved EoL care. These findings can help to inform targeted interventions to improve EoL care for diverse populations.

C005 Racial differences in painful body surface area (BSA) and pain intensity among hospice cancer patients. [Tanaia Marshall](#), Roach Keesha, Prashant Singh, Yingwei Yao, [Diana Wilkie](#). University of Florida, Gainesville, FL, USA.

Introduction: Although pain is subjective and highly variable between individuals, little is known about the amount of body surface area (BSA) that represents chronically painful locations reported by patients with cancer. The purpose of this study was to explore associations between BSA and demographic, cancer, and other pain variables. Methodology: We used baseline data from a five-step, stepped-wedge randomized clinical trial of cancer patients receiving hospice care. Participants were 259 hospice patients (51% female; mean age 68.4±14.2; 34% Black, 50% White, 14% Other race; 18% Hispanic) who completed PAINReportIt, a measure of pain as a multi-dimensional phenomenon. This computerized software design allowed patients to (a) draw on front and back body outlines where they had pain, (b) select numbers from 0-10 to report their current, least and worst pain intensity in the past 24 hours, and (c) indicate their age, gender, race, ethnicity and type of cancer. We used a novel algorithm with the ImageJ software to calculate the BSA from the digital pain drawings and the R statistical program to conduct descriptive, correlational, and ANOVA analyses. Results: The other race group included 2 Asians, 35 Hispanics and 5 non-Hispanic Other. The three largest painful BSAs for a body region were located in the abdomen (12.0%±18.8%), lower back (6.8%±12.6%), and upper back (4.2%±9.3%). Patients' average pain intensity scores were: Now (4.7±2.6), Least (3.2±2.4) and Worst (7.0±2.4). Differences by race were noted for the total BSA (p=.03), pain now (p=.02), and pain worst (p=.03). Blacks reported the lowest total BSA, Whites the lowest pain now and worst pain, and the Other racial group the highest total BSA, pain now and pain worst. With Bonferroni adjustment, Other and Black differed on BSA (p=.02) and Other and White differed on pain now (p=.05). Total BSA was significantly correlated with pain now (r=.17, p=.01), pain least (r=.15, p=.02), pain worst (r=.24, p<.001), and the number of sites (r=.31, p<.001). Total BSA was not significantly associated with type of cancer, but regions with highest total BSA were consistent with primary cancer site. Conclusion: Our sample included a large number of patients from minority groups. Based on known disparities in pain control between Blacks and Whites, our findings are surprising. Findings may reflect culturally competent care

that still requires greater attention to reduce the severity of worst pain. Reasons for differences in pain dimensions by racial groups and not for the type of cancer are unclear from our initial study of BSA among patients receiving hospice care. In the future, studies are needed to understand these differences and explore if other pain dimensions like pain quality and pain pattern differ by race and ethnicity, since individuals identifying as Hispanic had the highest BSA and pain intensity.

C006 Underutilization of palliative care in metastatic foregut cancer patients is associated with socioeconomic disparities. [Michelle Ju](#), Subhadeep Paul, Adam Yopp, Sam Wang, [Matthew Porembka](#). UT Southwestern, Dallas, TX, USA.

Introduction: Metastatic cancers of the foregut are frequently associated with debilitating symptoms that negatively impact quality of life. We aim to determine the rate of palliative care (PC) use in metastatic neoplasms of the foregut and the factors which are associated with receipt of PC. Methods: Using the National Cancer Database (NCDB), patients with metastatic cancers of the foregut were selected. Receipt of PC as defined by the NCDB participant use file was correlated to demographic and clinicopathologic factors. PC treatment included surgery, radiation, systemic therapy, and pain management to alleviate symptoms. Logistic regression was performed to assess the impact of factors on the likelihood of receiving PC. Overall survival was estimated using the Kaplan-Meier method and compared using log-rank tests. Results: Between 2004 and 2013, 277957 patients with metastatic foregut cancers (MFC) including gastric (42626, 15.3%), pancreas (109219, 39.2%), bile duct (8890, 3.2%), gall bladder (10058, 3.6%) and esophagus cancer (107164, 38.6%) were identified. Median age was 66 years (IQR: 55-76 years) and 64% were male. Among all cancer types, PC utilization was 14.7% (40787). PC utilization increased over time (2004-6 12.3%, 2007-10 14.7%, 2011-13 16.4%; p<.001). PC utilization was different between cancer types [gastric 6965 (16.3%), pancreas 18814 (17.2%), bile duct 1922 (21.6%), gall bladder 1593 (15.8%) and esophagus cancer 11493 (10.7%)]. There were differences in types of PC interventions utilized in the entire group: surgery 6569 (16.1%), radiation 6964 (17.1%), systemic therapy 12951 (31.8%), pain management 5100 (12.5%) and combination therapy 9203 (22.6%). Factors associated with PC on univariate analysis included sex, race, insurance status, median income, education level, Charlson/Deyo comorbidity score, and year of diagnosis (all p<.01). On multivariate analysis, female gender (1.09, 95% CI: 1.06-1.11), higher education level (Level 4: 1.36, 95%CI: 1.31-1.42), higher Charlson/Deyo Score (Score:

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2: 1.28, 95%CI: 1.23-1.32), and a later year of diagnosis (2011-2013: 1.39, 95%CI: 1.35-1.43) were associated with greater receipt of PC. Furthermore, older patients (75+ years: 0.90, 95%CI: 0.85-0.96), HS race (0.78, 95%CI: 0.74-0.82), private insurance (0.80, 95%CI: 0.76-0.85) and higher income (0.78, 95%CI: 0.75-0.81) were associated with less receipt of PC. Overall survival for the entire cohort is poor at 4.45 months ($p < 0.001$) for the PC group and 6.60 months ($p < 0.001$) for the no PC group. Conclusion: Although PC use has increased over time, it remains underutilized in MFC. Disparities exist in receipt of PC in regard to age, race, gender, insurance status, education, comorbidities and year of diagnosis. Additional research is necessary to better optimize PC use in metastatic cancers of the foregut and mitigate potential disparities.

C007 Racial differences in feasibility and perceived value of electronic symptom monitoring in a cohort of Black and White bladder and prostate cancer patients. Cleo

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Background Racial differences in cancer-related symptom burden are well-documented, and partly linked to inequities in symptom monitoring. Electronic patient-reported outcomes (ePROs) are useful for symptom monitoring, but have rarely been evaluated in diverse patient populations. We implemented an ePRO tool among a cohort of Black and White cancer patients and evaluated (1) whether ePRO use was perceived as feasible and valuable for symptom management; and (2) if perceptions of feasibility and value differed by race. Methods We recruited 30 Black and 50 White bladder and prostate cancer patients from a single institution. Participants completed ePRO assessments prior to, during, and 3 months following completion of cancer treatment. Participants were given the option of reporting symptoms using a web- or phone-based system. A subset of participants completed end-of-study satisfaction surveys (n=9 Black; n=25 White) and qualitative interviews (n=15 Black; n=25 White) assessing ePRO feasibility and value. We analyzed end-of-study surveys and qualitative interview data, evaluating race-specific differences in user experiences with the ePRO tool. Results Both Black (77.8%) and White (96.0%) participants more commonly reported using the web-based system for symptom reporting, with the majority of participants reporting being “very satisfied” with the web-based system (71.4% Black; 66.7% White). Whites more commonly reported high levels of ease in understanding and answering symptom assessment items compared with Blacks (44.4% Black; 56.0% White). In interviews, Blacks expressed stronger preferences for phone-based and paper-based reporting due to ease in facilitating understanding of symptom items. In terms of perceived value, Blacks more often reported that the ePRO tool was “very helpful” in reminding them of symptoms experienced in the last seven days (55.6% Black; 36.0% White). In interviews, Blacks also described how the ePRO helped them better understand symptoms, while Whites noted finding value in better understanding symptoms and the ability to track their symptoms over time. Black and White respondents commonly reported that doctors communicated with them about ePRO-reported symptoms (88.9% Black; 84.0% White), but Blacks more often reported that the ePRO tool was “very helpful” in speaking to doctors about symptoms (44.4% Black; 24.0% White). In interviews, both Black and White participants indicated that ePRO use prompted more in-depth discussions about symptoms and treatment options with providers. Conclusion Electronic symptom monitoring is perceived as valuable among Black and White cancer

patients. Greater perceived value of ePROs among Blacks may have implications for addressing systemic drivers of symptom disparities. As oncology practices move towards broader implementation of ePROs, it will be important to consider the health literacy needs and ePRO modality preferences of patients, in order to promote equitable adoption of electronic symptom monitoring.

C008 Pharmacokinetic analysis of vincristine and its m1 metabolite in Kenyan pediatric cancer patients through co-modeling. [Lorita Agu](#)¹, Jamie Renbarger², Diana S-L.

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Objectives: The aim of this study was to develop a pharmacokinetic (PK) model that can determine the PK of vincristine (VCR) and its M1 metabolite using concentration data from Kenyan pediatric cancer patients. VCR is one of the most widely used anticancer agents in treating a variety of malignancies in pediatric oncology. Regardless of its extensive pediatric use, dosing strategies for VCR are largely empirical as there is little information about its disposition and optimal therapeutic dosing. Our collaborator, Dr. Jamie Renbarger and her group have reported that CYP3A5 enzyme generates the major VCR metabolite, M1, more efficiently than CYP3A4 enzyme. This finding maybe clinically significant because CYP3A5 expression varies with up to 90%, 70% and 10-20% of expressions in Kenyans, African Americans and Caucasians, respectively. Therefore, it is crucial to monitor M1 and characterize its disposition in humans to provide an insight of inter-ethnic variability in VCR metabolism and clearance. Methods: Kenyan pediatric cancer patients (8 males:8 females, age range: 1-13 years, weight range: 7.0 - 36.6 kg, body surface area: 0.36 - 1.24 m²) were intravenously administered with VCR (delivered dose, 0.4 - 2.5 mg). Blood samples were collected using human dried blood spot (DBS) collection paper via finger prick at various time points depending on the feasibility and duration of patient stay for care in the hospital. Using a developed LC-MS-MS assay, the concentrations of VCR and M1 were measured from patient DBS samples. A PK compartmental model was developed through co-modeling of VCR and M1 using Phoenix (version 8.0). The model was selected based on comparison of quality of fit plots and on the likelihood ratio test on the difference of criteria (-2LL). Results: The best fit structural model for VCR and its M1 metabolite was established. The model consists of a one-way metabolite formation transfer from VCR to M1 compartments. Good correlations were observed between observed and predicted values of VCR and M1 in the subjects used. The best-fit PK parameter estimates were

derived from the PK compartmental model. In one subject, values estimated for PK parameters that only our study could derive include: conversion rate constant from VCR to M1 of 0.04 1/hr, M1 metabolite volume of distribution of 51.49 L, and M1 metabolite elimination rate constant of 0.44 1/hr. Conclusion: For the first time, a compartmental PK model that could determine the PK parameters of VCR and its M1 metabolite from DBS samples through co-modeling was developed. The model resulted in a good fit for the subjects used. The model will be validated after further adjustments and could potentially be used to rationally modify future VCR dosing regimen for Kenyan pediatric patients. Further, this modification could be possibly extrapolated for African American pediatric patients. Additionally, using our validated model, we will characterize and predict the population PK of VCR and its M1 metabolite among different ethnic groups.

C009 Post-diagnostic statin and metformin use and risk of biochemical recurrence risk among Black and White men diagnosed with prostate cancer at the Veterans Health Administration. [Saira Khan](#)¹, Bettina Drake². ¹University of Delaware, Newark, DE, U.S., ²Washington University in St.

Louis School of Medicine, St. Louis, MO, USA.

BACKGROUND: Prostate cancer is the most common cancer among men in the United States. Black men represent a high-risk group that is more likely to be both diagnosed with and experience adverse prostate cancer outcomes. Both statins (to reduce cholesterol) and metformin (to treat diabetes) have been hypothesized to reduce the risk of biochemical recurrence (BCR), a clinically important outcome, among men with prostate cancer. However, few studies have examined this association specifically in Black men. Because Black men are at greater risk for adverse prostate cancer outcomes, the potential of commonly used medications, including metformin and statins, to reduce this increased risk needs to be investigated. Here, we have examined the potential of metformin and statins to reduce risk of prostate cancer recurrence in a racially-diverse cohort of men diagnosed with prostate cancer at the Veterans Health Administration (VHA). METHODS: Our cohort consisted of 20,359 Black and 52,004 White men that were diagnosed with prostate cancer between 1997-2009 at the VHA and received definitive treatment for prostate cancer (radical prostatectomy or radiation). Statin use and metformin use were defined as any statin or metformin prescription after prostate cancer diagnosis. BCR was defined using established definitions. (For men treated with radical prostatectomy, BCR was defined as a PSA of 0.2 ng/mL or higher for two consecutive assays without treatment. For men treated with radiation,

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BCR was defined as rise of 2 ng/ mL or more above the nadir achieved after radiation therapy.) Cox proportional hazard models adjusted for age at diagnosis, prostate cancer grade, prostate cancer stage, and locale (rural vs. urban) were used to assess the association between statin and metformin use. Statin and metformin use were analyzed in separate models, stratified by race. RESULTS: Statin use (69.9% of Black men; 75.4% of White men) and metformin use (29.4% of Black men; 24.3% of White men) were prevalent in our cohort. The mean BCR-free survival time was 5.7 years and 6.0 years in Black and White men, respectively, with 16.6% of Black men and 13.8% of White experiencing a BCR. Statin use was associated with a significantly reduced risk of BCR in the cohort as a whole (Hazard Ratio (HR): 0.87; 95% Confidence Interval (CI): 0.83, 0.91), Black men (HR: 0.84; 95% CI: 0.77, 0.90), and White men (HR:0.89; 95% CI: 0.84, 0.95). We observed no association between metformin use and risk of BCR [Overall (HR: 1.05; 95% CI: 1.00, 1.10), Black men (HR: 1.00; 95% CI: 0.93, 1.08), White men (HR: 1.05; 95% CI: 1.00, 1.11)]. CONCLUSION: Post-diagnostic statin use may reduce the risk of BCR in both Black and White men. This is one of the few studies to examine statin use and metformin use specifically in Black men with prostate cancer. Importantly, because all patients treated at the VHA receive care regardless of insurance status, this study was able to control for socioeconomic status in ways other studies are unable.

C010 African Americans' adherence to survivorship. Roberta A. Albany. Independent Advocate, Mt. Penn, PA, USA.

Looking at data that support issues regarding African Americans not adhering to their taking prescribed medications and following up on their treatment care plans. There's a need to understand the stigma and social economic/class with regards to poor follow-up on survivorship care plans and we can bridge the gap in the African American communities and health care providers.

C011 The effects of a culturally tailored lifestyle intervention on quality of life in African-American breast cancer survivors. Lola Awoyinka¹, Lisa Sharp², Alexis Visotcky¹, Anjishnu Banerjee¹, Patricia Sheehan³, Melinda Stolley¹. ¹Medical College of Wisconsin, Milwaukee, WI, US, ²University of Illinois at Chicago, Chicago, IL, US, ³Loyola University Chicago, Chicago, IL, US.

Background. African-American Breast Cancer survivors (AABCS) report long-term challenges with weight gain, symptom burden, fatigue and overall physical and mental quality of life (QOL) following breast cancer treatment.

Lifestyle interventions supporting weight loss, improved diet and physical activity patterns document reduced symptom burden and fatigue, and improved QOL. Most studies, however, do not include diverse samples. The Moving Forward randomized trial examined the effects of a weight loss intervention among 246 AABCS on multiple outcomes including quality of life. We will also examine correlates associated with improved QOL. Methods: 246 AABCS were randomized to either a 6-month interventionist-guided (IG) or self-guided (SG) program. The IG-program included twice weekly classes with supervised exercise that addressed strategies to improve diet, be more active and lose weight. Participants also received bi-weekly supportive text messages. This program was held in partnership with the Chicago Park District in eight predominately AA Chicago neighborhoods. The SG-program received a program binder with the same information offered in the IG group. Measures were collected at baseline, 6-mos and 12mos and included: PROMIS-10 QOL, the Brief Fatigue Inventory, Results: Women in the IG group (n=125) lost significantly more weight than those in the SG (n=121) group (-3.49kgs vs -1.27kgs, p<0.0001) and % weight loss (3.6% vs 1.4%, p=0.001) at 6 mos. Post-intervention, PROMIS scores were significantly higher than those in the SG group (n=101) for the mental (p=0.024) and physical (p=0.016) scales. The magnitude of improvement from baseline to 6 months for both mental (p=0.006) and physical health scores (p<0.001) was also significantly higher in the IG group. At 12 months there were no longer significant difference between groups, however the change from baseline remained higher for the IG group for mental (p=0.067) and physical measures (p=0.004). IG also reported lower fatigue post-intervention (p<0.0001) compared to SG. Conclusions: This study suggests that a culturally tailored lifestyle intervention can improve physical and mental quality of life and proposes that these improvements can be maintained beyond the intervention period. Additional analyses will explore potential correlates of QOL improvements including weight loss, self-efficacy and social support.

C012 Impact of racial differences in financial burden on health-related quality of life. Wendi Elkins¹, Olive Mbah¹, Jeannette T Bensen², Laura Farnan³, Neda Padilla³, Sam Cykert⁴, Bryce B. Reeve⁵, Giselle Corbie-Smith⁶, Cleo A. Samuel⁷. ¹Gillings School of Global Public Health, UNC-Chapel Hill, Chapel Hill, NC, US, ²Lineberger Comprehensive Cancer Center, Gillings School of Global Public Health, UNC-Chapel Hill, Chapel Hill, NC, , ³Lineberger Comprehensive Cancer Center, Chapel Hill, NC, , ⁴Division of General Medicine and Clinical Epidemiology, UNC-Chapel Hill, Chapel Hill, NC, ⁵Department of Population Health Sciences, Duke

University School of Medicine, Durham, NC, , ⁶Department of Social Medicine and Department of Medicine, Center for Health Equity Research, UNC-Chapel Hill School of Medicine, Chapel Hill, NC, , ⁷Department of Health Policy and Management, Gillings School of Public Health and 2) Lineberger Comprehensive Cancer Center, UNC-Chapel Hill, Chapel Hill, NC, .

Background Racial disparities in health-related quality of life (HRQOL) are well-documented, and recent studies have reported racial differences in financial burden; however, little is known regarding the contribution of financial burden to racial disparities in HRQOL. The objective of this study was to examine whether racial differences in financial burden explain racial disparities in HRQOL among a cohort of cancer survivors. **Methods** We used cross-sectional data on cancer patients and survivors enrolled in the University of North Carolina Health Registry/Cancer Survivorship Cohort (HR/CSC). We limited the study cohort to self-reported non-Hispanic White and Black participants with a diagnosis of breast, genitourinary, gastrointestinal, or head or neck cancer who completed a questionnaire at least 30 days following their diagnosis (N=2,123). HRQOL was measured through the Functional Assessment of Cancer Therapy-General and financial burden was assessed using the Patient Satisfaction Questionnaire-18 (satisfaction with the financial aspects of care, >3.5 is satisfied; <=3.5 is unsatisfied). To assess racial differences in HRQOL, we estimated unadjusted and adjusted OLS regression models, accounting for patient clinical and demographic characteristics. **Results** In the first model predicting HRQOL as a function of race and clinical factors only, Black race was associated with a 3.6 point decrease in HRQOL scores ($p=0.001$). In the second model adjusting for the above-mentioned covariates in addition to financial burden, the absence of financial burden was associated with an increase in HRQOL scores ($\beta=7.1, p=0.000$). In the final fully adjusted model adjusting for race, clinical factors, financial burden as well as sociodemographic characteristics, the absence of financial burden was associated with an increase in HRQOL scores ($\beta=7.1, p=0.000$) and Black race was no longer significantly associated with HRQOL ($\beta=-0.8, p=0.475$). **Conclusions** Financial burden is strongly associated with HRQOL and alleviating financial burden of cancer survivors may be able to address racial differences in these outcomes. Additional research is needed to disentangle the unique financial challenges faced by Patients of Color. Furthermore, efforts aimed at reducing financial toxicity in cancer patients must prioritize equity in order to prevent further exacerbation of disparities in HRQOL and other cancer care outcomes.

C013 Accuracy of self-reported PSA levels is associated with better mental health in disadvantaged men with prostate cancer.

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Introduction and Objective The Improving Access, Counseling and Treatment for Californians with Prostate Cancer (IMPACT) Program has provided free prostate cancer treatment and care navigation services for uninsured, low-income men in California since 2001. An integral part of this program is prostate cancer education around monitoring prostate-specific antigen (PSA) values. Prior work has demonstrated increasing accuracy of self-reported PSA values over time in this cohort. We aim to evaluate the relationship between PSA-accuracy, and general and prostate-cancer related quality of life (QOL). We hypothesize that men with accurate self-reported PSA levels would have better self-reported physical and mental health compared to men with inaccurate self-reported PSA levels. **Methods** We abstracted participants' self-reported and laboratory PSA levels, RAND 12-item short form survey (mental, physical, and general health) and UCLA Prostate Cancer Index (prostate cancer-related QOL) answers at time of IMPACT enrollment and 6, 12 and 18 months thereafter. Controlling for prostate cancer characteristics and treatment, overall health, and patient demographics, we used multivariate analysis to compare baseline QOL measures, and mixed effects models to compare trends in QOL over time between men who accurately and inaccurately self-reported PSA levels. Accuracy was defined to be an exact match between self-reported and laboratory PSA levels. **Results** At time of enrollment, men who accurately self-reported PSA levels were older (mean age 60 vs 58 $p=0.04$), had less education ($p=0.03$), were less likely to be English speakers ($p=0.05$), and had higher mental health scores ($p=0.03$) compared to men who inaccurately self-reported PSA levels. In our multivariate analysis, men with accurately self-reported PSA levels had significantly higher mental health scores ($p=0.04$) than men with inaccurately self-reported PSA levels. Men who identified as 'white' reported significantly higher mental health scores than men who identified as 'non-white' ($p=0.02$). Next, men were categorized into groups based on the accuracy of their self-reported PSA levels over time: accurate to accurate (referent group, $n=31$) and inaccurate to accurate ($n=19$). Men with improved accuracy of self-reported PSA levels (inaccurate to accurate) reported improved mental health but worse physical health over time, while men who started with and maintained accurately self-reported PSA levels reported improved mental and physical health over time. Trends in prostate-cancer QOL were similar regardless

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of self-reported PSA accuracy. Conclusions Inaccurate baseline self-reported PSA levels are associated with poorer mental health. Improving accuracy of self-reported PSA levels correlated with better mental health scores and worse physical health scores over time. The link between understanding one's disease and perceived health requires further clarification. Funding: IMPACT is supported by California Department of Health Services

C014 Perspectives of cervical cancer (CC) survivors. Gail Petersen Hock. National Cervical Cancer Coalition, Phoenix, AZ, USA.

This poster shares perspectives of cervical cancer (CC) survivors related to the information they received about how their diagnosis and treatment may impact their sexual health. Mick, Hughes, & Cohen's (2004) BETTER model was modified into an electronic survey format. The study (n = 89) had 15 variables and two open ended questions. Independent variables were: Age (current and at diagnosis); CC stage; Race; Ethnicity; Insurance status at diagnosis; Educational completion; and Urbanicity. Participants also reported independent variables related to provider gender and type. Dependent variables were five modified BETTER model questions and a question regarding the offer of fertility options following treatment. Open ended questions on the social/cultural impact of diagnosis and the opportunity to share any questions they wished they had asked were included adding depth to the closed ended questions. Outcomes revealed three significant findings. 1) Of respondents reporting that their provider did not explain that they could discuss any concerns during their treatment more than half, of respondents, fell at the lower end of the educational level. 2) There was an association between provider gender and offers of information about fertility preservation. 3) Female providers were 31% more likely to offer fertility information. Although not statistically significant, nearly 50% of the CC survivors reported that issues in the sexual domain were not introduced during discussion of treatment options. This study supports use of the BETTER model as a teaching tool in oncology practices facilitating quality patient centered care by reducing gaps in addressing sexual domain issues related to treatment options. Ultimately, participant perspectives' will be used to modify public domain educational materials used in oncology practices and cancer support organizations to reflect a more patient centered approach to health in the sexual domain.

C015 Cardiovascular disease and health-related quality of life among African American and white cancer survivors.

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Background: Cardiovascular disease (CVD) is common among cancer survivors and is a leading cause of death among survivors of several forms of cancer. Race disparities exist in the prevalence of several forms of CVD, and these may have implications for the health-related quality of life (HRQOL) of cancer survivors. The current study estimates the association between several forms of CVD and HRQOL among a diverse cohort of cancer survivors. Methods: This analysis was conducted using data from 979 participants (574 African American, 405 white) with female breast, colorectal, lung, or prostate cancer in the Detroit Research On Cancer Survivors (ROCS) pilot study who were diagnosed and/or treated at the Karmanos Cancer Center in Detroit, Michigan. The analyses were conducted using linear regression with binary measurements of five different forms of CVD included in the ROCS pilot survey (self-reported history of congestive heart failure (CHF), myocardial infarction (MI), hypertension, peripheral vascular disease (PVD), and stroke) as predictors of HRQOL measured using the Functional Assessment of Cancer Therapy – General (FACT-G), controlling for demographic, socioeconomic, and cancer-related characteristics. We also tested for effect modification by race. Results: FACT-G scores were 2.2 (95% CI: -4.3, 0.0) points lower among cancer survivors who were diagnosed with any type of CVD compared to those who were not. This association did not differ by race ($P_{\text{interaction}}=0.25$). FACT-G scores were somewhat lower among survivors diagnosed with hypertension [-1.9; 95% confidence interval (CI): -4.1, 0.1], MI (-4.1; 95% CI: -8.4, 0.2), CHF (-3.7; 95% CI: -8.2, 0.9), or stroke (-4.0; 95% CI: -8.5, 0.5); however, the magnitude of these differences was not clinically meaningful and the findings did not reach statistical significance. History of MI was associated with clinically meaningful differences in HRQOL among African American (-6.1; 95% CI: -11.3, -0.8) but not white survivors (-0.4, 95% CI: -7.9, 7.2; $P_{\text{interaction}}=0.15$). Conclusions: Overall, any type of CVD was not associated with meaningful differences in HRQOL among cancer survivors. Our finding that history of MI was associated with clinically meaningful differences in HRQOL among African American survivors, but not white, could represent an opportunity for future efforts to improve survivors' HRQOL.

C016 Qalys and dalys are better with concurrent chemoRT than induction chemo followed by chemoRT in nasopharyngeal carcinoma. [Mary R Nittala](#), Madhava R Kanakamedala, Eswar K Mundra, Srinivasan Vijayakumar. University of Mississippi Medical Center, Jackson, MS, USA.

Purpose: As survival alone does not give a holistic view on the complete picture associated with outcomes of a treatment, the main purpose of this study is to interpret the evidence of quality adjusted life year (QALY) and disability adjusted life year (DALY) on the outcomes of the nasopharyngeal carcinoma patients (NCP) treated with definitive chemo radiation therapy (chemoRT) with or without neoadjuvant induction chemotherapy. Methods: Retrospective analysis of 85 NCPs treated by concurrent chemoRT (60 %), induction chemo followed by concurrent chemoRT (23.5 %) and hospice (16.5 %) at an academic state institution. Overall survival (OS) was estimated by using Kaplan-Meier method and the differences between survival curves were calculated by log-rank test. The SPSS 24.0 software was used for data analysis. QALYs are calculated by multiplying the utility value associated with a given nasopharyngeal carcinoma phase by the years lived in that state. DALYs are calculated by combining measures of life expectancy (LE) and the adjusted quality of life during the disease phase. The relationship between QALYs gained and DALYs saved were calculated from age of the disease onset, duration of the disease, quality of life and disability weights. Results: Of the total 85 eligible NCPs of this cohort, the frequency distribution as per WHO classification was for keratinizing SCCa (Type I) 41.2 %, non-keratinizing SCCa (Type II) 42.4 % and undifferentiated carcinoma (Type III) 16.5 %. The OS median follow up for this cohort was 24 months. WHO Type I had OS of 48.6 %, Type II 29 % and Type III 39.7 % (P = 0.042). The OS of concurrent chemoRT was 32.8 % and induction chemo followed by concurrent chemoRT 14.8 % (P = 0.029) Average LE for 85 NCP cohort is 34.56 years, average DALYs saved with treatment is 20.06 years and average QALYs gained with treatment is 11.72 years. The average DALYs saved with concurrent chemoRT is 12.2 years vs 5 years with induction chemo followed by concurrent chemoRT. The average QALYs gained with concurrent chemoRT is 6.9 years vs 3.1 years with induction chemo followed by concurrent chemoRT. Summary and Conclusion: This study is significant for the following: 1. This study uses QALYs and DALYs calculated not by using survey forms but alternative methods. 2. It shows that concurrent chemoRT is superior to induction chemotherapy followed by concurrent chemoRT using outcomes based on QALYs and DALYs. Our retrospective cohort OS reports similar findings to previous studies by Liang et.al and Tan et.al, that induction chemo has

not shown to improve OS compared to definitive chemoRT. In addition, our data show that patients treated with concurrent chemoRT had an increased quality of life when compared to the patients treated with induction chemo followed by concurrent chemoRT. The average DALYs saved are higher in the patients treated with concurrent chemoRT over patients treated with induction chemo followed by concurrent chemoRT.

C017 The Patient COUNTS Study: Patient Cancer Outreach, Navigation, Technology, and Support. [Salma Shariff-Marco](#)¹, Debora Oh², Janice Tsoh², Ching Wong², Laura Allen², Janet Chu², Hoan Bui², Corina Liew², Angela Sun², Joyce Cheng², Lei Chun Fung², Scarlett Lin Gomez², Tung Nguyen². ¹UCSF, San Francisco, USA, ²USCF, San Francisco, USA.

Background: While cancer is the most common cause of death for Asian Americans, many Asian American cancer patients do not receive appropriate treatment nor supportive care. The Patient COUNTS project aims to provide these patients and their caregivers with accessible, culturally-relevant, and linguistically-appropriate navigation resources that utilize technology to reduce disparities and improve quality of life. Methods: With feedback from a Patient Advisory Council and focus groups with cancer patients and caregivers, we developed a patient navigation program for Asian Americans that is currently being pilot tested with patients in Northern California. We are also developing an online patient portal that will enable newly diagnosed colorectal, liver, and lung cancer patients to access appropriate resources and virtual navigation. The portal and navigation will be available in English, Chinese (Cantonese/Mandarin), and Vietnamese, with ability to collect patient-generated health data (e.g., quality of life) and provide tailored resources and navigation. Results: We conducted 4 focus groups and 3 individual interviews with 17 participants in 4 languages (English, Mandarin, Cantonese, or Vietnamese). Key emerging themes include: 1) information unawareness or overload; 2) emotional support; 3) navigation needs; and 4) resource access. Participants with limited English proficiency often did not know to ask or what to ask for regarding their diagnosis or treatment. Some, however, were confused and overwhelmed by the amount of information from many sources. Receiving encouragement to fight cancer was described as crucial in their cancer care; family, friends, doctors, nurses or hospital staff were the primary sources of such emotional support. Although most participants were unfamiliar with navigation, they thought it was very desirable once an explanation was provided. Participants wanted information on symptoms and

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side effects management. They recommended providing information on sensitive topics (e.g., stigma, dying) only when asked by the patient. Access to information in both their native language and English are important for their comprehensive and communication with others. For participants with end-stage disease, information on palliative care and clinical trials should be provided. These findings guided the development of our patient navigation program to provide information on cancer, treatment, living with cancer, emotional well-being, resources (access to health care, financial, transportation, housing, food and nutrition, child/adult care). Conclusions: Our formative research found significant needs among Asian American cancer patients and suggestions for how to address those needs. Implementing the in-person pilot and online portal will enable us to identify key elements of an effective, sustainable, and disseminable navigation program for Asian American cancer patients and their caregivers.

C018 Racial disparities in health care utilization at the end of life among New Jersey Medicaid beneficiaries with advanced cancer. [Annie W Yang](#)¹, David Goldin², Jose Nova², Jyoti Malhotra³, Joel Cantor², Jennifer Tsui³. ¹Rutgers New Jersey Medical School, Newark, NJ, USA, ²Rutgers Center for State Health Policy, New Brunswick, NJ, USA, ³Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA.

PURPOSE: Quality of cancer care experienced by Medicaid beneficiaries near the end-of-life (EOL) is not well understood. Measures endorsed by national organizations discourage aggressive EOL care and encourage timely referrals to hospice care. We sought to 1) assess the prevalence of aggressive EOL care and hospice enrollment for Medicaid beneficiaries with advanced cancer, and 2) determine whether racial/ethnic disparities exist in patterns of EOL care. **METHODS:** We used a New Jersey State Cancer Registry-Medicaid claims linked dataset to identify Medicaid beneficiaries (ages 21-64) diagnosed with stage IV breast and colorectal cancer from 2011-2015 and died by January 2016. We measured aggressive EOL care using the four measures: >1 hospitalization, >1 emergency department (ED), any intensive care unit (ICU) admission in the last 30 days before death; receipt of chemotherapy in the last 14 days before death; and a composite measure for "any aggressive care" using the four measures described. We measured hospice enrollment after diagnosis, and hospice enrollment in the last 3 days of life. We used descriptive statistics and multivariate logistic regression models to assess the relationship between race/ethnicity and outcome measures (i.e., rates of aggressive EOL care and hospice use). We adjusted for sex, age at

diagnosis, year of diagnosis, length of survival, cancer type, comorbidities, and Medicaid managed care status. **RESULTS:** We identified 349 patients diagnosed with stage IV breast and colorectal cancer. More than half (56%) identified as a racial/ethnic minority, including 33% Non-Hispanic (NH) Blacks, 18% Hispanics, and 5% NH-Asian Pacific Islanders. Nearly two-thirds of patients (62%) received at least one measure of aggressive EOL care. Almost one-third had >1 hospitalization (27%), >1 ED visit (31%), or were admitted to the ICU (30%) in the last 30 days of life; or received chemotherapy (34%) in the last 14 days of life. Compared to NH-Whites, NH-Blacks had higher odds of receiving any aggressive EOL care (aOR 1.87, 95% CI: 1.08-3.26), >1 hospitalization (aOR 1.98, 95% CI: 1.13-3.47), and >1 ED visit (aOR 1.79, 95% CI: 1.05-3.06), after adjusting for other demographic and tumor characteristics. Among all patients, only 39% of patients enrolled in hospice, while 14% enrolled in hospice in the last 3 days of life. No significant differences in hospice enrollment were observed by race/ethnicity in the multivariate models. **CONCLUSION:** The majority of Medicaid patients with advanced cancer received aggressive EOL care and did not enroll in hospice. Although all patients in our study were Medicaid beneficiaries, NH-Blacks were twice as likely to receive aggressive EOL care compared to NH-Whites. These racial/ethnic disparities suggest further work is warranted, particularly in larger datasets with greater numbers of diverse cancer patients, to understand the multilevel processes beyond socioeconomic or health insurance status, that lead to suboptimal EOL care.

C019 The battle of multiple myeloma means impeccable strength. [Yolanda Brunson Sarrabo](#). Independent Advocate, East Stroudsburg, PA, USA.

The battle of multiple myeloma means impeccable strength is- The Battle=Though the disease has our bodies captive and our minds unsure of the future. We're stuck in how do we move forward, as the writing seems to be clear on the wall. We see death immediately. Impeccable Strength= Once the cries and whys are taken care of that a patient calls on their inner core and strength to bring them to a different mindset. This journey may be different like no other, and a revelation of what you're really made of is about to take center stage. The time to be a warrior is now with dignity and grace.

C020 Racial differences in the risks of second primary gynecologic cancers following chemotherapy for malignant ovarian tumors: Asian subgroups in the United States, 2000-2016.

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Objective: The incidence of ovarian cancer in the United States varies by race with the highest rates among white women but lower survival observed among black women and other racial and ethnic groups. These disparities in outcomes among women with ovarian cancer are not well understood, including the differential occurrence of second primary cancers according to race. Our objective was to measure racial differences in incidence of second primary gynecologic cancers (SPGC) among women with malignant ovarian tumors following treatment with chemotherapy. Specifically, we aimed to determine differences in SPGC incidence by Asian ethnic subgroups in the United States. Methods: We conducted a retrospective cohort study of women ages 20 years and older diagnosed with first primary malignant ovarian tumors treated with definitive surgery and chemotherapy between 2000 and 2016 from 18 population-based registries in the Surveillance, Epidemiology and End Results (SEER) Program. We collected demographic and clinical information on ovarian histologic subtypes, laterality, tumor grade, type of surgery and treatment with radiotherapy. Census tract-level sociodemographic characteristics of women were also described. The incidence of SPGC in our cohort was compared to expected incidence rates in the general population using age- and region-standardized incidence ratios (SIRs) and 95% confidence intervals (CI) for individual racial/ethnic groups. Results: Among 34,081 women with ovarian cancer, 74% were white, 6% were black, 8% were Asian/Pacific Islander (API) and 11% were Hispanic. Median age at diagnosis was lower among API and Hispanic women (54 years) compared to white (60 years) and black women (58 years). Most ovarian tumors were serous or endometrioid, although API women had a higher proportion of clear cell ovarian tumors (15%) compared to white (6%), black (5%) and Hispanic women (6%). Subgroups of API women also differed in distribution of ovarian tumor histology, grade, and age at diagnosis. Whereas incidence of SPGC was observed to be lower than expected among white women (SIR 0.72 CI 0.59-0.87), estimates were suggestive of higher than expected incidence

among black (SIR 1.61, CI 0.88-2.71) and API women (SIR 1.64, CI 0.96-2.63), although confidence intervals included 1.0. Increased risk of vaginal cancers was observed among all women, although risk estimates were highest among API women (SIR 23.90, CI 4.93-69.84) and were also significant for risk of uterine cancers (SIR 2.28 CI 1.21-3.90). Among API women, only Filipinas had significantly increased incidence of SPGC overall including both uterine and vaginal cancers. Conclusions: Risk of SPGC following treatment of ovarian cancer differs by race. The increased incidence of secondary gynecological cancers observed in Asian women is driven largely by increased rates of uterine and vaginal cancers among Filipina women. Further research is warranted to understand the possible mechanism(s) underlying this observed disparity.

C021 Characteristics of malignancy in lesbian, gay, bisexual, and transgender/transsexual (LGBT) population.

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Background: LGBT people account for 4.5% of adult population in U.S. and face multiple challenges across different aspects of life. Although malignancy is the second most common cause of death in the U.S., only few studies that analyzed the characteristics of malignancies in the LGBT community exist. We aim to provide an overview of malignancy affecting LGBT patients. Methods: A retrospective chart review of LGBT patients with a diagnosis of malignancy treated at Medstar Health Hospitals was performed. Natural language processing with strings was utilized to retrieve patient charts with ICD-9 and ICD-10 codes for LGBT status and cancer. Results: A total of sixty-one patients (pts) were identified; (5 lesbian female, 49 gay male, 6 female transgenders and 1 male transgender). The median age was 49 (range: 19-79). 30 pts (49%) were Caucasian, 26 (43%) were African American and 5 (8%) were Hispanic. Among the female transgender patients, 3 received hormonal therapy for gender change and no patient underwent surgery to change the biological gender. 18 pts had human immunodeficiency virus (HIV) infection, 1 pt hepatitis B virus (HBV), 2 pts hepatitis C virus (HCV), 8 pts HIV/HCV, 2 pts HIV/HBV, and 1 pt HIV/HBV/HCV. Among the patients with HIV infection (n=29), 26 (90%) were receiving anti-retroviral treatment at last follow-up. 27 (44%) pts were active smokers, 10 (16%) pts former smokers and 24 (40%) never smoker. 27 (44%) reported a history of substance abuse with 9 (15%) pts with active substance abuse and 25 (41%) never used

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it. Employment status was employed (n=32), unemployed (n=20), retired (n=6), and not available (n=3). Tumor types included anal squamous cell carcinoma (anal SCC; n=15), Non-Hodgkin lymphoma (NHL; n=12), non-small-cell lung cancer (NSCLC; n=9), colorectal cancer (CRC; n=7), Kaposi sarcoma (n=4), brain cancer (n=3), breast carcinoma, small-cell lung cancer and pancreatic cancer (2 each), prostate carcinoma, testicular carcinoma, head and neck cancer, Hodgkin lymphoma and mesothelioma (1 each). Among the HIV-infected patients, tumor types include [NHL n=8, anal SCC n=6, NSCLC n=4, CRC n=4, Kaposi sarcoma n=3, head and neck cancer =1, prostate cancer n=1, pancreatic cancer n=1, Hodgkin lymphoma n=1]. Among the anal SCC group (n=15), 6 pts had human papilloma (HPV)-associated cancer, while 1 pt had non-HPV associated cancer and HPV status was not available in 8 pts. Conclusion: LGBT people with cancer have a high incidence of chronic viral infection and appear to have distinct patterns of malignancy compared to those in the general population. Larger studies are needed to verify the findings and to understand unique challenges facing the LGBT population.

C022 Effect of migration to the US on health characteristics of the African diaspora. [Elizabeth L Blackman](#), Jenisha Stapleton, Brian L Egleston, Camille CR Ragin. Fox Chase Cancer Center, Philadelphia, PA, USA.

Introduction: The current US Black population is heterogeneous, consisting of individuals of US ancestry (direct descendants of enslaved Africans in the US) and individuals of African and Caribbean ancestry (descendants or individuals who have voluntarily migrated to the US post-slavery). Our previous work has shown distinct differences between Black immigrants and US-born Blacks in cancer survival, and cancer fatalism. This study will assess the differences in cancer risk factors, risk behaviors and health-seeking patterns among the African diaspora living in Philadelphia County compared to that of their native countries. Methods: STEPs data Forty-eight countries were defined as Sub-Saharan Africa (SSA) and 29 islands/island groupings were defined as the Caribbean (CA). Sixteen variables of interest were selected including: percentage overweight, percentage who currently smoke tobacco daily, percentage of current drinkers, and average BMI. CAP3 data Recruitment activities took place throughout Philadelphia County beginning in 2012 and is ongoing. Subjects completed a detailed questionnaire assessing behavioral, nutritional, demographics and provided bio-specimens. Results: Data were available for 39 SSA countries and nine CA islands and were included in the analysis for this study. The CAP3 dataset

has a high response rate and most variables of interest included the full study population. Mean BMI reported from the STEPs data was 22.8 (95% CI 19.6-26.1) and 27.1 (95% CI 26.6-27.5) kg/m² for the SSA and the CA, respectively; BMI for African and Caribbean immigrants were 28.6 (95% CI 27.6-29.6) and 28.8 (95% CI 27.5-30.2), respectively, a considerable increase among African immigrants. Alcohol consumption was highest in the Caribbean (54% [95% CI 52.1-55.9] vs 26.5% [95% CI 25.4-27.8]) and Caribbean immigrants in the CAP3 population (23.7% [95% CI 14.7-32.6] vs 16% [95% CI 10.6-21.4]) when compared to SSA and African immigrants, respectively. A noticeable difference was also observed in the proportion of individuals that currently used tobacco. A higher proportion of individuals reported current daily tobacco use in SSA and the CA when compared to immigrants in the CAP3 dataset (SSA: 8.2% [95% CI: 6.2-10.3]; CA 12.2% [95% CI: 10.1-14.2] vs. African immigrant 0%; and Caribbean immigrants 4.6% (95% CI: 2.7-18.0). BMI, alcohol consumption and current daily tobacco use was highest among US-born blacks in the CAP3 dataset (30.6 [95% CI: 29.7-31.5]; 38.6% [95% CI: 33.4-43.3]; and 14.1% [95% CI: 10.7-17.4]. Conclusion: The healthy immigrant affect has been well described in the literature and is apparent in our study population, where immigrants are healthier than native-born individuals. However, we also observed that immigrants were healthier than individuals in their native country, prompting the need for further investigation of this phenomena.

C023 Cervical cancer survival analysis based on screening practices and the socioeconomic position index in Puerto Rico. [Vanessa Gómez-Vargas](#)¹, Israel Almodóvar-Rivera¹, Karen J Ortiz-Ortiz², Carlos R Torres-Cintrón³, Ana P Ortiz-Martínez⁴. ¹Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico, ²Puerto Rico Central Cancer Registry, Cancer Control and Population Sciences Division, University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico, ³Puerto Rico Central Cancer Registry, University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico, ⁴Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, Cancer Control and Population Sciences Division, University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico.

Background: Cervical cancer ranks as the 7th most diagnosed cancer among women in Puerto Rico (PR). When compared to all the states and territories of the United States of America (USA), PR has the highest rate of cervical cancer. Cervical cancer is preventable through screening. While the Healthy People's 2020 goal is a screening rate of 93%, PR falls short at

77%. There is extensive research on how women with screen-detected cancers have better survival than those whose cancer is detected symptomatically. Cancer stage is the primary prognostic factor affecting survival. Yet, stage at diagnosis is a complex interaction among many factors, including social and economic inequities. Evaluating how socioeconomic status and screening behavior affect survival will provide insight into how disparities affect health outcomes. Objective: The purpose of this study is to evaluate the effect of screening behavior and socioeconomic position on the survivorship of cervical cancer patients diagnosed in PR during the period of 2011-2014. Methods: The Puerto Rico Central Cancer Registry (PRCCR) was used to identify all incident cases of primary cervical cancer in women 21 years of age or older, determine the occurrence of the event of interest, and obtain study variables. The database acquired through the PRCCR was linked with health insurance data claims. Through this linkage, cervical cancer screening behavior was documented for at least 3 years before patients' diagnosis. From 937 patients with primary cervical cancer diagnosed during this period, 44% (n=408) were included for this analysis as they had complete information on insurance coverage during the past 3 years (continuous enrollment) and had a microscopically confirmed diagnosis. These patients were followed up to 2017 in order to measure 3-year survival. The Kaplan-Meier Method was used to describe 3-year survival. Also, the Cox Model was used to estimate the risk of death from cervical cancer depending on screening behavior, while controlling for potential confounders. Results: Over half of the patients (52.7%) were insured by Medicaid, 41.2% resided in the area of lowest socioeconomic position (SEP), and only 72.1% were screened 3 years before their diagnosis. Although there weren't any observable differences in survival curves by SEP, 3-year survival was 77% (95% CI 71.3-81.0) among screened patients and 60% (95% CI 50.1-84.6) among unscreened patients. The overall 25th percentile survival time was about 31 months. The 25th percentile survival time was higher for screened patients (42 months) when compared to unscreened patients (14 months). After controlling for age, stage, histology, and tumor stage, screened patients had lower risk of death when compared to unscreened patients (HR= 0.53, 95% CI 0.4-0.8). Conclusions: Screening behavior is an important predictor in cervical cancer survival. Study findings highlight the relevance to continue increasing compliance with screening guidelines in PR in order to positively impact patient survival.

C024 Impact of migration on prostate health factors among West African men in US, Nigeria and Cameroon: Findings from the CaPTC familial cohort study. Folakemi Odedina¹, Getachew Dagne², Adaora Ezeani¹, Ernest Kaninjing³, Catherine Badejo⁴, Anthonia Sowunmi⁴, Omolara Fatiregun⁴,

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INTRODUCTION Prostate Cancer (CaP) disproportionately overburden men of African ancestry, especially Black men (BM). Unfortunately, few CaP studies have focused on the heterogeneity of BM within the US as well as the source population of US BM in Africa. The Prostate Cancer Transatlantic Consortium (CaPTC) team has documented differences in CaP-related behavioral factors, health-seeking behaviors and experiences between US-born and foreign-born Blacks since 2005. The CaPTC familial cohort study was developed to understand the genetic, environmental and behavioral etiology of CaP in West African men (WAm). This presentation focuses on the impact of migration on prostate health factors among WAm. **Methodology** The CaPTC cohort study in a longitudinal study and is still ongoing. The inclusion criteria are WAm, age 35-70 years, and residing in the US, Nigeria and Cameroon. Participants were recruited in diverse community settings. Data were collected from participants who provided informed consent using the CaPTC-AC3 Global Prostate Cancer Measure. The variables included in this presentation are general demographics, cultural beliefs and values, health beliefs, sun exposure, vitamins, body shape, and baldness. In addition, self-reported measures of prostate health were assessed. In addition to descriptive analyses, ANOVA/comparative analyses was used to examine differences among WAm in the US, Nigeria and Cameroon. **Results** The scales employed for the construct were highly reliable (alpha over 0.80). By December 2018, the sample size was 704 WAm with 81% recruited in Nigeria, 10% recruited in Cameroon and 9% recruited in the US. The average age was 48. Most of the WAm live in Nigeria, are married, middle-income level, Christian by faith and had never been screened for CaP. There was statistically significant differences among the WAm based on their country of residence with respect to CaP history (Nigeria), skin color (darker skin color in Cameroon), vitamin use (mostly by WAm in US), and pattern of baldness at age 30 (WAm in Nigeria). In addition, there was statistically significant differences relative to cultural beliefs and values (cancer fatalism, religiosity, temporal orientation) and health beliefs (perceived barrier, perceived benefit).

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Cancer fatalism was lowest among WAm in US; religiosity was highest among WAm in Nigeria; WAm in the US were more future-oriented and WAm in Cameroun more present-oriented; perceived barrier was lowest for WAm in US; and perceived benefit highest for WAm in the US. Conclusion The increasing number of the African immigrant group in the US underscores the need to study within group difference among Blacks in the US. Unfortunately, this group is understudied and may offer a novel approach to fully understand cancer disparities in Blacks. Studying the impact of migration on CaP burden in this population provides several advantages, including identification of CaP risk factors. Our study confirms that migration impacts prostate health factors among WAm.

C025 Lifestyle risk factors for oral and oropharyngeal cancers in patients attending sexually transmitted infection clinics in Puerto Rico. Paola M Rosado¹, Filipa Godoy-Vitorino², Jose A Vivaldi², Ana P Ortiz¹, Jeslie M Ramos-Cartagena¹, Cynthia M Pérez². ¹University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico, USA, ²University of Puerto Rico, Medical Science Campus, San Juan, Puerto Rico, USA.

Introduction: Incidence of oral and oropharyngeal cancers in the United States have increased an average of 0.7% per year over the last decade. Various lifestyles increase the risk of these malignancies, including tobacco, marihuana, and alcohol use, poor oral hygiene, and a diet low in fruits and vegetables. Oral and oropharyngeal cancers are the fourth most common cancer in Puerto Rican men, a group that has shown an excess risk of death from this malignancy compared to other racial and ethnic groups in the United States. This study assessed lifestyle risk factors for oral and oropharyngeal cancers in Hispanic patients attending sexually transmitted infection (STI) clinics in Puerto Rico. Methods: Data from an ongoing cross-sectional study (November 2018-present) among men and women receiving services at STI clinics in the San Juan metropolitan area of Puerto Rico was analyzed. Individuals aged 21-49 years, who are sexually active, and are HIV-negative are eligible for the study. Up to date, 72 patients have been recruited and completed all study procedures. An interviewer-administered questionnaire collects information on sociodemographic and lifestyle characteristics. An oral care index was created using tooth brushing and flossing following the American Dental Association (ADA) recommendations. Results: Over half of participants (52.8%) were men, and the mean age was 32 ± 7.9 years. The majority (70.8%) of participants were single, and more than half reported having public insurance (59.7%), an annual income below \$20,000 (55.6%), and having had less than 10 lifetime sexual

partners (55.7%). Oral and oropharyngeal cancers' risk factors reported by participants included current tobacco use (20.8%), recent (30 days) binge drinking (55.1%), concurrent use of tobacco and alcohol use (16.7%), current marijuana use (43.1%), and vegetable consumption at least once a day (36.1%). Regarding oral health, the majority (81.9%) of the sample did not followed recommendations about oral care by ADA and only 38.0% reported visiting their dentists every six months. Persons with lowest annual household income (<\$20,000) had higher prevalence of smoking (80.0% vs 49.1%), and non-adherence to ADA recommendations (61.0% vs 30.8%) as compared to their counterparts (p<0.05). Conclusion: Given the high prevalence of modifiable risk factors for oral and oropharyngeal cancers in this population, it is crucial to improve risk factor awareness and encourage behavior change. STI clinics represent an important venue for identifying at-risk populations that might benefit from cancer prevention efforts (NIDCR Grant 1R21DE027226-01A1).

C026 Energy-related risk factors and breast cancer subtypes in African American women. Mieke Fortune¹, Steffie-Ann Dujon¹, Mary K Fadden¹, Loren Lipworth², Maureen Sanderson¹. ¹Meharry Medical College, Nashville, TN, USA, ²Vanderbilt University Medical Center, Nashville, TN, USA.

Purpose: To investigate the association between energy-related risk factors and breast cancer subtypes in African American women. We hypothesized that African American women with triple negative breast cancer (TNBC), based on being negative for estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2, would be less likely to have energy-related risk factors than women with other breast cancer subtypes (1) estrogen receptor positive (ER+), and (2) estrogen receptor negative (ER-). Methods: African American women ages 25-75 years diagnosed with primary invasive breast cancer in 2009-2014 in Tennessee, South Carolina, and Georgia were eligible for the study. A total of 697 women (premenopausal n=156; postmenopausal n=541) provided information on energy-related risk factors in a telephone interview and consented to review of tumor tissue. Energy-related risk factors were defined as: no physical activity (54%), high meat intake (upper quartile), obese class II/III (32%), and high weight gain since age 18 (upper quartile). Breast cancer subtype was obtained from pathology reports that accompanied tumor tissue. Results: Although not significantly different, premenopausal (odds ratio (OR) 1.34) and postmenopausal (OR 1.26) women with TNBC were more likely to have high meat intake relative to women with ER+ disease. Premenopausal, but not postmenopausal, women with TNBC were also more likely to have high weight gain

since age 18. Women with ER- disease were more likely to have high meat intake, be obese class II/III, and have high weight gain than women with ER+ disease which was more pronounced among premenopausal than postmenopausal women. Conclusions: Histologic subtyping is currently being performed on collected tissue to confirm the reported breast cancer subtypes in the pathology reports. The large number of African American women participating in our study can further our understanding of the relationships between energy-related risk factors and breast cancer subtypes in this population.

C027 A survey of NCI's extramural microbiome and cancer grant portfolio: Assessing methodologic differences. [Premu Bhattacharjee](#), Gabriel Lai, Rao Divi, Somdat Mahabir. National Cancer Institute, Rockville, MD, USA.

Background. Over the last decade, studies have reported that changes in composition of microbiome may be associated with certain disease states in humans, raising the possibility that managing microbial communities may become important in disease prevention and control. Human microbiome refers to all microorganisms on or in the human body, their genes, and surrounding environmental conditions. Studies on the microbiome suggest that errors at each step in the microbiome analysis pipeline, such as sample collection, transport, storage, DNA extraction/sequencing, bioinformatics, statistical methods, and covariates can contribute to variation in microbiome results. Use of different methods and tools may also impede comparison of microbiome results across studies. It is imperative that we capture microbiome information with high accuracy so that we can understand the microbiome's role in cancer. The National Cancer Institute has funded several studies focused on the human microbiome and cancer. The purpose of our study was to present our assessment of consistency of the methods and technologies used by the cancer epidemiology studies for capturing the microbiome. Methods. We reviewed studies funded between 2013-2018 and extracted information on basic covariates such as demographics and diet; type of biospecimens collected; and the methods used for biospecimen collection, storage, shipping, DNA extraction and sequencing, and bioinformatic tools used for microbiome analysis. We identified 46 relevant funded studies and our assessment found widespread differences in methodologies and technologies used, and in important covariate information collected. Results. For the differences in methodologies and technologies, the results suggest that there is a need for standardization and harmonization of microbiome protocols to minimize variation in results

for improving rigor and reproducibility of the findings. In addition, majority of the studies included predominantly non-Hispanic white participants. There is a need to include diverse groups of participants as it is probable that the microbial composition could vary within other racial/ethnic groups due to differing exposures. Conclusion. Given the link between microbiome and cancer, our findings emphasize the need for improving rigor and reproducibility of microbiome analyses by using standardized methods and racially diverse samples in future research studies.

C028 Oxidative stress-inhibiting nutrients and supplements among West African men: The CaPTC prostate cancer cohort study. Folakemi Odedina¹, Adaora Ezeani¹,

Ernest Kaninjing², Malcom Ingraham¹, Catherine Badejo³, Anthonia Sowunmi⁴, Omolara Fatiregun⁵, Ayo Salako⁶, A.A. Popoola⁷, [Mohammed Faruk](#)⁸, Emeka Iweala⁹, Iya Bassey¹⁰, Chidiebere Ogo¹¹, O.P. Oluwole¹², H.A. Nggada¹³, Jubrin Paul¹⁴, Oluwole Kukoyi¹⁵, Ifeoma Okoye¹⁶, Abidemi Omonisi¹⁷, Iheanyi Okpala¹⁸, Lasebikan Nwamaka¹⁸, Adeniji Adebajji¹⁹, Ruth Agaba²⁰, Toye Adeniji²⁰, [Yaseen Elhag](#)¹. ¹University Of Florida, Orlando, FL, USA, ²Georiga Colleg & State University, Tallahassee, USA, ³FUNAAB, Abeokuta, Nigeria, ⁴LUTH, Lagos, Nigeria, ⁵LASUTH, Lagos, Nigeria, ⁶OAUTHC, Ife, Nigeria, ⁷Univesity of Ilorin, Ilorin, Nigeria, ⁸ABU, Zaria, Nigeria, ⁹Covenant Univesity, Ota, Nigeria, ¹⁰Univeristy of Calabar, Calabar, Nigeria, ¹¹Federal Medical Center, Abeokuta, Nigeria, ¹²University of Abuja Teaching Hospital, Gwagwalada, Nigeria, ¹³University of Maiduguri, Maiduguri, Nigeria, ¹⁴National Hospital, Abuja, Nigeria, ¹⁵Ace Medicare Clinicals Limited, Ota, Nigeria, ¹⁶University of Nigeria Teaching Hospital, Enugu, Nigeria, ¹⁷Ekiti State University Teaching Hospital, Ado Ekiti, Nigeria, ¹⁸College of Medicine, University of Nigeria Nsukka, Enugu, Nsukka, Nigeria, ¹⁹University of Ilorin, Ilorin, Nigeria, ²⁰Prostate Cancer Transatlantic Consortium CaPTC, Nigeria, Nigeria.

Introduction One of the confirmed risk factors for prostate cancer (CaP) is race, with Black men (BM) more likely to get and die from CaP globally. Although CaP affects BM globally, little is known about CaP and its risk factors in foreign-born BM and the source population of US BM in Africa. The Prostate Cancer Transatlantic Consortium (CaPTC) studies CaP in BM globally and has an ongoing familial cohort study of West African men in the US, Nigeria and Cameroon. The CaPTC cohort data provides an opportunity to examine the impact of migration on CaP behavioral risk factors. This study focuses on oxidative stress, which has been linked to CaP. The primary objective was to examine nutrients and supplements that inhibit oxidative stress among West African

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men. **Methods** The CaPTC cohort study is a prospective, longitudinal study of West African men, between ages 35 -70. Participants were recruited from diverse community settings and clinics. Data collection included the use of structured survey for behavioral and epidemiological data, and saliva samples for biological data. For this study, the variables were: known foods with high levels of antioxidants (vitamins); and dietary polyphenols such as berries, beans, leafy vegetables and tea. Descriptive statistics was used to summarize the study results while ANOVA was used to compare study variables among West African men in the US, Nigeria and Cameroon. **Results** A total of 704 West African men (WAm) participated in the study, with 9% recruited in the US, 81% in Nigeria and 10% in Cameroon. Most of the participants were married (93%) and in the middle-income SES. Participants in Cameroon were older with a mean age of 53, followed by those in Nigeria (48) and participants in the US (47). WAm in Nigeria were more likely to have prostatitis compared to the other two groups. There was no differences among the three groups with respect to history of CaP and BPH. The three groups were significantly different statistically for the following food groups: (1) sweet potato, mostly consumed by WAm in Cameroon; (2) beans, mostly consumed by WAm in Nigeria; and (3) berries, mostly consumed by WAm in the US. There was no differences among the groups with respect to leafy greens, grape, tea and Vitamin E. The most popular food reported by the WAm were: beans in Nigeria and berries in the US. In Cameroon, the most popular food tied between beans and sweet potatoes. **Conclusion** Dietary intake of foods rich with antioxidants and polyphenols have been known to be associated with decreased risk of chronic diseases such as CaP. It is interesting to note that the WAm in the different countries consume different types of food groups rich in antioxidants. More research is needed on the antioxidant content of the food as the preparation of the meals may affect content. Also, there needs to be an emphasis on increasing these nutrient rich foods in diets of WAm, given that they are also disproportionately affected by CaP.

C029 Consumption of dietary AGEs during puberty and increased breast cancer risk: A link between lifestyle and cancer disparity. Callan C Frye, Bradley A Krisanits, Reid Schuster, Jaime Randise, Lourdes M Nogueira, Kristi Helke, Amanda C LaRue, David P Turner, Victoria J Findlay. Medical University of South Carolina, Charleston, SC, USA.

Introduction. The focus of this study is on early lifestyle factors and their effect on mammary development during puberty and how they relate to increased breast cancer risk and disparities. At this time we do not understand

what biological changes occur during pubertal mammary development which leads to a greater risk of developing cancer in later life. Identifying the molecular mechanisms that cause aberrant pubertal mammary development may lead to defined strategies to reduce breast cancer burden in later life. As our bodies use the sugars that we consume for energy they generate waste chemicals known as advanced glycation end products or AGEs for short. Significantly, low income, obesity and a sedentary lifestyle are established factors driving health disparity that also contribute to increased AGE accumulation levels in our bodies. In particular, AGE content in the Western Diet has consistently increased over the last 50 years due to increased consumption of sugar-laden and cheap processed/manufactured foods which are high in reactive AGE metabolites and can promote obesity. **Methods.** We use a dietary mouse model to assess impact of AGE on normal mammary development. Wild type FVB/n and RAGE null (RAGE^{-/-}) mice are fed the respective diets from weaning until 7 (pubertal) or 12 (adult) weeks of age. Mammary glands are extracted for whole mounting and paraffin embedded for histology. Fibroblasts were isolated from mammary glands and cultured ex vivo. Transwell migration assays were performed with isolated fibroblasts and HC11 mouse mammary epithelial cells. qPCR was performed on the isolated fibroblasts to assess their activation status. **Results.** Early life exposures during mammary development influence the breast microenvironment to increase breast cancer risk. We show that due to an innate ability to influence the cellular matrix, dietary AGEs disrupt developmental programs during puberty and promote breast tumor growth. Through receptor for AGE (RAGE) dependent and independent mechanisms, chronic AGE consumption delayed ductal extension, increased ductal branching and caused aberrant terminal end bud (TEB) morphology. Dietary AGE activation of RAGE mediated a program of activated stroma leading to hyperplastic growth and the formation of pre-neoplastic lesions which persisted into adulthood. Importantly, AGE mediated effects remained even after diet intervention after puberty. In dietary-AGE breast tumor models, AGE mediated changes in tissue architecture and cell function were recapitulated and resulted in 3-fold increase in neoplastic growth. Through the perpetual activation of a reactive stroma, AGEs derived from diet represent a common early life exposure which can influence tumor behavior. **Conclusions.** A greater mechanistic understanding of the link between AGE intake during puberty and increased breast cancer risk may define novel potential strategies for lifestyle and pharmacological intervention aimed at reducing breast cancer risk and cancer disparities.

C030 Alcohol consumption and risk of young-onset breast cancer among non-Hispanic Black and White women in the Young Women's Health History Study. Kelly A Hirko¹, Darek R Lucas², Dorothy R Pathak¹, Nicole Bohme Carnegie³, Richard T Houang⁴, Kendra Schwartz⁵, Ellen M Velie². ¹Michigan State University College of Human Medicine, East Lansing, MI, USA, ²Joseph J. Zilber School of Public Health, University of Wisconsin, Milwaukee, WI, USA, ³Montana State University, Bozeman, MT, USA, ⁴Michigan State University College of Education, East Lansing, MI, USA, ⁵Wayne State University School of Medicine, Detroit, MI, USA.

The incidence of young-onset breast cancer (YOBC) is increasing, and is higher among Non-Hispanic Black (NHB) than Non-Hispanic White (NHW) women. While alcohol consumption is consistently linked to breast cancer risk, its role in YOBC specifically, is poorly understood. Moreover, it is unclear whether associations of alcohol and YOBC vary by tumor subtype or whether it contributes to disparities by race and/or socioeconomic position (SEP). We examined associations of lifetime alcohol use and YOBC overall and by tumor subtype, and assessed whether associations varied by race, and SEP. We hypothesized that alcohol consumption would be positively associated with YOBC risk, with stronger associations for estrogen receptor (ER)-positive subtypes and similar associations across race and SEP categories. Data are from the Young Women's Health History study, a large population-based case-control study of breast cancer among NHB and NHW women < 50 years of age, from the Los Angeles and Detroit SEER registries. Controls (n=1,381) were identified through area-based sampling and frequency matched to invasive breast cancer cases (n=1,812) by age-group, study site and race. Lifetime average alcohol consumption was collected from in-person interviews, using life history calendars to facilitate accurate recall. Molecular subtypes were defined as: Luminal A (ER-positive and/or progesterone receptor (PR)-positive and human epidermal growth factor 2 (HER2)-negative with grades 1 or 2); luminal B (ER-positive and/or PR-positive and HER2-positive or ER-positive and/or PR-positive and HER2-negative with grade 3); HER2-type (ER-negative and/or PR-negative and HER2-positive); and triple negative (TN; negative for ER, PR, and HER2). Weighted multivariable logistic regression models, adjusted for established risk factors, were used to estimate odds ratios (OR) and 95% confidence intervals (CI) for associations of alcohol consumption and YOBC by subtype. Statistical interaction of alcohol by race and SEP was evaluated using the Wald's test for the cross-product term. Women who consumed >20 g/day of alcohol were slightly leaner, less likely to have a college education and have a family history of breast cancer and more likely to

have smoked than nondrinkers. Alcohol consumption was not significantly associated with YOBC risk overall, or within molecular subtype [LumA (>20 g/day vs. nondrinkers OR (95%CI) = 0.66 (0.43, 1.00), LumB=0.83 (0.53, 1.31), HER2=1.43 (0.63, 3.23), and TN=0.82 (0.52, 1.29)]. We did not observe any interaction by race (p_{int}=0.62) or SEP (p_{int}=0.94) overall or in models of tumor subtypes (all p_{int}>0.28). Alcohol consumption of >20 g/day was inversely associated with LumA among NHW [OR (95%CI) =0.50 (0.28, 0.89)], however, no significant association was observed for LumA in NHB [OR (95%CI) =1.14 (0.61, 2.12)]. Our findings suggest that alcohol consumption is not strongly linked to YOBC risk, and that associations do not appear to vary by molecular subtype, race, or SEP.

C031 Regular physical activity can prevent the oncogenic effects of lifestyle-associated advanced glycation end products. Bradley A Krisanits, Pamela M Woods, Dion Foster, Lourdes M Nogueira, Laura Spruill, Marvella E Ford, Victoria J Findlay, David P Turner. Medical University of South Carolina, Charleston, SC, USA.

Advanced glycation end-products (AGEs), are reactive metabolites produced endogenously as a consequence of glucose metabolism. AGEs accumulate in tissues and organs as we grow older to promote multiple chronic disease phenotypes. AGE pathogenic effects are mediated through modification of protein function, genetic fidelity, stress responses and cellular signaling pathways. Critically, cancer disparity factors such as a sedentary lifestyle, obesity and an unhealthy diet are external influences that have been shown to contribute to the accumulation of AGEs. This research group examined circulating and tumor AGE levels in clinical specimens of prostate cancer and identified a race specific, tumor-dependent pattern of accumulation. AGE levels were highest in aggressive tumors, especially those from men with African ancestry. As our understanding of tumor biology advances, it is becoming increasingly clear that these lifestyle factors have distinct molecular consequences on the biologic make up of tumors, altering cell signaling events and gene expression profiles to contribute to cancer disparity outcomes such as earlier development or its progression to more aggressive disease. Increased AGE levels correlated with an up-regulation in the receptor for advanced glycation end products (RAGE) and activated NFκB. In a syngeneic sub-cutaneous prostate cancer mouse model, chronic consumption of AGE resulted in a 3-fold increase in tumor growth. Dietary-AGE mediated increases in tumor growth were accompanied by a cytoplasmic accumulation of AR, elevation in MYC, RAGE, and AGE as well as increased cell

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proliferation. Given the links between lifestyle and AGEs we examined the effects of regular physical activity on AGE induced tumor growth in our syngeneic sub-cutaneous dietary-AGE prostate cancer model. Mice exposed to physical activity for 1 hour, 5 days per week showed a significant decrease in AGE induced tumor growth. We also examined the effects of dietary-AGEs on tumor progression using the FVB-Tg(C3-1-TAg)cJeg/JegJ (C3-Tag) transgenic spontaneous prostate cancer mouse model. This model progresses to low grade prostate intraepithelial neoplasia (PIN) at 24 weeks. However, chronic consumption of AGE resulted in increased progression towards moderate to high grade PIN at this same time point. When regular physical activity was introduced, we observed delayed progression of PIN in both dietary groups, but most significantly in the high AGE fed mice. These studies support the concept that AGEs represent a biological consequence of the socioeconomic and environmental factors that promote cancer disparity, which may be at least in part reversed via physical activity. This may have the greatest impact for African American patients who tend to have poorer survival, and where a lack of physical activity, poor diet, and high obesity rates are more prevalent.

C032 A hospital farm: Using urban agriculture to address nutrition, physical activity, and food insecurity in cancer survivors. [Hilary Y Ma](#)¹, Avni P Mody², Janelle Lustgarten³, Lisa Ronning³, Rebecca Verm³, Thomas Garcia-Prats⁴, Michelle Seitzinger³. ¹The University of Texas MD Anderson Cancer Center, Houston, TX, USA, ²The University of Texas Health Science Center at Houston, Houston, TX, USA, ³Harris Health System, Houston, TX, USA, ⁴Small Places LLC, Houston, TX, USA.

Purpose: Lyndon B Johnson (LBJ) Hospital, a safety net hospital, serves the racially/ethnically diverse (60% Hispanic) and low-socioeconomic status urban population of Harris County, Texas. A number of chronic disease outcomes including cancer are worse than national statistics, of which a major determinant is modifiable behaviors related to energy balance – nutrition and physical activity. A lack of educational opportunities promoting healthy living and a high prevalence of food insecurity further exacerbate the problem. In response, we are building a farm on the campus of LBJ Hospital. We report the current status and future plan of this long-term project. Methods: The 1.5-acre farm broke ground in April 2018. In the context of cancer, the 2 objectives are: 1) to educate survivors about nutrition and gardening as physical activity, and 2) to reduce cancer incidence by engaging the community through educational activities and satellite gardens. We assembled a task force

consisting of a medical oncologist, a nurse, dieticians, a farmer and population health experts to design a skill-based curriculum. Funding thus far comes from philanthropy and a competitive grant. Results: A full-time farmer was hired in March 2019 to oversee daily operations and to be the liaison with community groups. To date, 34 raised garden boxes have been built, 1/4-acre main plot is expected to yield 250kg of produce/week in fall/winter 2019, 32 fruit trees have been planted, and a nursery is planned. An evidence-based curriculum has been developed: 5 1-hour learning modules integrate nutrition (culinary techniques, culturally-sensitive recipes) with gardening (basic soil biology, seasonality). A 12-month pilot is to begin in fall/winter 2019. Outpatients with hypertension, diabetes or cancer will be eligible for the class. Participant questionnaires will be administered at baseline, completion and after to assess the primary endpoints of knowledge in nutrition (food groups, labeling, etc.), change in consumption of fruits and vegetables (amount, frequency), change in physical activity level (intensity, duration, frequency), and adoption of gardening as physical activity (duration, frequency). Secondary endpoints will be rate of adherence to medical appointments, change in weight, blood pressure control, change in hemoglobin A1c, and quality of life. Food insecurity will be identified using the Hager 2-item screen. We have solidified partnerships with city government officials and community organizations – local high school, churches, county public health department, local food bank and farms. Conclusion: The hospital-based farm is a multi-level intervention targeting energy balance as a root cause of chronic diseases including cancer and food insecurity as a social determinant of health on the patient and community levels. In the upcoming 12-month pilot, we hypothesize the integrated nutrition/gardening classes will increase consumption of fruits and vegetables and uptake of gardening as physical activity.

C033 Dietary advanced glycation end products (dAGEs) and breast cancer by race in the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (PLCO). [Omonefe O Omofuma](#)¹, David P Turner², Lindsay L Peterson³, Anwar T Merchant¹, Jiajia Zhang¹, Susan E Steck¹. ¹University of South Carolina, Columbia, SC, USA, ²Medical University of South Carolina, Charleston, SC, USA, ³Washington University School of Medicine, St. Louis, MO, USA.

INTRODUCTION Advanced glycation end-products (AGEs) are implicated in the pathogenesis of chronic diseases and cancer. AGEs are produced endogenously but can also be consumed in foods. High amounts of AGEs are found in animal products and processed foods, and AGE formation is

accelerated during cooking at high temperatures. Existing disparities in dietary practices could result from limited access to healthy foods among many other factors, further contributing to racial health disparities. The objective of the study was to investigate the association between dAGE intake and breast cancer risk among different racial/ethnic groups of women using the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (PLCO). **METHODS** The PLCO enrolled women aged 55 to 74 years into a randomized controlled trial examining various cancer screening modalities. In this prospective analysis, the study sample included only women enrolled in the intervention arm who were cancer-free at baseline and completed a baseline questionnaire and food frequency questionnaire (DQX) [non-Hispanic White (NHW): 25,096; non-Hispanic Black (NHB): 1,179 and Other race/ethnicity: 1,300]. dAGE values were assigned and quantified to foods in the DQX using a published AGE database. Descriptive analysis was used to obtain means and percentages while Cox proportional hazards model estimated the hazard ratios (HR) and 95% CIs of breast cancer by tertiles of dAGE intake with adjustment for multiple potential confounders. **RESULTS** After a median 11.5 years of follow-up, 1,599 women were diagnosed with breast cancer, including 1,472 NHW, 51 NHB, and 76 Other race/ethnicity. The average dAGE consumption among all the women was 6,106 KU/1000kcal per day (SD: 2691 KU/1000kcal per day) and was highest among NHB (6765 ± 3353 KU/1000kcal per day) compared to NHW (6101 ± 2648 KU/1000kcal per day) and Other race/ethnicity (5604 ± 2723 KU/1000kcal per day). There was an increased risk of breast cancer across the tertiles of dAGE intake (HRT2 VS T1:1.14, 95% CI: 1.00, 1.31 and HRT3 VS T1:1.20, 95% CI: 1.02, 1.42). In stratified analyses, increased risk of breast cancer was observed in all races but was significant only in NHW women (HRT2 VS T1: 1.15, 95% CI: 1.00, 1.32 and HRT3 VS T1: 1.22, 95% CI: 1.02, 1.45). For NHB the association for the highest tertile compared to the lowest tertile was HRT3 VS T1: 1.20, 95% CI: 0.48, 3.01, and for Other race/ethnicity the association was HRT3 VS T1: 1.70, 95% CI: 0.78, 3.73. **CONCLUSION** Among all women in the study, high intake of dAGE increased the risk of breast cancer. Overall the association appeared to be more prominent among NHW women, though small sample sizes resulted in imprecise estimates for other racial/ethnic groups.

C034, PR14 Dietary folate and prostate cancer tumor aggressiveness differences between African Americans and European Americans. Daniela Ramirez Aguilar¹, Susan E Steck², Hui-Yi Lin³, LJ Su⁴. ¹Fay Boozman College of Public Health, University of Arkansas for Medical Sciences, Little Rock, AR, USA, ²Department of Epidemiology and

Biostatistics, The Cancer Prevention and Control Program, University of South Carolina, Columbia, SA, USA, ³Department of Biostatistics, The Louisiana State University Health Sciences Center, New Orleans School of Public Health, New Orleans, LA, USA, ⁴Fay Boozman College of Public Health, Department of Epidemiology, University of Arkansas for Medical Sciences and Winthrop P. Rockefeller Cancer Institute, Little Rock, AR, USA.

Introduction: Folate is a water-soluble B vitamin, which is involved in DNA synthesis and repair, and in regulation of gene expression through DNA methylation as a methyl donor. Despite the confirmed beneficial effect on the prevention of neural tube defect, concerns have been raised on high intakes of folate and its synthetic form, folic acid, may promote carcinogenesis or cancer progression. African American (AA) males tend to have a more aggressive prostate cancer tumor diagnosis compared to European American (EA) males. **Objective:** This aim of this study is to examine the association between folic acid intake in the year prior to PCa diagnosis among AAs and EAs. Using a population-based case-only study, an examination of folic acid was conducted to evaluate the effects of dietary folate on prostate cancer aggressiveness. **Methods:** Data from the North Carolina-Louisiana Prostate Cancer Project (PCaP) questionnaire was used to evaluate 1,497 participants (AA n = 722 and EA n = 775) with a low or high aggressiveness prostate cancer to assess dietary folate intake one year prior to PCa diagnosis using the National Cancer Institute Dietary History Questionnaire. High-aggressive disease was defined as Gleason sum ≥8, or prostate-specific antigen (PSA) >20 ng/mL, or Gleason score ≥7 and clinical stage T3-T4, while low aggressive disease was defined as Gleason sum <7 and stage T1–T2 and PSA <10 ng/mL. All four variables for dietary folate (natural folate, synthetic folate, folate, and dietary folates) were examined. Multivariate logistic regression was used to assess dietary folate and prostate cancer aggressiveness. Confounding variables considered for this analysis include age, BMI, total energy (kcal), education level, and first degree family history of PCa. Additionally, dietary folate was categorized into tertiles. Models were stratified by race and the dose-response relationship was evaluated. **Results:** Folate intakes, regardless natural folate (mean = 354.5 vs 304.1), synthetic folate (176.3 vs 157.5), or total dietary folate equivalent (654.0 vs 571.5), were higher among AA than EA, respectively. Based on the tertile categorization, the highest dietary folate was significantly associated with high aggressive prostate cancer when compared to the lowest intake group among AA and EA combined (odds ratio (OR) = 1.41, 95% confidence interval (CI) = 1.04 – 1.90) after adjusted for confounders. Stratified model by race showed

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that there is an increased trend in PCa aggressiveness and increased folate intake (2nd tertile OR = 1.03, 95%CI = 0.67 - 1.56; 3rd tertile OR = 1.41, CI = 1.11 - 2.48), p-value for trend = 0.01. The association was not observed among EA. The trend is very similar regardless natural or synthetic folate. Conclusion: It appeared that AA with high folic acid intake had a greater chance of being diagnosed with high aggressiveness PCa, while the association was not observed among EA. The finding suggests that the metabolism of folate may be different between AA and EA possibly due to genetic polymorphisms.

C035 Red meat consumption and pancreatic cancer risk in two prospective studies of racially diverse populations.

populations. [Veronica Wendy Setiawan](#)¹, Songren Wang¹, Daniel Stram¹, Lang Wu², Loic Le Marchand², Xiao-ou Shu³, Kristine Monroe¹. ¹University of Southern California, Los Angeles, CA, USA, ²University of Hawaii Cancer Center, Honolulu, HI, USA, ³Vanderbilt University, Nashville, TN, USA.

Backgrounds: There are striking racial/ethnic differences in pancreatic cancer incidence in the United States. Studies have reported positive associations between intake of red meat and pancreatic cancer risk; however, less evidence exists for ethnic/racial minorities, including African Americans who have elevated risks of this fatal cancer. In this study, we assessed the association between red meat consumption and pancreatic cancer incidence in two large cohort studies: the Multiethnic Cohort Study (MEC) and the Southern Community Cohort Study (SCCS). Methods: Demographics, dietary data and other risk factors were assessed at cohort enrollment. Total red meat intake was assessed using a quantitative food frequency questionnaire and categorized using cohort-specific quartiles. Incident cases of pancreatic cancer were identified via linkage to state cancer registries and the National Death Index. Cox proportional hazards regression was used to calculate hazard ratios (HR) and 95% confidence intervals (CIs) for the association of red meat intake with pancreatic cancer risk in each cohort. Cox models were stratified by race/ethnicity and adjusted for age, sex, body mass index, smoking status, pack-years of smoking, history of diabetes mellitus, familial pancreatic cancer, and energy intake. Results: A total of 184,542 (MEC) and 66,793 (SCCS) at risk participants were included in this analysis. The median intake of red meat varied across racial/ethnic groups in both cohorts. In MEC, red meat intake was highest in Native Hawaiians and lowest in whites. In SCCS, red meat intake was higher in whites compared to African Americans. Overall, red meat intake in the SCCS was about twice the intake in the MEC. During follow up (average 17.5 years in MEC and 10.6 years in SCCS), we identified 1,618

MEC (297 African Americans, 564 Japanese Americans, 294 Latinos, 139 Native Hawaiians, 324 whites) and 266 SCCS (195 African Americans, 71 whites) incident pancreatic cancer cases. In all ethnic groups combined, consumption of red meat was associated with increased pancreatic cancer risk in the MEC (HR Q4 vs. Q1 = 1.18; 95% CI: 1.02-1.37, P trend=0.08) and the SCCS (HR Q4 vs. Q1 = 1.30; 95% CI: 0.91-1.84, P trend = 0.08). In both cohorts, similar associations were observed in men and women (P heterogeneity \geq 0.76). While the association with red meat did not differ significantly across five ethnic groups in the MEC (P heterogeneity=0.42), the association was statistically significant only in African Americans (HR=1.49; 95% CI: 1.05-2.10, P trend=0.011) and Latinos (HR=1.44; 95% CI: 1.02-2.04 P trend=0.07), but not in Japanese Americans, Native Hawaiians or whites. Similarly, in the SCCS the association with red meat was only observed in African Americans (HR=1.54; 95% CI: 1.02-2.31; P trend=0.019), and not in whites. Conclusion: Our results show that red meat intake was positively associated with pancreatic cancer risk in these two cohort studies, with the strongest association observed in African Americans and Latinos.

C036 Disparities in dietary behavior in East Harlem, New York City.

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Cancer is the second most common cause of deaths in the United States, disproportionately affecting minority groups. A diet low in fruits and vegetables is associated with increased risk of cancer. In this multidisciplinary study, we assessed the dietary behaviors and the urinary concentrations of gallic acid, an antioxidant found in various fruits and vegetables, of minorities in New York City. Seventy-five (75) participants were recruited from a senior center in East Harlem, New York City, a racially diverse and underserved community. A National Institute of Health (NIH) - validated survey questionnaire was used to collect dietary behavior data. Demographic and cancer history information were also collected. All 75 participants completed the survey and forty-one (41) participants provided urine samples for urinary gallic acid content analysis. Associations between demographic factors and the intake of certain foods were observed. Specifically, age was negatively associated with the frequency of French fries/fried potatoes and white potatoes

intake ($p < 0.05$), while positively associated with frequency of fruit intake ($p < 0.05$). Additionally, Asian race was associated with a higher frequency of fruit intake ($p < 0.05$), compared to other races. Moreover, two male participants (1 Black/African American and 1 White) reported incidences of cancer. Although both individuals reported a college education or higher, they related an annual household income of less than \$50,000. In addition, their intake of fruits and vegetables was lower (2.93 ± 1.35) compared to the overall sample (3.38 ± 5.07), along with a much lower detected urinary gallic acid mean concentration (1.78 ± 0.77) compared to the total urinary gallic acid concentration sample mean (11.11 ± 23.14). This study provides preliminary information about the dietary behavior of older adults in East Harlem, which will serve as a basis for a future larger study to investigate the effect of nutrition/dietary education intervention on cancer prevention among diverse groups in New York City.

C037 Development of a physical activity intervention using the socioecological model framework: Formative evaluation among rural African American women. [Marla B. Hall](#), Ari K. Mwachofi, Caroline B. Collier, Kiana L. Kerwin. East Carolina University, Greenville, NC, USA.

Due to physical activity (PA) engagement disparities among African Americans (AA), individuals of this population are at increased prevalence for various chronic diseases. Moreover, research suggests that higher levels of PA are linked to lower risk of several cancers. However, within rural areas, locality challenges related to the built environment have been noted as a deterrent for engagement. The purpose of the study was to gather recommendations, using formative evaluation, to develop a physical activity (PA) program for older African American (AA) women (≥ 50 years of age) residing in eastern North Carolina. Focus group (FG) participants were recruited in partnership with local lay health advisors and other trusted community members. Utilizing the socioecological model as a framework, qualitative data were stratified and analyzed using SPSS and NVivo. Participants included a total of 46 women from a convenience sample which consisted of three FGs. At the intrapersonal level, respondents expressed interest in increasing their PA engagement through methods such as walking and/or dancing, and the incorporation of self-monitoring tools to track progress. Regarding interpersonal level suggestions, participants noted the inclusion of group-based approaches. In addition, community level guidance highlighted the scarcity of PA facilities for those residing outside of the county seat, and the necessity of partnering with pre-existing buildings. Lastly, policy level direction was related to environmental infrastructure (i.e.,

lack of street lights and sidewalks) and personal safety as attributes for inactivity. To circumvent this issue, respondents suggested that outdoor PA sources have consistent law enforcement presence. Data obtained will be used to guide the development of a culturally-tailored and community-advised multilevel PA intervention for older AA women of rural residence.

C038 First- and second-degree family history of ovarian and breast cancers in relation to risk of invasive ovarian cancer in African American and White women. [Traci N. Bethea](#)¹, Heather M. Ochs-Balcom², Elisa V. Bandera³, Alicia Beeghly-Fadiel⁴, Fabian Camancho⁵, Emily K. Cloyd⁵, Holly R. Harris⁶, Charlotte E. Joslin⁷, Evan Myers⁸, Patricia G. Moorman⁹, Lauren C. Peres¹⁰, Veronica W. Setiawan¹¹, Anna H. Wu¹¹, Lynn Rosenberg¹², Joellen M. Schildkraut⁵.

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Background: Family history of ovarian and breast cancers is a well-established risk factor for ovarian cancer and recent findings suggest that the risk of ovarian cancer may be higher for African American (AA) women compared to other racial/ethnic groups. Few studies have been able to examine

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this association in both AA and White participants taking into account histotype. Methods: The Ovarian Cancer in Women of African Ancestry Consortium harmonized data from four case-control studies and two case-control studies nested within cohort studies. Each study collected self-reported first-degree family history of ovarian and breast cancers; the four case-control studies also collected self-reported data on second-degree family history of ovarian and breast cancers. For cases, data on age at diagnosis, tumor grade, and tumor histology were abstracted from medical records and cancer registry reports. Race-specific odds ratios (ORs) and 95% confidence intervals (CIs) were estimated using multilevel logistic regression with control for covariates. Results: Our sample included 1,052 AA cases, 2,328 AA controls, 2,380 White cases, and 3,982 White controls. The prevalence of first-degree history of ovarian or breast cancer was higher among AA than White ovarian cancer cases (28% vs. 21%) and similar among AA and White controls (15% vs. 16%). The prevalence of second-degree family history of ovarian or breast cancer was similar among AA and White ovarian cancer cases (38% vs. 34%) and among AA and White controls (28% vs. 32%). First-degree family history of ovarian cancer was significantly associated with high-grade serous ovarian cancer in both AA (OR=2.33; 95% CI: 1.48, 3.69) and White participants (OR=2.86; 95% CI: 2.03, 4.02). In AA women, first-degree family history of breast cancer was associated with increased risk of high-grade serous ovarian cancer (OR=1.80; 95% CI: 1.38, 2.34) and all other histotypes combined (OR=1.62; 95% CI: 1.16, 2.25). In White women, first degree family history of breast cancer was associated with high-grade serous ovarian cancer only (OR=1.40; 95% CI: 1.16, 1.68). Second-degree family history of ovarian cancer was associated with high-grade serous ovarian cancer among White women (OR=1.95; 95% CI: 1.32, 2.90) and second-degree family history of breast cancer was associated with high-grade serous ovarian cancer in AA women (OR=1.48; 95% CI: 1.11, 1.98). Second-degree family history of ovarian or breast cancer was not associated with the other histotypes. Estimates across studies were compatible with overall estimates (heterogeneity>0.05). Conclusion: First-degree family history of ovarian cancer may be more strongly associated with high-grade serous ovarian cancer than other histotypes in AA and White women. Second-degree family history of cancer may differ by race in the associations with ovarian cancer, but potential underreporting of second-degree family history and inability to account for family size limit interpretation of these data.

C039 Investigation of a prostate cancer genetic susceptibility candidate region on chromosome 5 in African Americans. Albert M Levin¹, Gregory Dyson², Julie L Boerner², Julie J Ruterbusch², Cathryn H Bock². ¹Henry Ford Health System, Detroit, MI, USA, ²Karmanos Cancer Institute at Wayne State University School of Medicine, Detroit, MI, USA.

There are well documented, marked racial disparities in prostate cancer (PCa) incidence and mortality in the United States between African American (AA) and European American (EA) men. These disparities cannot be fully explained by differences in screening or treatment differences by race, and other environmental and biological risk factors have not been well characterized. We hypothesize that racial differences in the distribution of genetic risk factors may contribute to the observed disparities. We previously identified a region on chromosome 5q35 via admixture mapping that is associated with PCa in AA men (Bock 2009). Preliminary analyses in this region suggested two loci involved in chromatin regulation, and several genes including COL23A1, TSPAN17, and GRM6. These are genes that have not been well characterized in the literature, however hints of their role in PCa can be found within previous expression studies. Here, we examine the region on chromosome 5q35 in greater depth to first confirm the observed admixture and to leverage the admixture signal within that region to identify novel variants associated with risk of prostate cancer in African Americans. To achieve the first goal, we estimated genome-wide and local ancestry across chromosome 5 in African American subjects from the Multiethnic Cohort (MEC) and an independent case control study from the Barbara Ann Karmanos Cancer Institute (KCI). Our results validated the significance of the admixture ($p=7.87 \times 10^{-6}$). However, the ancestry odds ratio from the MEC study was in the opposite direction in comparison to our original discovery analysis. Despite this difference, after combining studies via meta-analysis, we still retained a significant admixture peak on the distal portion of the chromosome 5q ($p=5.47 \times 10^{-4}$), which stretched from 152-180Mb. Overall, this effect showed that increasing European ancestry at this locus was associated with increased risk of prostate cancer. Additionally, our admixture meta-analysis uncovered a secondary peak ($p=3.66 \times 10^{-4}$) from 64-96Mb, where increased risk of prostate cancer was again associated with increasing European ancestry at this locus. We also performed association testing using the MIXSCORE approach, which is a combined test of genotype and local ancestry association. Our most significant association results were located within our primary admixture association peak, and they clustered around a locus at 173 Mb. The lead single nucleotide polymorphism (SNP) within this region

was rs6885032 (MIXSCORE $p=7.83 \times 10^{-4}$). Interestingly, this SNP was identified in a genome-wide association analysis as associated with height, and a recent meta-analysis of studies from the literature confirmed an association between height and prostate cancer risk. Furthermore, this SNP was also identified as an expression quantitative trait locus ($p=3.30 \times 10^{-9}$) in the Genotype-Tissue Expression project. This convergence of findings suggests a possible mechanism for this variant on prostate cancer risk.

C040, PR05 A meta-analysis of genome-wide association study and eQTL analysis of multiple myeloma among

African Americans. Zhaohui Du¹, Niels Weinhold², Gregory Chi Song², Kristen A Rand³, David J Van Den Berg¹, Amie E Hwang¹, Xin Sheng¹, Victor Hom¹, Sikander Ailawadhi⁴, Ajay K Nooka⁵, Seema Singhal⁶, Karen Pawlish⁷, Edward Peters⁸, Cathryn Bock⁹, Ann Mohrbacher¹⁰, Alexander Stram¹¹, Sonja I Berndt¹², William J Blot¹³, Graham Casey¹⁴, Victoria L Stevens¹⁵, Rick Kittles¹⁶, Phyllis J Goodman¹⁷, W. Ryan Diver¹⁴, Anselm Hennis¹⁸, Barbara Nemesure¹⁸, Eric A. Klein¹⁹, Benjamin A. Rybicki²⁰, Janet L. Stanford¹⁶, John S. Witte²¹, Lisa Signorello¹², Esther M. John²², Leslie Bernstein¹⁶, Antoinette Stroup²³, Owen W. Stephens², Maurizio Zangari², Frits Van Rhee², Andrew Olshan²⁴, Wei Zheng¹³, Jennifer J. Hu²⁵, Regina Ziegler¹², Sarah J. Nyante²⁴, Sue Ann Ingles¹, Michael Press²⁶, John David Carpten²⁷, Stephen Chanock¹², Jayesh Mehta⁶, Graham A Colditz²⁸, Jeffrey Wolf²¹, Thomas G. Martin²¹, Michael Tomasson²⁹, Mark A. Fiala²⁸, Howard Terebelo³⁰, Nalini Janakiraman³¹, Laurence Kolonel³², Kenneth C. Anderson³³, Loic Le Marchand³², Daniel Auclair³⁴, Brian C.-H. Chiu³⁵, Elad Ziv²¹, Daniel Stram³⁶, Ravi Vij²⁸, Leon Bernal-Mizrachi³⁷, Gareth J. Morgan³⁸, Jeffrey A. Zonder⁹, Carol Ann Huff³⁹, Sagar Lonial⁵, Robert Z. Orlowski⁴⁰, David V. Conti^{1*}, Christopher A. Haiman¹, Wendy Cozen^{1,26}. ¹Center for Genetic Epidemiology, Department of Preventive Medicine, Keck School of Medicine of USC, University of Southern California, Los Angeles, CA, USA, ²Myeloma Center, University of Arkansas For Medical Sciences, Little Rock, AR, USA, ³Millennium Pharmaceuticals Inc., Takeda Pharmaceutical Company Limited, Cambridge, MA, USA, ⁴Division of Hematology-Oncology, Mayo Clinic, Jacksonville, FL, USA, ⁵Winship Cancer Institute/ Hematology and Medical Oncology, Emory University, Atlanta, GA, USA, ⁶Feinberg School of Medicine, Northwestern University, Chicago, IL, USA, ⁷New Jersey Department of Health, Trenton, NJ, USA, ⁸Louisiana State University School of Public Health, New Orleans, LA, USA, ⁹Karmanos Cancer Center, Wayne State University, Detroit, MI, USA, ¹⁰Department of Medicine, Division of Hematology, University of Southern California, Los Angeles, CA, USA, ¹¹Genomic Health, Inc., Redwood City, CA, USA, ¹²National Cancer Institute, Division of Cancer

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Background: Persons of African ancestry (AA) experience a 1.5-2-fold risk of multiple myeloma (MM) compared to persons of European ancestry (EA). We assembled a set of MM patients with self-reported AA in order to evaluate the contribution of genetics to etiology in this high-risk group. Methods: Here we present the results of a meta-analysis of two GWAS in 1,813 cases and 8,871 controls of AA. We also conducted an admixture mapping scan to identify risk alleles associated with local ancestry, fine-mapped the 23 known susceptibility loci to find markers that could better capture MM risk in individuals of AA and constructed a polygenic risk score (PRS) to assess the aggregated effect of known MM risk alleles. Finally, we conducted an eQTL analysis measuring gene expression in those genes harboring a risk variant in malignant plasma cells from 292 of the patients from a single site. Results: In GWAS analysis, we identified two suggestive novel loci located at 9p24.3 and 9p13.1 at $P < 1 \times 10^{-6}$; but no genome-wide significant association was noted. In admixture

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mapping, we observed a genome-wide significant inverse association between local AA at 2p24.1-23.1 and MM risk in AA individuals. 20 of the 23 known EA risk variants showed directional consistency and 9 replicated at $P < 0.05$ in AA individuals. In eight regions, we identified markers that better capture MM risk in persons of AA. AA individuals with a PRS in the top 10% had a 1.82-fold (95%CI: 1.56, 2.11) increased MM risk compared to those with average risk (25-75%). The strongest functional association was between the risk allele for variant rs56219066 at 5q15 and lower ELL2 expression ($P = 5.1 \times 10^{-12}$). Conclusions: Our study shows that common genetic variation contributes to MM risk individuals of AA

C041 Complexities of hereditary breast cancer: Investigating a large African American family. [Sophonie Omeler-Fenaud](#), Madison Bishop, Elizabeth Stallworth, Isaac McNeely, Nancy Merner. Auburn University, Auburn, Alabama, USA.

Breast cancer (BC) is a very serious health concern being the second most commonly diagnosed cancer among American women. Although the overall incidence rate of BC in African American (AA) and European American women converged in 2012, AA women are reported to have a higher mortality rate at every age, and a higher incidence rate under the age of 45, which is a hallmark of hereditary BC. Characteristics of hereditary BC include a family history of the disease, early ages of onset, bilateral BC, male BC, as well as the occurrence of other associated cancers such as ovarian and prostate. Cancer incidences in these families are influenced by inherited risk factors; currently, mutations in known susceptibility genes, including *BRCA1/2*, explain ~20-30% of hereditary cases, leaving up to ~70% genetically unsolved. Despite the universal need to decipher the currently unexplained cases, it is important to note that these statistics are mainly the result of studying individuals of European descent. The mutational landscape that explains AA hereditary BC is more obscure since, comparatively, it has been vastly understudied. Recognizing this knowledge gap, our group is committed to adding to the current limited resources necessary to better understand AA BC genetics. We are doing this through a strategic community-based recruitment protocol to enroll underrepresented individuals in Alabama, adding to the Alabama Hereditary Cancer Cohort. With over 150 AAs enrolled to date, we have ascertained some impressive AA BC families. Of those families, Family 1CAD is one of the largest with over 15 family members enrolled. Their participation was fostered through an invitation to their family reunion. There, it was disclosed that a deceased family member had a pathogenic *BRCA1* mutation

(p.M1796R). Therefore, all participating family members were first screened for the *BRCA1* mutation through polymerase chain reactions and Sanger sequencing; interestingly, not all cancer-affected individuals screened positive for this mutation. Therefore, five cancer-affected individuals (three mutation-positive and two mutation-negative) were selected and screened using an exploratory research-based gene panel that targets genes that have been suggested, predicted, or clinically proven to be associated with BC and associated cancers. Firstly, this screening confirmed each individual's mutation status. It also provided additional insight; for example, all three cancer-affected individuals who have *BRCA1* M1796R also share a truncation variant in a candidate gene on the panel, which plays an important role in cell cycle regulation (*GeneX*). A preliminary analysis using AA BC cases from The Cancer Genome Atlas and ethnic-specific controls from the Exome Variant Server, suggests that truncation variants in *GeneX* are associated with AA BC risk. We are in the process of validating these findings and determining how this truncation variant modifies risk in *BRCA1* mutation carriers.

C042 Family history of cancer among African Americans with breast, prostate, lung, and colorectal cancers in the Detroit Research on Cancer Survivors cohort. Kristen S Purrington, [Julie J Ruterbusch](#), Mark Manning, Michael S Simon, Jennifer Beebe-Dimmer, Ann G Schwartz. Wayne State University, Detroit, MI, USA.

Individuals with familial cancers are at increased risk of second primary cancers, and there are clear clinical guidelines for treatment and follow-up. However, the literature on the patterns of cancer family history (FH) in African Americans (AAs) is sparse. Detroit Research on Cancer Survivors (ROCS) is a population-based cohort study of AAs residing in metropolitan Detroit diagnosed with a primary invasive cancer of the breast, colon/rectum, lung or prostate after January 1, 2013. ROCS participants complete baseline and yearly follow-up questionnaires that include assessment of participants' family history of cancer. We examined the distribution of breast, prostate, colorectal, lung, kidney, liver, ovarian, pancreatic cancers among first degree relatives and grandparents of Detroit ROCS participants (i.e. probands). We also estimated the distribution of cancers involved in known hereditary cancer syndromes (hereditary breast and ovarian cancer (HBOC), Lynch, Peutz-Jeghers, Cowden, Li-Fraumeni) within these families. Associations between probands' age of onset and cancer family history were evaluated using logistic regression. Among the first 1,500 ROCS participants recruited into the cohort (674 breast,

138 colorectal, 174 lung, 514 prostate), 71% reported at least one relative with a cancer of any type, which did not vary substantially by proband cancer site. FH of breast ($p < 0.001$), colorectal ($p = 0.010$), lung ($p = 0.022$), prostate ($p < 0.001$), and ovarian ($p = 0.044$) cancers significantly varied by proband cancer site, where probands were most likely to report a FH of their index cancer site (breast: 30%, colorectal: 17%, lung: 25%, prostate: 28%). When restricted to older family members (parents + grandparents), a FH of cancer matching the probands' cancer site increased the odds of being diagnosed under the age of 50 (Breast: Odds ratio (OR)=1.73, 95% confidence interval (CI) 1.01-2.96; colorectal: OR=3.71, 95% CI 0.71-19.41; prostate: OR=1.86, 95% CI 0.91-3.79). FH of HBOC cancers was most common among probands with breast (47%) and prostate (43%) cancer compared to other sites (28-34%, $p < 0.001$), while FH of Li-Fraumeni cancers was most common among probands with breast cancers (31% vs. 17-22%, $p < 0.001$). Probands with breast and colorectal cancers were more likely to report FH of Cowden cancers (36-38% vs. 24-25%, $p < 0.001$). FH of Lynch and Peutz-Jeghers cancers were less commonly reported among probands with lung (23% vs. 32-38%, $p = 0.004$) and prostate (39% vs. 48-53%, $p < 0.001$) cancers, respectively. AAs with breast, prostate, lung, and colorectal cancers frequently report FH of cancer, and patterns of FH differ by index cancer site. A better understanding of cancer family history among AAs could provide insights into cancer etiology in this population.

C043 Ethnic disparities among pancreatic cancer patients undergoing germline testing. [Ana I Velazquez](#)¹, Carolina Bernabe Ramirez², Daniel H Kwon¹, Ryan Leibrand³, Narjust Duma⁴. ¹University of California, San Francisco, San Francisco, CA, USA, ²Zucker School of Medicine at Hofstra/Northwell, Lake Success, NY, USA, ³Icahn School of Medicine at Mount Sinai Beth Israel, New York, NY, USA, ⁴University of Wisconsin Carbone Cancer Center, Madison, WI, USA.

Background: New NCCN guidelines recommend germline testing for all patients with confirmed pancreatic cancer (PC) regardless of stage, family history, or ethnicity. PC is linked to inherited cancer susceptibility syndromes, with approximately 10% of cases occurring in the presence of family history. Per SEER statistics, African-Americans (AA) have the highest incidence rate (67% higher) of PC of all ethnic groups and the worse prognosis. Current data links this risk to social and access issues rather than biology. We aim to determine whether the prevalence of germline mutations associated with increased PC susceptibility varies by ethnicity. Methods: We retrospectively examined publicly-

available, de-identified, germline and clinical data of patients with a diagnosis of pancreatic cancer (PC) referred to Color Genomics by a healthcare provider for testing of 30 genes associated with hereditary cancer risk. Clinical data included age at diagnosis, sex, self-reported ethnicity, family history of cancer, and personal history of cancer. Ashkenazi Jewish (AJ) ancestry was classified as an ethnic group. Germline genetic variants were classified as pathogenic (P), likely pathogenic (LP), variant of uncertain significance (VUS), likely benign, or benign. Prevalence of P/LP and VUS variants was compared among subgroups classified by age at diagnosis (≤ 65 or > 65 years-old), sex, self-reported ethnicity, family history of PC, and personal history of other cancer using chi-square tests. Results: We identified 167 patients with PC of any stage who underwent germline testing. Among these, 47.9% were female and 52.1% male. Ethnic composition was 73.1% Caucasian, 8.4% AJ, 3.6% Hispanic, 3.6% AA, 4.2% Asian, and 7.2% of other or unknown ethnicity. Twenty-four (14.4%) patients carried a P/LP variant, and 45 (26.9%) patients carried a VUS. The most prevalent P/LP variants were BRCA2 (29.6%), ATM (22.2%), and MUTYH (14.8%). APC (18.4%), BRCA2 (14.3%), and ATM (12.2%) were the most prevalent VUS variants. AJ patients had an increased prevalence of P/LP BRCA2 variants (83%, $n = 5$). Ethnicity was significantly associated with risk of carrying any P/LP variant ($p = 0.049$) but not with a VUS; this association was lost when excluding those of AJ ancestry. Age, sex, family history of PC, and personal history of a second cancer were not associated with risk of carrying any P/LP or VUS variants. Conclusions: Germline mutations are prevalent among PC patients and highest among those of AJ ancestry. Although the prevalence of germline variants is not associated with other ethnic groups, our study highlights the underrepresentation of minorities in germline testing databases, particularly AA. The prevalence of germline variants in minority ethnic groups with PC remains an understudied area and is an example of how barriers to access can limit our understanding of diseases. Further studies are needed to address this critical unmet need.

C044 Inter-ethnic differential gene expression in stage II recurrent colorectal cancers. [Prachi Bajpai](#)¹, Amr Elholy¹, Michael Behring¹, Dongquan Chen¹, Kevin Hale¹, Sumit Agrawal¹, Hyung-Gyoon Kim¹, Trafina Jadhav¹, Temegsen Samuel², Upender Manne¹. ¹University of Alabama at Birmingham, Birmingham, Alabama, United States, ²College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama, United States.

Inter-ethnic differential gene expression in stage II recurrent

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colorectal cancers Prachi Bajpai¹, Amr Elholy¹, Michael Behring¹, Dongquan Chen^{2, 3}, Kevin Hale¹, Sumit Agrawal¹, Hyung-Gyoon Kim¹, Trafina Jadhav¹, Temegsen Samuel⁴, Upender Manne^{1, 3} ¹Department of Pathology, ²Division of Preventive Medicine, Department of Medicine, University of Alabama at Birmingham (UAB), Birmingham, Alabama, USA, ³O'Neal Comprehensive Cancer Center of UAB, Birmingham; ⁴Department of Pathobiology, College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama, USA

Background and Objective: For colorectal cancer (CRC), the second most common cause of cancer-related death in the US, there are racial/ethnic disparities in incidence and mortality. Of these patients, 25-35% with pathologic Stage II CRCs exhibit recurrence after surgery with curative intent. Relative to Caucasian (CA) patients, African American (AA) patients with CRC have a 20% higher stage-specific mortality. The present study delineates a distinct gene expression profile, specific for Stage II CRCs, based on disease recurrence and patient race/ethnicity. **Methods:** We obtained gene expression profiles for Stage II CRCs from 16 AA and 30 CA patients by the use of Affymetrix GeneChip microarrays. Samples from patients with recurrent disease, within 5 years post-surgery, were compared to those with non-recurrent CRCs within 5 years post-surgery. For comparison between AA with CA patients, gene expression was assessed. **Results:** For recurrent CRCs, there were nine genes common to AA and CA patients, suggesting a common gene signature specific for Stage II disease. For tumors, relative to their corresponding normal tissues, there was higher expression of five of these genes; the direction of association with disease recurrence was distinct with race/ethnicity. GFM2, DCAF17, and GEN1 had a positive association with recurrence in CAs and a negative association with recurrence in AAs. Additionally, for recurrent patients, TAPBP and FEZ were upregulated in AAs and downregulated in CAs (False Discovery Rate <0.05 for all genes). BCL2L2, OXA1L, AHNAK2, and MEGF6 were consistently overexpressed in CRCs of both race/ethnicity groups. Currently, we are validating these findings in a prospective Stage II CRC cohort to correlate observations with time to recurrence. **Conclusion:** The present study identifies molecular signatures, specific for Stage II CRCs, for patients of two ethnic backgrounds, and contribute to a better understanding of the CRC health disparities for AAs and CA. This work was supported by a NIH/NCI grant (U54CA118948).

C045 Outcomes of hormone-receptor positive, HER2-negative breast cancers by race and tumor biologic features.

H. Shelton Earp¹, Andrew F Olshan¹, Lisa A Carey¹, Charles M Perou¹, Melissa A Troester¹, Halei C. Benefield¹, Katherine

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Background: Black women have higher breast cancer mortality than white women, particularly within the hormone receptor positive, human epidermal growth factor receptor 2 negative (HR+/HER2-) clinical subtype. Interactions between tumor biology and treatment factors are complex and racial disparities in early events (such as 5-year recurrence risk) are not well characterized. **Methods:** Using data from the Carolina Breast Cancer Study (Phase 3, 2008-2013), a large population-based study enrolling 50% black and 50% white women from 44 counties in North Carolina, we estimated associations between race and recurrence among non-metastatic HR+/HER2- tumors, overall and within subgroups defined by PAM50 Risk of Recurrence score (ROR-PT, calculated from subtype, proliferation level, and tumor size), PAM50 intrinsic subtype, and tumor grade. We also compared treatment patterns by race among HR+/HER2- patients with high-risk disease. Relative frequency differences (RFD), interpretable as the percentage difference between index and referent groups, were estimated using multivariable linear regression. Recurrence risk was estimated using survival curves standardized for age and stage and inverse probability-weighted Cox models. **Results:** Among 1,775 eligible women, black women had higher recurrence risk relative to white women (crude hazard ratio: 1.8, 95% confidence interval [CI]: 1.3, 2.5), which remained elevated after standardizing for age and clinical covariates (hazard ratio: 1.4, CI: 1.0, 1.9). In stratified analyses, racial disparities persisted among women with high ROR-PT score (5-year standardized recurrence risk 18.9% in black vs. 12.5% in white women) and in high grade patients (5-year standardized recurrence risk 16.6% in black vs. 12.0% in white women). Black women with high grade tumors were significantly less likely to initiate endocrine therapy (RFD: -8.4%, CI: -15.9, -1.0) and experienced treatment delay more often than white women (RFD: +10.4%, CI: 1.8, 19.0). **Conclusions:** Racial disparities in HR+/HER2- breast cancer recurrence persist within high-risk subgroups. Efforts to identify treatment inequities and other causes of variation in cancer treatment are critical to reducing outcome disparities.

C046 Racial and ethnic differences in the association of body mass index (BMI) and melatonin levels among men in the Multiethnic Cohort Study. Ilkania M Chowdhury-Paulino¹, Iona Cheng², Unnur A Valdimarsdottir³, Loic Le Marchand⁴,

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Purpose Obesity and circadian rhythm disruption are risk factors for various cancers, including advanced prostate cancer. Given the differences in obesity rates by racial groups, the emerging evidence suggesting racial differences in circadian function, and the well-known racial disparities in cancer incidence and mortality, we aimed to explore the association between obesity and melatonin levels within a diverse population and assess how this association differed by racial/ethnic group. **Methods** This study leveraged 2,786 male controls from a nested case-control study within the Multiethnic Cohort Study. Melatonin was measured by its primary metabolite, 6-sulfatoxymelatonin, in first-morning void and overnight urine samples collected between 2001 and 2006 prior to cancer diagnosis. We categorized men based on body mass index (BMI) as underweight: <18.5 kg/m²; normal: 18.5 kg/m² to <25 kg/m²; overweight: 25 kg/m² to <30 kg/m²; and obese: 30 kg/m². We used linear regression models to evaluate the association between obesity and melatonin levels, adjusted for urinary creatinine levels, age, race/ethnicity, occupation, years of schooling, month of urine collection, sleep duration, physical activity, smoking, and alcohol use. We further examined associations between obesity and melatonin within racial/ethnic groups. **Results** The prevalence of obesity differed by race/ethnicity, with 34.3% of Native Hawaiian (NH), 25.0% of African American (AA), 22.1% of Latino, 14.8% of White, and 10.6% of Japanese men categorized as obese (chisq p-value < 0.001). Latino and White men had the highest levels of melatonin with a median of 25.1 ng melatonin/mg creatinine; the median levels in Japanese (23.4 ng/mg), AA (23.0 ng/mg), and NH men (22.3 ng/mg) were lower (Kruskal-Wallis p-value=0.03). These differences remained after adjusting for BMI, with AAs having the lowest and Latinos the highest melatonin levels. In multivariable models, men who were obese had melatonin levels that were 16.9% (95% CI: 9.8%, 23.5%) lower than normal weight (NW) men. When stratified by race/ethnicity, we found that obese white men had 16.5% (95%

CI: 3.0%, 28.1%) lower levels than NW white men; obese NH men had 23.7% (95% CI: 2.9%, 40.0%) lower levels than NW NH men; and obese Japanese men had 18.4% (95% CI: 7.5%, 28.1%) lower levels than NW Japanese men. Although not statistically significant, obesity was associated with lower melatonin levels among AA (13.9% lower, 95% CI: 29.6% lower, 5.2 % higher) and Latino (8.6% lower, 95% CI: 28.5% lower, 17.0% higher) men. **Conclusion** To our knowledge, this is the first study looking at the association between obesity and melatonin levels in a diverse population of men. We found that obese men had lower melatonin levels and that melatonin levels and obesity rates differed by racial groups. These findings will be expanded on to investigate the interplay between melatonin, obesity and race/ethnicity on risk of prostate cancer and potentially point to an underlying reason for racial disparities in cancer.

C047 Internal smoking dose is associated with specific blood DNA methylation patterns across race/ethnicity: The Multiethnic Cohort Study. Sungshim L Park¹, Yesha Patel¹, Lenora W.M. Loo², Annette Lum-Jones², Maarit Tiirikainen², Sharon Murphy³, Kimberly Siegmund¹, Daniel O. Stram¹, Loic Le Marchand². ¹University of Southern California, Los Angeles, CA, USA, ²University of Hawaii Cancer Center, Honolulu, HI, USA, ³University of Minnesota, Minneapolis, MN, USA.

Background: Lung cancer is the most common cancer in the U.S. and leading cause of cancer-related death. We demonstrated in the Multiethnic Cohort Study that for the same number of cigarettes smoked, Native Hawaiians and African Americans have the highest risk compared to whites, while Japanese Americans and Latinos are at lower risk of disease. We showed that internal smoking dose (as measured by total nicotine equivalents (TNE)) per cigarette differs across race/ethnicity; in part explaining why African Americans have a higher risk of disease and Japanese Americans have a lower risk. DNA methylation of CpG sites from cigarette smoking is one of the most common epigenetic modifications linked to lifestyle. Although many smoking-related DNA methylated CpG sites have been identified, these studies have been primarily conducted in populations of European ancestry. Moreover, the influence of internal smoking dose on the epigenome across populations has not been investigated. Here, we report on an epigenome-wide association study for urinary TNE, an optimal marker of internal smoking dose that is not biased by self-report and reflects the interindividual variation in nicotine metabolism. **Methods:** This study includes 1,996 current smokers at time of specimen collection, from five racial/ethnic groups: African American (n=364), European American (n=398), Japanese

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American (n=523), Native Hawaiian (n=311) and Latino (n=400). Genome-wide DNA methylation in blood leukocytes was measured using the Illumina MethEPIC BeadChip. Models were adjusted for age at biospecimen collection, genetic ancestry, sex, and cell-type. Results: TNE was associated with the differential methylation levels of 1,178 probes (Bonferoni corrected $p < 5 \times 10^{-8}$). The top 5 overall significant associations were in AHRR (cg05575921; $p = 1.58 \times 10^{-131}$ and cg23576855; $p = 7.64 \times 10^{-72}$), 2q37.1 near ALPPL2 (cg21566642; $p = 6.29 \times 10^{-81}$), RARA (cg17739917; $p = 1.41 \times 10^{-74}$) and PRSS23 (cg14391737; $p = 1.42 \times 10^{-71}$). These had previously been associated with smoking status. By race/ethnicity, level of significance and the number of significantly differentially methylated probes differed. For instance, in African Americans the second most significantly associated probe was cg25845814, in ELM5AN1, ($p = 1.19 \times 10^{-10}$). This probe was also statistically significant in Japanese Americans ($p = 1.69 \times 10^{-13}$) and Latinos ($p = 2.93 \times 10^{-16}$), but not in European Americans ($p = 1.33 \times 10^{-6}$) and Native Hawaiians ($p = 1.48 \times 10^{-6}$). Cg25845814 has been found to regulate miRNA MIR1268A, which may modify hepatocellular carcinoma risk. European Americans had the greatest number of differentially methylated probes (n=68), followed by Latinos (n=63), Japanese Americans (n=63), African Americans (n=10) and Native Hawaiians (n=9). Conclusions: Smoking dose, as measured by TNE, may differentially impact DNA methylation of leukocytes by race/ethnicity. These differences may help to explain the population differences in smoking-related lung cancer risk.

C048 Multiethnic polygenic risk scores and smoking interactions for chronic obstructive lung disease. Linda M. Polfus¹, Meng Lin¹, S. Lani Park¹, David Conti¹, Jackie Porcell¹, Veronica W. Setiawan¹, Lynne Wilkens², Christopher A. Haiman¹, Loïc Le Marchand², Daniel O. Stram¹. ¹University of Southern California, Los Angeles, CA, USA, ²University of Hawaii, Honolulu, HI, USA.

Background: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death in the US with differential risk across race/ethnicity groups and increases lung cancer risk. In the Multiethnic Cohort (MEC), an ethnically diverse prospective cohort (>215,000) established in the early 1990's in California and Hawaii, we found COPD prevalence was highest in African Americans, followed by European Americans, Native Hawaiians, Latinos and Japanese Americans. Family history and smoking are strong risk factors for COPD with heritability estimates ranging from 20-40%. However, large scale genomic studies (GWAS) have primarily focused on Europeans. Thus, ethnic-specific

calibration of polygenic risk scores (PRS) for predicting COPD has the potential to identify those with greatest need for recommended screening and targeted prevention. Methods: Incident COPD case status was identified from linkage to Medicare claims files which followed a total of 17,291 for PRS analyses from 1998-2014. We performed Cox regression accounting for pack-years smoked and duration quit at two time points of 3,917 COPD cases with genetic data. Genotyped data from MEC individuals from multiple SNP arrays were imputed to the Haplotype Reference Consortium panel (~39 million SNPs). From this repository, we extracted 82 independent risk loci identified from the largest (250,000 European individuals) lung function/ COPD GWAS to date from the UK Biobank. To calculate the COPD PRS, we matched imputed dosages to the 82 reported UK Biobank risk allele by locus and summed MEC genotypes under a standard additive general linear model. We compared two Cox regression models 1) not including PRS and 2) including PRS. Results: From epidemiologic analysis, we find that smoking is highly predictive of COPD risk (as expected) and that even after adjusting for pack-years of smoking and years quit racial disparities are evident, with African Americans (Hazard Ratio (HR): 1.25, $p = 3.7 \times 10^{-6}$) and Japanese Americans (HR: 1.14, $p = 0.017$) having slightly increased risk of disease compared to European Americans; whereas, Native Hawaiians have similar risk as European Americans (HR=0.95, $p = 0.48$) and Latinos have decreased risk (HR: 0.75, $p = 2.43 \times 10^{-8}$). Testing the PRS, we found an 8% increase risk per standard deviation (HR:1.08, $p = 5.41 \times 10^{-6}$) while ethnic group differences in risk remained quite similar after adjustment for the PRS. Testing for interaction between pack-years and PRS, we found a suggestive increase of the smoking effect for those with the highest levels of PRS ($p = 0.09$). Conclusion: Based on the racial disparities present from our COPD findings, particularly the increased risks among African Americans and Japanese Americans, we will examine the excess relative risk over a lifetime and within 5-year age intervals. We are currently expanding our MEC genotyped repository which should double our sample size, improve ability to detect PRS-smoking interactions, as well as test PRS for lung cancer.

C049 A common microRNA-flanking variant (rs13136737) in hsa-miR-302/367 affects risk of prostate cancer progression in young men. Ronald L Heimark¹, Kelsey Guest¹, Virginia Ware², Kari Hernandez¹, Brenna Rheinheimer¹, Jessica M Patnode², Raquel Dias², Mitchell Sokoloff¹, Jason A Wilder². ¹University of Arizona Cancer Center, Tucson, AZ, USA, ²Northern Arizona University, Flagstaff, AZ, USA.

A clinical challenge in prostate cancer (PCa) is identifying the characteristics of primary lesions that give rise to metastatic disease so that patients receive immediate treatment. Genetic variation in microRNA (miRNA) genes can affect mature miRNA biogenesis and/or mRNA targeting, which can consequently influence cancer susceptibility and progression. We identified an under-studied genetic variant (rs13136737, G/T) that is near the 3' end of the polycistronic primary miRNA, *hsa-miR-302/367*, which we show to be biofunctional. In this study we investigated the biological effects and clinical consequences of this sequence variant in PCa. We found that production of mature miRNAs from the *hsa-miR-302/367* cluster is dependent on rs13136737 genotype, and that the T-allele primary transcript is inefficiently processed with respect to production of mature miR-302d and miR-367. To evaluate the consequences of rs13136737 germ line variation we genotyped the locus in a mixed-race cohort of prostate cancer patients and tested for an association with cancer stage at diagnosis as an indicator of aggressiveness. We observed an age-dependent association between rs13136737 genotype and increased risk of advanced stage PCa which was present only in younger men [<65 years, OR = 3.13, 95% confidence interval 1.46 – 7.52; $p=0.003$] and replicated this association in an independent data set of African-American men [OR: 1.58; 95% confidence interval 1.10 – 2.26; $p=0.013$]. When the cancer risk of the polymorphism was stratified with age in an African American population, the 45-54 years of age group shows significance ($p=0.0374$) whereas there was no significant association in older men. This suggests SNP rs13136737 T allele is associated with risk in early-onset PCa patients. The consistency of this result in discovery and validation datasets, which varied substantially in their racial composition, suggests that rs13136737 genotype may be a robust biomarker for risk of advanced stage PCa among younger men. The rs13136737 risk allele (T) occurs at high frequencies in European, South Asian, Hispanic, and Native American populations (0.51, 0.52, 0.57, and 0.71, respectively) and at relatively low frequency in African/African-American populations (0.12). This indicates that the clinical utility of rs13136737 will be sensitive to patient ancestry due to variation in the frequency of the risk allele.

C050 Association between outdoor air pollution and breast cancer survival: The Multiethnic Cohort Study. [Iona Cheng](#)¹, Juan Yang¹, Chiuchen Tseng², Jun Wu³, Shannon M Conroy⁴, Salma Shariff-Marco¹, Scarlett Lin Gomez¹, Alice Whittemore⁵, Daniel O Stram², Loic Le Marchand⁶, Lynne R Wilkens⁵, Beate Ritz⁷, Anna H Wu². ¹UC San Francisco, San Francisco, USA, ²USC, Los Angeles, USA, ³UC Irvine, Irvine, USA, ⁴UC

Davis, Davis, USA, ⁵Stanford, Palo Alto, USA, ⁶UH, Honolulu, USA, ⁷UC Los Angeles, Los Angeles, USA.

Background: There are now 3.1 million breast cancer (BC) survivors with 4.5 million survivors projected by 2030. This high and growing burden speaks to the need of identifying modifiable factors that influence BC survival. Particulate matter (PM) air pollutants have been associated with increased mortality for cardiovascular disease (CVD) and several cancers. However, few studies have examined the impact of air pollution on mortality among BC cases. Within the Multiethnic Cohort (MEC), we examined the association between outdoor air pollution and mortality among African American (AA), Latino (LA), Japanese American (JA), and White (WH) women diagnosed with BC. Methods: Kriging interpolation of air pollution data from air monitoring stations was used to estimate PM_{2.5}, PM₁₀, and nitrogen oxides (NO_x, NO₂) exposures for 3,089 BC cases in the MEC, residing largely in Los Angeles County, linked to residential histories from date of diagnosis to date of death or 12/31/2013. Cox proportional hazard models were used to examine the association between time-varying air pollutants and mortality, accounting for age at diagnosis, race/ethnicity, marital status, chemotherapy, hormone therapy, radiation, surgery, stage, grade, hormone receptor status, tumor size, body mass index, smoking, alcohol, age at first birth, diabetes, CVD, and neighborhood socioeconomic status. All-cause, BC, CVD, non-BC/non-CVD mortality outcomes were evaluated. Stratified analyses were conducted by race/ethnicity, hormone receptor status, and stage. Results: Among the 3,089 BC cases, there were 1,125 all-cause deaths (474 BC, 272 CVD, and 379 non-BC/non-CVD) with an average of 8.1 years of follow-up. PM_{2.5} (per 10 μ g/m³), PM₁₀ (per 10 μ g/m³), NO_x (per 50 ppb), and NO₂ (per 20 ppb) were associated with risk of all-cause (hazard ratios (HRs) range=1.25-1.72; p 's<0.004) and CVD mortality (HR range=1.62-3.93; p 's<0.0005). For AA cases, PM_{2.5}, PM₁₀, and NO_x were associated with risk of CVD mortality (HR range=1.69-3.81; p 's<0.04). For WH cases, PM_{2.5}, PM₁₀, and NO_x were associated with risk of all-cause mortality (HR range=1.48-3.06; p 's<0.02). Risk patterns were similar for LA and JA cases although associations did not reach statistical significance. For hormone receptor positive BC, PM_{2.5} and NO_x were associated with risk of all-cause and CVD mortality (HR range=1.59-2.92, p 's<0.006). For hormone receptor negative BC, NO_x was associated with risk of CVD mortality (p <0.01). For localized BC, PM_{2.5} and NO_x were associated with risk of all-cause, CVD, and non-BC/non-CVD mortality (p 's<0.04). For advanced BC, PM_{2.5} and NO_x were associated with CVD mortality (p 's<0.005). Conclusion: These findings provide strong evidence that air pollution is

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associated with overall and CVD mortality among BC cases, although no effect was found on risk of death due to BC. Moreover, it is essential to maintain stringent clean air laws. Future confirmatory studies and better understanding of the mechanisms of action are needed.

C051 Intersection of race/ethnicity and neighborhood socioeconomic status on all-cause mortality in California and Hawaii: The Multiethnic Cohort Study. [Iona Cheng](#)¹,

Shannon M Conroy², Lynne R Wilkens³, Salma Shariff-Marco¹, Juan Yang⁴, Anna H Wu⁵, Scarlett Lin Gomez¹, Loic Le Marchand³. ¹UC San Francisco, San Francisco, USA, ²UC Davis, Davis, USA, ³UH, Honolulu, USA, ⁴UC San Francisco, San Francisco, USA, ⁵USC, Los Angeles, USA.

Background: The persistent inequality in health outcomes across race/ethnicity requires addressing the complex relationships of social determinants of health. We evaluated the joint effects of race/ethnicity, neighborhood socioeconomic status (nSES), and state of residence on all-cause mortality among African American, Japanese American, Latino, Native Hawaiian, and White participants of the Multiethnic Cohort Study (MEC). Methods: Baseline residential addresses of MEC participants (recruited at age 45-75 in 1993-1996) were geocoded and linked to census block group measures of nSES, composite scores based on California (CA) and Hawaii (HI) 1990 census data, capturing education, poverty, occupation, unemployment, income, and rental/property value. Cox proportional hazards models were used to examine the joint associations of race/ethnicity, nSES, and state of residence with all-cause mortality, adjusting for age, sex, smoking status, body mass index, physical activity, alcohol intake, total energy intake from fat, coffee intake, marital status, comorbidities, and clustering effects by census block group. All hazard ratios (HRs) were compared to Japanese Americans residing in high SES neighborhoods in HI as this group had the lowest mortality. Results: Among 186,034 MEC participants, there were 63,799 all-cause deaths from 1993-2013. All residents living in low SES neighborhoods, regardless of race/ethnicity and state, and several high SES groups exhibited significantly higher risk of mortality compared to the reference group. Japanese Americans residing in low SES neighborhoods experienced higher risk of mortality in HI (HR=1.11; 95% CI: 1.07-1.16) and CA (HR=1.13; 95% CI: 1.07-1.19). The higher risk among CA Latinos residing in low SES neighborhoods (HR=1.39; 95% CI: 1.35-1.44) was significantly greater ($p < 0.01$) than among their CA Latino counterparts in high SES neighborhoods (HR=1.24; 95% CI: 1.18-1.30). Whites residing in low SES neighborhoods in HI (HR=1.52; 95% CI: 1.45-1.59) had similar

hazard ratios as Whites and African Americans residing in high SES neighborhoods in CA (HR=1.50; 95% CI: 1.42-1.58 and HR=1.47; 95% CI: 1.39-1.54, respectively). In addition, CA Whites residing in low SES neighborhoods experienced a similar hazard ratio (HR=1.74; 95% CI: 1.66-1.83) as CA African Americans residing in low SES neighborhoods (HR=1.75; 95% CI: 1.69-1.81). Native Hawaiians residing in low SES neighborhoods experienced the highest risk of mortality (HI HR=2.01; 95% CI: 1.90-2.13; CA HR=2.59; 95% CI: 1.86-3.61), while their counterparts in high SES neighborhoods in HI were also at elevated risk (HR=1.63 95% CI: 1.55-1.72). Conclusion: These findings illustrate how an intersectional approach can elucidate the interconnections between race/ethnicity and nSES on health outcomes. Future directions will further investigate cancer mortality and other cause-specific outcomes in relation to multilevel risk factors to generate clues on the reasons for these disparities.

C052 Association between benzene, a hazardous air pollutant, and lung cancer risk: The Multiethnic Cohort Study. [Iona Cheng](#)¹,

Chiuchen Tseng², Jun Wu³, Juan Yang¹, Salma Shariff-Marco¹, Jennifer Jain¹, S. Lani Park², Scott Fruin², Timothy Larson⁴, Scarlett Lin Gomez¹, Lynne Wilkens⁵, Daniel Stram², Loic Le Marchand⁵, Beate Ritz⁶, Anna H Wu². ¹UCSF, San Francisco, CA, USA, ²USC, Los Angeles, CA, USA, ³UC Irvine, Irvine, CA, USA, ⁴U of Washington, Seattle, WA, USA, ⁵U of Hawaii, Honolulu, HI, USA, ⁶UCLA, Los Angeles, CA, USA.

Background: Benzene is classified as a Group 1 carcinogen in humans. A major pathway of benzene exposure is through inhalation of ambient air contaminated by emissions from motor vehicle exhaust, gas stations, industry, tobacco smoke, and other consumer products. Prior studies of benzene and lung cancer have been limited largely to occupational studies. We examined the association between outdoor air exposure to benzene and lung cancer risk in the large population-based Multiethnic Cohort Study (MEC), including four major U.S. racial/ethnic groups—African Americans, Latinos, Japanese Americans, and Whites. Methods: Ambient benzene exposure was estimated from EPA data from air monitoring stations that were within 20 km of residences of 97,288 MEC participants, largely from Los Angeles County, from the time-period of recruitment (1993-1996) through 12/31/2013. Cox proportional hazards models were used to examine the associations between time-varying benzene exposure and lung cancer risk (cases=2796), adjusting for age, sex, race/ethnicity, smoking, family history of lung cancer, marital status, education, occupation, use of nonsteroidal anti-inflammatory drugs, body mass index, alcohol consumption,

physical activity, intake of total calorie, red and processed meats, and neighborhood (block group) socioeconomic status. Stratified analyses were conducted by sex, race/ethnicity, and smoking status. In addition, subgroup analysis was conducted by histologic cell-type (adenocarcinoma, squamous cell carcinoma, small cell carcinoma, large cell, and not otherwise specified carcinoma). Results: Ambient benzene exposure was associated with increased risk of lung cancer (per 1 ppb hazard ratio (HR)=1.18; 95% CI: 1.03-1.35). Slightly higher hazard ratios were observed in females (HR=1.28; 95% CI: 1.05-1.56) in comparison to males (HR=1.12; 95% CI: 0.92-1.35). There was evidence of heterogeneity in associations by race/ethnicity (p heterogeneity=0.02). Specifically, benzene exposure was associated with increased lung cancer risk among African Americans, Japanese Americans, and Latinos (HR ranged 1.18 to 1.42 per 1 ppb), but was inversely associated with risk among Whites. Also, similar associations were seen among ever smokers (HR=1.19; 95% CI: 1.03-1.37) and never smokers (HR=1.25; 95% CI: 0.82-1.89). Across histologic-cell types, a borderline statistically significant association was seen with adenocarcinoma, the most common cell type (HR=1.25, 95% CI: 0.99-1.58). A smaller hazard ratio was observed for squamous cell carcinoma, the stronger smoking-related cell type (HR=1.09, 95% CI: 0.81-1.47). Conclusions: Benzene exposure adversely impacts the risk of lung cancer in the general population but particularly in non-Whites after adjusting for smoking, occupational and other exposures. Additional large population-based studies are needed to confirm this finding and reinforce the need for stringent clear air laws.

C053 Testicular cancer in Hispanics: Incidence of subtypes over time according to neighborhood sociodemographic factors in California. [Mindy C DeRouen](#)¹, Meg McKinley², Sumit A Shah³, Hala T Borno⁴, Rhonda Aoki⁵, Daphne Y Lichtensztajn¹, John T Leppert⁶, James D Brooks³, Benjamin Chung³, Scarlett L Gomez⁴, Iona Cheng⁴. ¹University of California, San Francisco, San Francisco, CA, USA, ²Greater Bay Area Cancer Registry, San Francisco, CA, USA, ³Stanford School of Medicine, Stanford, CA, USA, ⁴University of California San Francisco, San Francisco, CA, USA, ⁵Stanford University, Stanford, CA, USA, ⁶Veterans Affairs Palo Alto Health Care System, Palo Alto, CA.

Background: Hispanic men in the U.S. experience the second-highest incidence rate of testicular cancer, behind non-Hispanic (NH) White men. Incidence of testicular cancer is increasing in the U.S., despite reports of a plateau during the 1990's, and increases are especially steep in the Hispanic population. To date, the literature does not address whether

the incidence of testicular cancer or the observed increases in incidence differ according to neighborhood factors. Purpose: We examined incidence rates and changes in incidence over time for testicular cancer histologic subtypes (i.e., seminoma and nonseminoma) according to neighborhood socioeconomic status (nSES) among Hispanic and, for comparison, NH White men, and according to neighborhood ethnic enclave among Hispanic men, using California Cancer Registry Data. Methods: We conducted a population-based study of 12,228 Hispanic and NH White men diagnosed with testicular cancer in California during three pericentral periods 1988-1992, 1998-2002, and 2008-2012. We calculated incidence rates according to nSES and, among Hispanics, according to ethnic enclave. Incidence rate ratios were calculated to compare incidence rates across nSES and ethnic enclave and to examine changes in incidence rates over time. Results: Hispanic men residing in high SES neighborhoods, compared to low SES neighborhoods, had greater incidence of both seminoma and nonseminoma testicular cancer across pericentral periods (2008-2012, high to low nSES, seminoma IRR, 1.67; 95% CI, 1.38-2.02 and nonseminoma IRR, 1.22; 95% CI, 1.00-1.48). Hispanic men residing in low ethnic enclave neighborhoods also had higher incidence of both seminoma and nonseminoma across pericentral periods. Between the periods 1998-2002 and 2008-2012, Hispanic men residing in low SES neighborhoods experienced increased incidence of seminoma (IRR, 2008-2012 compared to 1998-2002, 1.39; 95% CI, 1.17-1.65) while those residing in both low and middle SES neighborhood experienced increased incidence of nonseminoma (IRR, 2008-2012 compared to 1998-2002 for low nSES, 1.87; 95% CI, 1.57-2.20 and for middle nSES, 1.48; 95% CI, 1.21-1.79). Conclusions: While Hispanic men residing in neighborhoods with higher SES and lower enclave status have greater incidence of both seminoma and nonseminoma testicular cancer, recent increases in incidence are driven by Hispanic men residing in lower SES neighborhoods, particularly for the nonseminoma histologic subtype.

C054, PR08 Neighborhood-level social determinants impact non-small cell lung cancer aggressive somatic phenotypes. [Loretta Erhunmwunsee](#), Hengrui Hu, Catherine Raquel, Lisa N Lopez, Jenny Shen, Lennie Wong, Jae Y. Kim, Dan J. Raz, Karen L. Reckamp, Ravi Salgia, Stacy W. Gray. City of Hope, Duarte, CA.

Background It is unclear why poor Americans die of non-small cell lung cancer (NSCLC) at a significantly higher rate than their affluent counterparts. We aimed to evaluate the relationship between (1) social determinants of health (SDH) (e.g., pollution, education), (2) cigarette smoke, and

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(3) aggressive NSCLC somatic biological phenotypes (e.g., KRAS G12C and G12V and TP53 mutations) in smoking and non-smoking patients with NSCLC. We hypothesize that adverse social determinants will be associated with more aggressive NSCLC tumor biology. **Methods** We conducted a single institutional retrospective cohort study of patients seen at the City of Hope National Medical Center from 2015-2018. Clinical data were obtained from electronic medical records. Risk factor data (air quality measure [PM 2.5 exposure], neighborhood-level income, education, and minority population data) were obtained from the Environmental Protection Agency (EPA). Associations were modeled using logistic regression models, controlling for all demographic variable (TP53) or variables significant on bivariate analyses (KRAS variants G12C and G12V). **Results** Of 812 NSCLC patients, 617 (76%) had somatic genomic testing and were included in analyses (mean age 67.6, 53% female, 30% Asian, 4% African American, 64% White, 10% Hispanic, 64.3 % Stage 4, 83% adenocarcinoma, and 38% never smokers). Smokers had a mean pack-year of 20. 22% of patients had KRAS mutations and 42.6% had TP53 mutations. For neighborhood level exposures, the mean PM 2.5 level was 11.7 $\mu\text{g}/\text{m}^3$. (US average is 9.5 $\mu\text{g}/\text{m}^3$). Patients were almost evenly distributed in the good and moderate PM2.5 risk categories (good 47.6%, moderate 52.4%). There was no overall association between SDH and KRAS mutations. However, multivariable analyses revealed that lower neighborhood education (OR=15.98, 95%CI 1.5-170.4) was associated with KRAS variants G12C and G12V specifically. Poor air quality as measured by PM2.5 was associated with TP53 mutations (OR=2.09, 95%CI 1.33-3.29). **Conclusion** Poor air quality is associated with increased risk of TP53 mutations, while low neighborhood-level education is associated with KRAS G12C/G12V mutations. Our study finds a link between adverse neighborhood-level social determinants and aggressive biological NSCLC behavior. These hypothesis generating findings suggest a mechanism by which deprived NSCLC populations may experience inferior outcomes. Larger, prospective studies are needed to further evaluate these associations.

C055 Determinants of high-risk prostate cancer among African American and White men in California: The RESPOND study (Research on Prostate Cancer in Men of African Ancestry: Defining the Roles of Genetics, Tumor Markers and Social Stress). David J Press¹, Salma Shariff-Marco², Daphne Y Lichtensztajn², Kirsten Beyer³, Yuhong Zhou³, Joseph Gibbon⁴, Mindy C DeRouen², Richard Pinder⁵, Ann S Hamilton⁵, Christopher Haiman⁵, Iona Cheng², [Scarlett Gomez](#)². ¹University of Chicago, Chicago, IL, USA, ²University of California, San Francisco, San Francisco, CA, USA, ³Medical

College of Wisconsin, Milwaukee, WI, USA, ⁴San Diego State University, San Diego, CA, USA, ⁵University of Southern California, Los Angeles, CA, USA.

Background: African American (AA) men are more likely than non-Hispanic White (White) men to be diagnosed with high risk prostate cancer (PCa) and are more likely to die of their disease. The reasons for this disparity remain unclear. As AA men are exposed to greater levels of social stressors including structural racism (racial bias and redlining), local segregation, and lower neighborhood socioeconomic status (nSES), these factors may contribute to poorer PCa outcomes. **Methods:** As part of the RESPOND study, we assembled geocoded data from the California Cancer Registry on all AA and White PCa cases diagnosed 2004-2013. We appended block group data on a composite index of nSES, two measures of structural racism (redlining & racial bias in mortgage lending), two measures of local segregation (typology of racial/ethnic combinations & location quotient (LQ) of relative concentration of AAs in a block group compared to the Metropolitan Statistical Area), and a measure of %AA. Using multivariable logistic regression models adjusted for year and age at diagnosis, marital status, and health insurance type, PCa risk group was modeled as a binary variable based on NCCN criteria that combines PSA, Gleason grade, and TNM stage; these components were also assessed separately as binary outcomes. **Results:** Among 16,646 AA and 103,078 White PCa cases with measurable NCCN risk, 30.9% of AA and 26.2% of White men were diagnosed with high risk PCa. In multivariable models, residence in the lowest nSES quintile was associated with 1.4 times the odds of high NCCN risk relative to residence in the highest nSES quintile (odds ratio (OR)=1.4, 95% confidence interval (CI)=1.3-1.5 for White men; OR=1.4, 95% CI=1.2-1.6 for AA men). However, after adjusting for nSES, the structural racism and local segregation measures were significantly associated with NCCN risk only among White but not among AA men. Among White men, more pronounced associations with all of these neighborhood factors and high risk PCa were seen in models of high PSA than in models of high grade or advanced stage. Among AA men, the only significant association between any of the structural racism and local segregation measures, independent of nSES, was between redlining and high grade (OR=1.3, 95% CI= 1.1-1.5). In models comparing AA to White men, nSES contributed to nearly 40% of the AA-White disparity in odds of high NCCN risk, with larger contributions to models of PSA than stage or grade. **Conclusions:** Further research is needed to understand mechanisms for how residence in low SES neighborhoods contribute to the disparity in high risk PCa, especially high PSA, among AA men. Given differential associations of the structural racism and local segregation measures between AA

and White men, at least in California data, they are unlikely to be major contributors to racial/ethnic disparities in high risk PCa, independent of nSES. California has less variability in these measures than other states. Expanded analysis with data from the other six RESPOND sites may reveal different results.

C056 Application of precision public health approaches to maximize limited resources for community-based liver cancer prevention educational sessions. Evelyn T Gonzalez, Min Nguyen, Shannon Lynch. Fox Chase Cancer Center, Philadelphia, PA, USA.

Objectives: To address the growing liver cancer burden in the city of Philadelphia and support precision public health, we utilized existing data resources from our community health partners and the PA Department of Public Health to conduct a geospatial analysis that identified communities at the census tract level with both a higher than expected rate of liver cancer and a strong community partner presence to target for liver cancer prevention education. Methods: Pennsylvania(PA) Liver Cancer Registry data from 2007-2014 were linked to the address location of community partners associated with the Fox Chase Cancer Center at the census tract (CT) level using ArcGIS software. Space-time scan statistics (SatScan software) identified CTs with significantly elevated rates of incident liver cancer (p -value <0.05), adjusting for age, gender, race/ethnicity, diagnosis year. Point locations of community partners were plotted against liver cancer cluster maps to identify existing community partners in those areas where liver cancer rates were higher than expected in Philadelphia. The Office of Community Outreach (OCO) worked with community partners in high risk areas to deliver bilingual (English-Spanish) liver cancer education sessions. Plain language materials were then developed by the OCO to support the program. Pre-post tests were administered utilizing automatic response system to assess the impact and utility of the educational sessions and the likelihood to change behavior. Results: Of the 386 census tracts in Philadelphia, 153 were found to have higher than expected rates of liver cancer. 15 of 65 existing community partners were located in a high risk census tract. OCO staff have embarked on an educational outreach initiative, working with the identified community partners, offering bilingual education. Preliminary results from pre-post surveys will be analyzed and presented. Conclusions: Coupling disease cluster and community partner data improves the identification of areas with a liver cancer burden and reduces intervention targets. These methods could be utilized in other cancer control settings to maximize limited resources and prioritize cancer prevention efforts.

C057 Neighborhood disadvantage is associated with liver cancer treatment and survival. Robert B Hood, Ashley Felix. The Ohio State University; College of Public Health, Columbus, OH, USA.

Liver cancer is the 5th leading cause of cancer mortality in the United States and is predicted to increase in the US as a consequence of the opioid epidemic. Associations between individual-level risk factors, such as socioeconomic status, and liver cancer survival have been explored; however, the role of neighborhood-level factors, such as neighborhood deprivation, are noticeably absent from the literature. We explored the association between greater neighborhood deprivation and disparities in tumor characteristics, treatment and 5-year survival among primary liver cancer patients in Ohio diagnosed between 2003 and 2016 using data from the Ohio Cancer Incidence Surveillance System. We restricted our sample to only patients who were 18 years older and who could be geographically linked to a census tract based on their address at diagnosis. We created a neighborhood deprivation index (NDI) using nine variables at the Census tract level including: % less than high school diploma, % college graduates, % at or below the federal poverty line, % unemployed, median household income, % vacancy, % owner occupied units, median house/unit value and % African American. We used principal component analysis to create the index and derived quintiles of deprivation with the higher quintiles reflective of areas with higher deprivation. We examined associations between tumor characteristics and NDI quintile using chi-square tests and ANOVA. We examined concordance with treatment guidelines as binary variable using log-binomial regression. For 5-year survival we utilized Cox proportional hazard models. Confounding variables for each regression model were selected using Directed Acyclic Graphs. After exclusion criteria were applied, 8,208 primary liver cancer patients were included in the study. We observed no statistically significant differences in tumor characteristics by quintile of NDI. However, we found a clear gradient between levels of deprivation and decrease likelihood of receiving guideline-concordant care. Specifically, between the most and least deprived areas, a 25% lower risk (Risk ratio [RR]=0.75; 95% Confidence Interval [CI]=0.67, 0.85) of receiving guideline-concordant care was observed in our adjusted log-binomial regression model. In adjusted survival models we observed an increased risk of death comparing the most and least deprived areas (Hazard ratio [HR]=1.14, 95% CI=1.02, 1.27). Our study suggests a potential negative effect of neighborhood deprivation on treatment concordance and liver cancer survival. Interventions targeting disparities in liver cancer should focus on not only individual level factors but address larger neighborhood level factors as well. Future

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analyses are needed to confirm these disparities observed and determine if similar neighborhood level effects occur in other cancer disparities. This study includes data provide by the Ohio Department of Health which should not be considered an endorsement of this study or its conclusions.

C058 Regional disparities in gastric cancer survival in the United States: An observational cohort study of the Surveillance Epidemiology and End Results Program, 2004-2016. Robert Jeffrey Huang¹, Ann Hsing², Latha Palaniappan³, Joo Ha Hwang³. ¹Stanford University School of Medicine, Stanford, CA, USA, ²Stanford Cancer Institute, Stanford, CA, USA, ³Stanford University School of Medicine, Stanford, CA, USA.

Background/Aims: Within the United States (U.S.) regional disparities in overall mortality exist at both the state and county levels. The epidemiology and outcomes of non-cardia gastric cancer (NCGA) based on geographic region is incompletely studied. Such knowledge would inform resource allocation and targeting of cancer prevention/early detection programs. The aims of this study were to define NCGA-specific mortality in the U.S. according to population-based county-level data, and to analyze the association between county-level attributes (ruralness, educational attainment, poverty, unemployment) and survival. Methods: All NCGAs reported to the Surveillance Epidemiology and End Results Program (SEER) between 2004-2016 were identified; tumor stage, performance of surgical resection, patient-level demographic covariates, survival time, and mortality were captured. Diagnoses were linked to county-level attributes of ruralness, educational attainment, poverty, and unemployment derived from the American Community Survey. Cox proportional hazards regression, adjusted for relevant confounders and effect modifiers, was utilized to identify county-level attributes which impacted survival. Analysis was performed stratified by stage of diagnosis. Results: 48,284 NCGAs from 614 (260 Urban, 354 Rural) counties were included for analysis. Rural counties had significantly worse NCGA-specific survival compared to Urban counties (HR 1.18, CI 1.12-1.23, $p < 0.001$), which remained robust following adjustment for patient- (age, gender, race, ethnicity, insurance status, performance of surgical resection) and county-level (educational attainment, poverty, unemployment) factors. The association of county ruralness with increased hazard remained significant in the subgroup of cancers diagnosed at local or regional stages. County poverty associated with worse survival (HR 1.17, CI 1.09-1.15, $p < 0.001$), which remained significant following adjustment for ruralness and patient-level factors. The association of county poverty with increased hazard remained significant

in the subgroup of cancers diagnosed at local or regional stages. County educational attainment and unemployment demonstrated a modest association with mortality risk, but this was confounded by county poverty. Conclusions: Based on a retrospective cohort analysis using SEER data, there are marked regional differences in NCGA survival at the county level in the U.S. These differences are mediated in part by county measures of ruralness and poverty, and are independent of county racial and ethnic constitution. These data provide a critical opportunity for targeted intervention for high-risk populations to ensure more equitable outcomes, including targeted early detection programs.

C059 A case-control study of risk factors for advanced gastric intestinal metaplasia in a multiethnic United States population (The Stanford GAPS Study). Robert J Huang¹, Sungho Park¹, Tanvi Chitre¹, Jeanne Shen², Teri Longacre², Joo Ha Hwang¹. ¹Division of Gastroenterology, Stanford University School of Medicine, Stanford, CA, USA, ²Department of Pathology, Stanford University School of Medicine, Stanford, CA, USA.

Introduction Gastric intestinal metaplasia (GIM) is a precursor to gastric cancer (GC). It is not cost effective to survey the general American population for progression from GIM onto GC; however, development of risk-stratification models may allow for targeted surveillance. There exist very limited data regarding GIM epidemiology or risk derived from North American populations. The Stanford Gastric Precancerous Conditions Study (GAPS) is an ongoing, prospective study incorporating both 1) a cross-sectional, case-control study of subjects with GIM compared to controls, and 2) a longitudinal evaluation of subjects with GIM to evaluate risk factors for progression. The purpose of GAPS is to both improve the detection of GIM, and to predict risk for progression of GIM onto dysplasia or GC. Methods At time of enrollment in GAPS, all patients complete a standardized questionnaire inquiring about medical, family, dietary, and exposure history. Biopsies are performed from both antrum and body, and bio-specimens from the gastric mucosa, blood, and saliva are collected. Subjects are assigned an operative link for GIM (OLGIM) score based on adjudication by an expert pathologist. Demographic, clinical, and environmental covariates are compared between cases of GIM and controls. Subgroup analysis is performed to compare cases of advanced GIM (defined as OLGIM ≥ 2) and controls. Continuous variables are analyzed using Student's T-test, and categorical variables are analyzed using the Chi-squared test. Results As of July 2019, 44 cases and 49 controls have undergone questionnaire administration, endoscopy, and bio-

specimen collection. Of cases, 23 demonstrate advanced GIM. Subjects with GIM were older (65 vs 56 years, $p < 0.001$), more likely to have a history of *H. pylori* treatment (48% vs 20%, $p = 0.005$), and more likely to be first-generation immigrants ($p = 0.03$) compared to controls. Subjects with advanced GIM were older (65 vs 58 years, $p = 0.03$), and more likely to be first-generation immigrants ($p = 0.04$) compared to subjects without advanced GIM. Differences in family history, smoking status, presence of symptoms, presence of medical comorbidity, and dietary patterns did not reach statistical significance. Discussion Age and immigration status, known risk factors for GC, may also be risk factors for advanced GIM. As advanced GIM significantly increases risk for GC, detection of advanced GIM may improve GC morbidity and mortality. With ongoing enrollment in GAPS, it is hoped that additional environmental risk factors may be isolated from this cohort. Additional research should be focused on non-invasive testing to detect advanced GIM in North American populations.

C060 Does the border play a role? Cancer-related disparities by neighborhood proximity to the US-MX border.

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Background Disparities in cancer outcomes have been documented among populations along the United States (US)-Mexico border. However, the drivers of these disparities have not been well characterized. We sought to identify differences in cancer-related knowledge, attitudes, and behaviors at a granular level, within the 5th largest US county. Methods The University of California, San Diego Moores Cancer Center and San Diego State University Institute for Public Health administered a county-wide assessment to a random sample of 4,000 residents with an additional random sample of 1,000 households in border-adjacent ZIP codes. Mailed in English and Spanish, the survey assessed access to care, health and cancer screening history, cancer beliefs, HPV vaccination, precision medicine knowledge, and socio-demographics. Data collection is ongoing; 494 completed surveys were included in this analysis comparing those residing in border-adjacent ZIP codes (BA; $n = 72$) to the remainder of the county (RC; $n = 422$) using t-tests and chi-square tests. Results Respondents from BA were demographically similar to those from those from RC in mean age and percent female (65 and 59 years; 66% and 63%, respectively). No significant differences were observed

between BA and RC respondents in proportion earning $< \$35,000$ per year (26% versus 16% in RC; $p = 0.05$) or the proportion *finding it difficult or very difficult* on their present income (19% versus 13% in RC; $p = 0.186$). Although slight differences were observed in health care coverage (90% versus 97% in RC; $p = 0.022$), there were no significant differences in access to a usual source of care or age-appropriate colorectal, breast, or cervical cancer screening. Participants from BA were less likely to rate their overall health as *excellent or very good* (34% versus 54% in RC; $p = 0.003$). Agreement with fatalistic cancer statements was higher among BA respondents: 73% agreed that *it seems like everything causes cancer* (50% RC; $p = 0.001$) and 36% agreed that *there is not much you can do to lower your chances of getting cancer* (19% RC; $p = 0.002$). There were more HPV vaccine misperceptions among BA with significantly higher agreement with statements such as: *the HPV vaccine was not properly tested* (36% versus 16% in RC; $p = 0.001$), *the HPV vaccine encourages promiscuity* (31% versus 12% in RC; $p = 0.001$), and *the HPV vaccine can give you HPV and cause cancer* (24% versus 8% in RC; $p = 0.001$). BA residents were less likely to have heard about physician-ordered genetic tests (56% versus 78% in RC; $p < 0.001$) and were less familiar with 9 of 13 precision medicine terms assessed ($p < 0.05$). Conclusions Despite relatively similar levels of health coverage, access to care, and screening adherence, there were significant differences between BA and RC in cancer-related misperceptions, mistrust, and knowledge. Interventions from trusted community organizations that target these areas may begin to reduce cancer disparities among border populations.

C061 Neighborhood racial context and race- and subtype-specific breast cancer incidence among non-Hispanic Black and non-Hispanic White women in California, 2006-2015.

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BACKGROUND: Determinants of racial inequities in risk of

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subtype-specific breast cancers are poorly understood. Features of the neighborhood context may contribute to racial inequities along the breast cancer continuum, however few have examined subtype-specific incidence. Therefore, this study aimed to characterize the association between the neighborhood racial context (housing discrimination and racial composition) and race- and subtype-specific breast cancer incidence among NH Black and NH White women in California. **METHODS:** We merged data from the California Cancer Registry on women aged 20+ diagnosed with primary breast cancer between 2006-2015 with neighborhood racial context at time of diagnosis: census tract % NH Black and a new racial bias index derived using 2007-2013 data from the Home Mortgage Disclosure Act. We used Poisson regression to estimate associations between neighborhood racial context and race- and Luminal A and TNBC (triple-negative breast cancer)-specific incidence rates, adjusting for neighborhood confounders. **RESULTS:** We identified $n=104,716$ cases of Luminal A and $n=15,739$ cases of TNBC over the study period. Among Black women, living in a high % Black census tract was associated with higher incidence of Luminal A (IRRadj=1.16 (1.08, 1.24)) and TNBC (IRRadj=1.17 (1.04, 1.32)) subtypes, relative to residence in low % Black tracts. No statistically significant association between neighborhood racial composition and either subtype was observed among NH Whites, nor between racial bias in mortgage lending and breast cancer among either racial group. **CONCLUSION:** Neighborhood racial composition may proxy cross-cutting social and environmental risk factors for breast cancer, regardless of subtype. These exposures may disproportionately burden Black versus White women with respect to breast cancer risk.

C062 Silent sanctuary city—impacts on women’s healthcare. Mary Kay Dauria. Independent Advocate, Houston, TX, USA.

Houston is world renowned as a city on the cutting edge of medical research and top tier medical facilities. But there is another story. Over 38% of residents of Houston speak a language other than English. A vast majority of this population are not able to get medical insurance and do not get regular health screenings. Although federal monies are available to provide free mammograms and PAP tests for the uninsured, Texas stipulates that a valid Texas ID must be presented to get access. This poster addresses the impact a dedicated group of volunteer medical and lay staff are making to serve the underserved.

C063 Impact of neighborhood socioeconomic status on breast cancer subtypes among Black women. Bo Qin¹, Adana A.M. Llanos², Riddhi Babel², Jesse J. Plascak², Karen Pawlish³, Christine B. Ambrosone⁴, Kitaw Demissie⁵, Chi-Chen Hong⁴, Elisa V. Bandera¹. ¹Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA, ²Rutgers School of Public Health, Piscataway, NJ, USA, ³New Jersey Department of Health, Trenton, NJ, USA, ⁴Roswell Park Comprehensive Cancer Center, Buffalo, NY, USA, ⁵SUNY Downstate Medical Center School of Public Health, Brooklyn, NY, USA.

Background: Compared to White women, African American/Black women are more likely to develop triple-negative breast cancer (TNBC), an aggressive breast cancer subtype. While many studies have examined individual-level socioeconomic status (SES) as a major social determinant of more aggressive breast tumor phenotypes, the impact of neighborhood-level SES (nSES) on breast cancer is not well understood, particularly among Blacks. **Objective:** To evaluate the impact of nSES on breast cancer subtypes among Black women with breast cancer. **Methods:** We evaluated the association of interest among 1,220 Black women with invasive breast cancer from 2006 to 2018 enrolled from 10 counties of New Jersey in the Women’s Circle of Health Study (WCHS). Residential address at diagnosis was geocoded to the census tract-level. Neighborhood SES was measured using the NCI’s census tract-level SES index, a time-dependent score constructed by a factor analysis of seven variables measuring different aspects of census tract SES (education index, percent unemployed, percent working class, median household income, percent below 150% of poverty line, median house value, and median rent). In a case-only analysis, we used multilevel multinomial logistic regressions to estimate nSES in relation to breast cancer subtype (TNBC, HER2-enriched, Luminal B vs. Luminal A). Models were adjusted for individual-level SES variables, body mass index and reproductive factors, and census tract-level percentage of Black residents. We tested whether the associations were modified by percentage of Black residents and participant’s education. **Results:** Higher nSES was found to predict a lower risk of TNBC. Compared to tertile 1 (lowest nSES score), the odds ratio (OR) was 0.91 (95% CI: 0.65, 1.29) for tertile 2 and 0.52 (95% CI: 0.34, 0.79) for tertile 3 (highest nSES score; p -trend: 0.001). Higher nSES was borderline significantly associated with a lower risk of Luminal B (OR: 0.61 comparing highest vs. lowest nSES tertile; 95% CI: 0.36, 1.03; p -trend: 0.055). The inverse association between nSES and TNBC was observed only among Black women living in census tracts with lower proportion of Black residents (p -for-interaction=0.08). Compared to the lowest nSES tertile, OR was 0.38 (95% CI: 0.21, 0.68) for the highest tertile

(p -trend: <0.001). There was a suggestion that the inverse relationship of nSES with TNBC was also more pronounced among women who had relatively lower levels of education. Conclusion: Neighborhood socioeconomic environment may influence the development of TNBC among Black women, which might be buffered by some contextual factors in areas with more Black residents. Further investigation to elucidate these factors is needed.

C064 Neighborhood socioeconomic status, ethnic enclave, and hepatocellular carcinoma incidence in Hispanics and Asians/Pacific Islanders living in California: An update.

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Background: Disparities in hepatocellular carcinoma (HCC) incidence exist by sex and race/ethnicity, with rates higher in men than women and higher in Asians/Pacific Islanders (API) and Hispanics than non-Hispanic Whites. We sought to update previous studies that identified disparities in HCC incidence by neighborhood contextual factors such as SES and ethnic enclave among API and Hispanic populations in California by analyzing data from the California Cancer Registry (CCR) through 2012. Methods: All primary, invasive HCC cases diagnosed from 1988 through 2012 from the CCR were identified and their addresses geocoded. Neighborhood Hispanic or API ethnic enclaves are areas marked by greater immigrant composition and linguistic isolation, applicable to Hispanic and API residents, respectively. Neighborhood SES (nSES) is an index measure comprising data on education, occupation, and housing. Age-adjusted incidence rates (IRs; per 100,000 population; standardized to the 2000 U.S. standard million population), incidence rate ratios (IRRs) (with corresponding 95% confidence intervals (CI)) were calculated for each strata of nSES and ethnic enclave by sex and race/ethnicity. Results: The final analysis included 9,636 males (4,883 Hispanics, 4,753 APIs) and 3,524 females (1,744 Hispanics, 1,780 APIs). During 1988-2012, among Hispanics, there were no clear associations between HCC incidence and nSES or ethnic enclave when considered separately. However, compared to those in high nSES/low enclave neighborhoods, Hispanic males living in low nSES/low enclave neighborhoods and Hispanic females living in low SES/high enclave neighborhoods had higher incidence of HCC (males: IRR = 1.22, CI = 1.10 - 1.36; females: IRR = 1.20, CI = 1.04 - 1.38). Among APIs, there was no association between HCC incidence and ethnic enclave but there was a strong association of increased risk for those living in the

lowest vs. highest nSES neighborhoods (males: IRR = 1.69, CI = 1.53 - 1.87; females: IRR = 1.32, CI = 1.12 - 1.56). API males living in low nSES/high enclave neighborhoods had higher incidence of HCC than those living in high nSES/low enclave neighborhoods (IRR = 1.36, CI = 1.22 - 1.52). Conclusions: We found significant variation in HCC incidence by two important neighborhood factors, nSES and ethnic enclave, among Hispanics and APIs living in California, with similar findings to previous studies. Future studies with longitudinal data are needed to explore which attributes of nSES and enclaves are impacting HCC risk and for which subpopulations (such as recent immigrants).

C065 Multilevel factors associated with depressive symptoms among long-term survivors of childhood cancer.

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Introduction Previous research has identified individual-level clinical and demographic factors associated with the mental health of childhood cancer survivors (CCS), but cultural and contextual factors have not been as thoroughly explored. Additionally, Hispanics are underrepresented in studies of CCS, so improved understanding of unique correlates of mental health among this population is needed. Methods Depressive symptoms were assessed among a sample of 1,106 young adult CCS. Participants were selected from the Los Angeles County SEER Cancer Registry, and were diagnosed at ages 0-19 between 1996-2010 with any cancer, at least 5 years post diagnosis, treated 2+ years ago, currently aged 18-39. Analyses were restricted to Hispanic participants currently living in California (n=522) who completed an acculturation measure. Multivariable linear regression was used to assess the association of depressive symptoms with neighborhood Hispanic ethnic enclave and individual acculturation, controlling for relevant demographic and clinical factors. Ethnic enclave residence was also explored as a potential moderator of the effect of acculturation on depressive symptoms. Ethnic enclave is a composite index based on census data reflecting household linguistic isolation, English language proficiency, and proportion of Hispanics, foreign born, and recent immigrants in a given census tract. This index score was dichotomized for analysis (based on the statewide distribution). A bi-dimensional acculturation scale measured Hispanic and Anglo orientation, but due to limited variability on the Anglo subscale (majority of the sample reported high Anglo orientation), it was excluded from the interaction model to

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focus on differences by Hispanic orientation. Results In a multivariable model of main effects controlling for age, sex, treatment intensity, years since diagnosis, and education, a significant negative association between Hispanic orientation and depressive symptoms was found ($b=-0.17$, $p=0.03$) while no significant association was found for ethnic enclave. When accounting for the interaction, ethnic enclave was found to moderate the association with Hispanic orientation. When stratifying models by enclave, Hispanic orientation was negatively associated with depressive symptoms for those residing in high ethnic enclaves ($b=-0.24$, $p=0.01$), while there was no significant association observed for those residing in low enclaves. Conclusions These results suggest that concordance between an individual's ethnic orientation and the neighborhood cultural context may be protective against poor mental health. One potential mediating factor is increased social support and future research should examine this factor to better understand contributors to mental health across the survivorship continuum among CCS and to identify groups that may benefit from targeted intervention and/or survivorship support services.

C066 Association of ethnic density with social support and social isolation among Chinese immigrants in Philadelphia.

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The Asian American population is the fastest growing minority population in the US. Mental health status in Asian Americans is increasingly recognized as an important determinant of physical health outcomes, but it is understudied in Asian Americans, who are also less likely to seek treatment for mental health problems. Ethnic enclave residence is thought to be protective by providing greater social support and reducing social isolation, but evidence for this is limited and inconsistent, and few studies have focused on Asian immigrants. Our objective was to examine whether Chinese immigrants in areas of higher ethnic density report greater social support and less social isolation. Our analysis included 640 men and women recruited 1/16-5/19 through community organizations and contacts throughout the Philadelphia region. Residences were geocoded and linked to American Community Survey data from 2013-2017. Ethnic density was operationalized as percent of Census tract residents who were Chinese and categorized into quintiles. Social support was assessed using the Provisions of Social Relations scale, which captures support from family and friends, and low social support was defined as a score in the

lowest quintile. Social isolation was assessed using a 17-item scale measuring social disconnectedness and perceived isolation, and high social isolation was defined as a score in the highest quintile. We ran logistic regression models using Generalized Estimating Equations to account for clustering within Census tracts, adjusting for age, sex, and at the Census tract level, median household income and percent of adults in poverty. We found that participants in the highest vs. lowest quintile of ethnic density (mean 12.6% vs. <1% Chinese in Census tract) were less likely to report low social support (odds ratio (OR) 0.40 (95% confidence interval (CI) 0.21, 0.75, trend $p=0.02$), and also less likely to report high social isolation (OR 0.40, 95% CI 0.17, 0.92, trend $p=0.056$). Despite suggestive trend p -values, however, ORs did not decrease in a dose-dependent manner. Our findings support the possibility that ethnic enclaves provide social resources that may protect against mental or even physical health problems. Lack of dose-dependence, however, indicates that the association is more complex and merits further exploration.

C067 Impact of neighborhood socioeconomic status on survival among young patients with acute leukemia in California.

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Introduction: Among young patients with acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML), minority race/ethnicity and lack of health insurance have been associated with lower survival. We sought to evaluate the impact of neighborhood socioeconomic status (nSES) and neighborhood archetype on early mortality and overall survival among patients with ALL and AML in California. We hypothesized that living in low SES neighborhoods will be associated with lower survival among young patients with acute leukemia. Methods: Patients aged 0-39 years reported to the California Cancer Registry with a diagnosis of ALL or AML between 2006 and 2016 were included. Using a previously developed composite measure, nSES quintiles were evaluated as the primary exposure of interest. Latent class analysis was used to

generate neighborhood archetypes based on 39 social and built environment attributes at the block group level, which were evaluated as an exploratory exposure. Patients were observed from diagnosis through last available follow up. Cox proportional hazards univariate models were used to estimate crude hazard ratios (HR) for early death (within 60 days following diagnosis) and overall survival (OS). Results: Of the 8761 patients included, 6338 were diagnosed with ALL and 2423 were diagnosed with AML. Median follow up time was 3.2 and 2.1 years, respectively. Minority race/ethnicity, older age (>19 years), lack of insurance, lack of chemotherapy, and treatment at an adult center were associated with lower OS in univariate models. Patients in the lowest quintile of nSES had an increased risk of early mortality for both ALL (HR 1.91, 95% CI 1.06, 3.47) and AML (HR 2.01, 95% CI 1.17, 3.45) relative to the highest quintile of nSES. Likewise, patients in the lowest quintile of nSES had lower OS for both ALL (HR 2.10, 95% CI 1.68, 2.62) and AML (HR 1.40, 95% CI 1.12, 1.76). A dose effect was observed with worse OS observed among quintiles 2-4 as well. In patients with ALL, relative to the highest status neighborhood archetype, all other neighborhood archetypes demonstrated lower OS, with the most pronounced effects in inner city (HR 2.35, 95% CI 1.79, 3.09), Hispanic small towns (HR 2.33, 95% CI 1.74, 3.11), and mixed SES class suburban neighborhoods (HR 2.27, 95% CI 1.65, 3.12). While there was a suggestion of differences by archetype among AML patients, none reached statistical significance. Conclusions: The substantial crude effect of neighborhood SES on early mortality and overall survival highlights an important disparity. Multivariable adjustment for other known predictors of survival is underway. When other aspects of the social/built environment are incorporated, the magnitude of the effect grows, suggesting that nSES interacts with other neighborhood factors such as the racial/ethnic makeup. The greater effects of neighborhood among ALL patients relative to AML patients may be linked to the prolonged, outpatient nature of the therapy and difficulties with treatment adherence among vulnerable populations.

C068 Association between outdoor air pollution and risk of malignant and benign brain diseases: The Multiethnic Cohort Study. Anna H Wu¹, Jun Wu², Chiuchen Tseng¹, Juan Yang², Salma Shariff-Marco², Veronica W Setiawan³, Shahir Masri², Jennifer Jain², Jacqueline Porcel¹, Scott Fruin¹, Timothy Larson⁴, Florence Hofman⁵, Thomas Chen¹, Loic Le Marchand⁶, Daniel Stram¹, Beate Ritz², Iona Cheng⁷. ¹University of Southern California, Los Angeles, CA, USA, ²University of California, Irvine, CA, USA, ³University of Southern California, Los Angeles, CA, USA, ⁴University of Washington, Seattle, WA, USA, ⁵University of Southern California, Los Angeles, CA,

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Background: The etiology of malignant brain cancer remains largely unknown. The two established risk factors, ionizing radiation and a history of allergies or atopic disease, explain less than 10% of the disease. In 2012, the International Agency for Research on Cancer classified air pollution and particulate matter (PM) as carcinogenic to humans (Group 1). The carcinogenic effects of air pollution may reach the brain via the systemic circulation, crossing the blood-brain barrier. There are increasing concerns about the potential impact of air pollution on outcomes of central nervous system (CNS), including chronic brain inflammation and microglia cell activation, but evidence of its carcinogenic effects is still limited. Methods: Kriging interpolation of air pollution data from monitoring stations were used to estimate long-term exposures of particulate matter pollutants (PM_{2.5}, PM₁₀), gaseous pollutants (oxides of nitrogen (NO_x, NO₂), ozone (O₃), carbon monoxide (CO), and air toxics (benzene) for 103,308 men and women from the Multiethnic Cohort, residing largely in Los Angeles County from recruitment (1993-1996) at age 45-75 through 12/31/2013. Cox proportional hazards models were used to examine the associations between time-varying air pollutant levels and risk of malignant brain cancer (95 men, 116 women) and meningioma (130 men, 425 women) with adjustment for sex, race/ethnicity, neighborhood socioeconomic status, smoking, occupation, and other covariates. Stratified analyses were conducted by sex and race/ethnicity (African Americans, Japanese Americans, Latinos, Whites). Results: In men and women combined, risk of malignant brain cancer appeared to be increased in association with higher exposure to benzene (per 1 ppb HR=1.68, 95% CI:1.00-2.83), O₃ (per 10 ppb HR=1.54, 95% CI: 0.95-2.51) and PM₁₀(per 10 µg/m³ HR=1.24, 95% CI: 0.84-1.82) Malignant brain cancer associations with benzene (P=0.002) as well as PM₁₀ (P=0.03) were driven by the results in men, although the interaction by sex did not reach statistical significance. Brain cancers in Latino men and women accounted for about half of the number of malignant brain cancers in this analysis. Subgroup analyses suggested stronger associations of risk of malignant brain cancer and exposure to PM₁₀ (P=0.03), O₃ (P=0.01), and benzene (P=0.03) in Latino men but not in Latino women. There were no significant associations between air pollution and risk of meningioma, except for a positive association with O₃ exposure (P=0.04) in men. Conclusions: To our knowledge, this is one of the first studies of air pollution and malignant and benign brain cancers to include large numbers of nonwhites and to examine risk patterns by sex. The stronger findings in Latino men and the suggestive male/female

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differences in results are intriguing as there are parallel sex differences in rates of brain diseases and in survival. Confirmation of these air pollution-brain cancer associations in additional diverse populations is warranted.

C069 Body mass index, race, and ovarian cancer: Characterizing changes after diagnosis and associations with overall survival.

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Background: Obesity has been implicated in the progression of ovarian cancer, but associations between body mass index (BMI) and survival outcomes are mixed. Studies evaluating pre- or peri-diagnosis BMI have generally found associations between higher BMI and worse overall survival (OS), but studies with post-diagnosis BMI measures are limited. Furthermore, no existing post-diagnosis BMI and ovarian cancer survival studies have conducted analyses stratified by race. Objective: We undertook this study to characterize changes over time in BMI among ovarian cancer cases from the Vanderbilt University Medical Center (VUMC) and to evaluate associations in relation to overall survival (OS); differences by race were examined in stratified analyses. Methods: We assembled a retrospective cohort of Tumor Registry confirmed ovarian cancer cases from VUMC EMR. BMI (kg/m²) at diagnosis, and 6, 12, 18, and 24 months after diagnosis (± 8 weeks) were used to classify obesity according to the World Health Organization (WHO) guidelines as underweight (<18.5), normal weight (<25), overweight (<30), or obese (≥ 30.0). BMI changes over time were determined by the ratio of the last to first available measure, and categorized as increased (>1.05%), decreased (<0.95), or stable (reference). Associations with OS were quantified by Hazard Ratios (HRs) and 95% Confidence Intervals (CIs) from Cox proportional-hazards regression in multivariable adjusted race-stratified analyses. Results: Among 380 ovarian cancer cases with peri- or post-diagnosis BMI measures available from EMR, the relative prevalence of WHO normal weight cases decreased over time (diagnosis: 40.4%; 6 months: 38.2%; 12 months: 35.5%; 18 months: 27.7%; 24 months: 22.8%); there were more cases who had a decreased BMI (46.6%) than increased BMI (28.4%). Neither the prevalence nor percent of patients with changes differed by race. Among Caucasians (86.8%), a BMI increase was associated with a decreased risk of death (HR: 0.62, 95% CI: 0.40-0.97) while a BMI decrease was associated with an increased risk of death (HR: 2.18, 95% CI: 1.51-3.17). However, this seemed to differ

among African Americans (6.1%), where both an increased and decreased BMI tended to have worse OS. Conclusions: Changes in BMI after a diagnosis of ovarian cancer may have different associations with mortality by race. To further expand upon these preliminary findings, our next steps include conducting analysis with time-varying covariates and identifying collaborators with ovarian cancer cases who have post-diagnosis BMI measures available for additional analysis.

C070 Racial disparities in body mass index and ovarian cancer risk in the OCWAA Consortium.

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Objective: Obesity disproportionately affects African American (AA) women, and there is some suggestion that its association with ovarian cancer risk may be stronger among AA compared to white women, but no study to date has been adequately powered to compare risk between the two populations. The Ovarian Cancer in Women of African Ancestry (OCWAA) Consortium provided a unique opportunity to evaluate the association between body mass index (BMI) and invasive epithelial ovarian cancer (EOC) risk in AA and white women and to estimate the contribution of obesity to ovarian cancer risk in both racial groups. Methods: The OCWAA Consortium is a collaboration of six of the largest epidemiologic studies of ovarian cancer in the United States that include AA women: four case-control and two case-control studies nested within cohort studies. The six studies are the Chicago Case-Control Study, the North Carolina Ovarian Cancer Study, the Los Angeles Ovarian Cancer Case-Control Studies, the African American Cancer Epidemiology Study, the Black Women's Health Study, and the Multiethnic Cohort. BMI before diagnosis was available in all the studies and data on BMI and relevant confounders were harmonized for analyses. There were 1,144 AA cases, 2,910 AA controls, 3,174 white cases, and 9,160 white controls

included. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were computed using random-effects multi-level logistic regression models separately by race and histotype with control for relevant covariates, which included study, age, education, parity, oral contraceptive use, age at menarche and family history of breast/ovarian cancer. Multinomial regression was used for histotype analyses. Population attributable risk (PAR) estimates were computed by race and histotype. Results: The prevalence of obesity (BMI \geq 30 kg/m²) was higher in AAs compared to white women for both cases (53.2% vs 21.4%) and controls (45.7% vs. 18.4%). For EOC, there was little evidence of an association with obesity for white women. For AAs, risk was elevated for BMI \geq 30 kg/m² (ORBMI 30-34=1.37, 95% CI: 1.12, 1.69; ORBMI \geq 35 = 1.26, 95% CI: 0.74, 2.15) relative to BMI 18.5- <25 kg/m². There was an elevated risk for non-high-grade serous EOC for both AA and white women (for AA women, ORBMI 30-34=1.67, 95% CI: 1.14, 2.44 and ORBMI \geq 35 = 1.76; 95% CI: 0.84, 3.69; for white women, ORBMI \geq 35 = 1.39; 95% CI: 1.06, 1.82), but not for high-grade serous EOC. The PAR for BMI \geq 30 was 7.1% (95% CI: 2.4, 15.6) for AAs and 2.6% (95% CI: -0.3, 5.4) for whites for all EOC. For non-high-grade serous EOC, the PAR was 16.5% (95% CI: 3.4, 28.2) for AAs and 6.4% (95% CI: 2.2, 10.3) for whites. Conclusions: Obesity was a contributor to overall EOC risk among AA women but not among white women. Obesity did not contribute to the risk of high-grade serous EOC for AAs or whites, but it was associated with non-high-grade serous cases among both AA and white women. The association with non-high-grade serous EOC was greater among AAs than whites.

C071 Racial/ethnic disparities in weight, weight change in adulthood, and pancreatic cancer incidence: The

Multiethnic Cohort. Albert J Farias¹, Daniel O Stram², Songren Wang², Stephen J Pandol³, Kristine R Monroe², V. Wendy Setiawan¹. ¹Department of Preventive Medicine, Keck School of Medicine, University of Southern California, Norris Comprehensive Cancer Center, Los Angeles, CA, USA, ²Department of Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA, ³Division of Gastroenterology, Departments of Medicine, Cedars-Sinai Medical Center and Department of Veterans Affairs, Los Angeles, CA, USA.

Purpose: Japanese Americans, Native Hawaiians and African Americans have a higher incidence of pancreatic cancer compared to non-Hispanic whites that cannot be explained by the rates of obesity or absolute body weight. While absolute body weight in adulthood is positively associated with pancreatic cancer risk, the effect of weight change

throughout adulthood, particularly among a racially diverse population, is not well documented for this high-risk group. Methods: This population-based prospective cohort study included 155,308 participants enrolled in the Multiethnic Cohort from 1993-1996 (median follow-up = 20.2 years). We identified 1,328 participants diagnosed with incident primary invasive pancreatic cancer from the linked cohort data with the Hawaii and California SEER registries. Participants diagnosed with other cancers were excluded from the cohort analysis. Body weight at 21 years old and at baseline enrollment (age 45 or older) were assessed using a self-administered questionnaire at cohort entry. Multivariable Cox proportional hazards regression models were used to determine the association between weight change from age 21 to cohort entry and pancreatic cancer risk adjusting for known risk factors such as smoking status, physical activity, alcohol intake, family history of pancreatic cancer and other sociodemographic characteristics. Results: The mean age at cohort entry was 59.3 years (SD 8.9) and the largest proportion of the cohort were Japanese American (30.1%), White (25.0%), and Latino (21.8%), respectively. The mean weight change from age 21 to baseline age was 28 pounds (SD 26.7). We observed that increased risk of pancreatic cancer was associated with weight at age 21 (HR 1.06; 95% CI 1.03-1.09, per 10-pound increase; p-trend<0.001) and weight at baseline (1.03; 1.00-1.05, per 10-pound increase; p-tend=0.03). Weight gain through adulthood (per pound increase per year) was associated with 11% increased risk of pancreatic cancer (1.11; 1.03-1.20) after adjusting for known lifestyle and behavioral risk factors. There was a significant interaction (p=0.03) between weight gain per year in adulthood and race/ethnicity, where Japanese Americans and Latinos experienced a 36% (1.36; 95% CI 1.14-1.64; p-trend<0.001) and 33% (1.33; 95% CI 1.11-1.59; p-trend=0.02) increased risk of pancreatic cancer per pound gained per year, respectively. Conclusion: Our findings indicate that weight gain in adulthood has a significant and independent impact on pancreatic cancer risk and specifically among racial/ethnic minorities. This study underscores the importance of maintaining a stable weight through adulthood, regardless of weight at age 21, in order to lower the risk of pancreatic cancer.

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C072 Maximum body mass index and breast cancer

incidence in Black women. Wambui G. Gathirua-Mwangi¹, Julie R. Palmer², Victoria Champion¹, Lucile L. Adams-Campbell³, Andrew Marley¹, Michele Forman⁴, Lynn Rosenberg², Kimberly A. Bertrand². ¹Indiana University, Indianapolis, IN, US, ²Boston University, Boston, MA, US, ³Georgetown Lombardi Cancer Center, Washington, DC, US, ⁴Purdue University, West Lafayette, IN, US.

Introduction: The prevalence of obesity is high in African American (AA) women. Excess weight is an established risk factor for postmenopausal breast cancer (and inversely associated with premenopausal breast cancer), but studies of recent body mass index (BMI) in AA women have shown relatively modest associations. The use of maximum BMI attained during adulthood, which is less likely to be influenced by recent illness, has been suggested as an alternative exposure metric and has yielded stronger associations for some outcomes. Whether maximum BMI attained during adulthood is associated with risk of breast cancer has not yet been evaluated. **Methods:** We evaluated associations of maximum BMI attained during follow-up with incidence of all breast cancer and with breast cancer subtypes in 56,919 AA women in the prospective Black Women's Health Study. From 1995 to 2013, we identified a total of 2708 breast cancers, of which 2008 were invasive cancers, including 1446 estrogen receptor (ER) positive and 652 ER negative. We used multivariable Cox proportional hazards regression to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for associations by ER status and menopausal status. **Results:** Compared to a maximum BMI of <25 kg/m², having a maximum BMI of ≥35 kg/m² (Obese II) was associated with increased risk of ER+ (HR=1.29, 95% CI 1.05-1.59) and postmenopausal breast cancer (HR=1.38, 95% CI 1.12-1.70), after adjustment for BMI at age 18 and other breast cancer risk factors. The association of maximum BMI with ER+ breast cancer was observed among postmenopausal women (HR=1.63, 95% CI 1.24-2.15) but not premenopausal women. The associations observed for maximum BMI were stronger in magnitude than associations for recent BMI in the same dataset. **Conclusion:** A maximum attained BMI of ≥35 kg/m² is associated with substantially increased risk of ER+ breast cancer among postmenopausal AA women. These findings provide new insights into the impact of obesity on breast cancer risk in this population, and suggest that maximum BMI may be a useful metric for understanding associations between adiposity and breast cancer risk.

C073 The association between 27-hydroxycholesterol metabolizing enzymes, CYP27A1 and CYP7B1, expression and mortality in a multiethnic U.S. population of breast cancer patients.

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Breast cancer is the most common cancer and the second leading cause of cancer death among women in the U.S. Obesity is one of the most significant risk factors for breast cancer in postmenopausal women and is a key predictor for poor prognosis. Postulated mechanisms underlying the association between obesity and post-menopausal breast cancer include higher levels of estradiol, hypercholesterolemia, and inflammation. 27-hydroxycholesterol (27HC) is produced when cholesterol is metabolized by the enzyme, sterol 27-hydroxylase (CYP27A1), a conversion that is reversed by the catabolizing enzyme, oxysterol 7 α -hydroxylase (CYP7B1). Laboratory studies established that 27HC is an endogenous selective estrogen receptor modulator (SERM) capable of promoting breast cancer growth by binding to the estrogen receptor (ER) and by increasing the metastatic potential of breast tumors through the activation of the liver X receptor (LXR). However, there are significant gaps in the understanding of 27HC's complex role in breast cancer pathobiology and breast cancer survival, particularly in multiethnic populations. We examined the association between protein expression profiles for CYP27A1 and CYP7B1 with breast cancer-specific and overall mortality in a multiethnic U.S. population by conducting immunohistochemical analyses, utilizing commercially available antibodies to CYP27A1 and CYP7B1, on a total of 787 invasive breast tumors included in a population-based tissue microarray. Based on Cox proportional hazards regression analysis with adjustment for age, stage, ER and progesterone receptor (PR) status, and first course treatment, we did not observe significant associations between expression of CYP27A1 or CYP7B1 and mortality across all cases. However, in subgroup analyses within major racial/ethnic groups (Caucasian, Japanese, and Native Hawaiian) we observed a significant negative association for CYP7B1 expression for both breast cancer-specific (HR=0.057, 95% CI: 0.012-0.264) and overall mortality (HR=0.119, 95% CI: 0.028-0.509) among Native Hawaiian women, but not among Caucasian or Japanese women. This is the first report to demonstrate racial/ethnic differences in the association between the levels of these cholesterol regulating enzymes in breast tumors and survival in a multiethnic population of breast cancer patients.

C074 Presence of crown-like structures in breast adipose tissue and clinical outcomes among African-American and White breast cancer patients.

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Background: Crown-like structures in breast adipose tissue (CLS-B), indicative of proinflammatory conditions, are most frequently observed among obese (body mass index, BMI ≥ 30 kg/m²) women and may contribute to poor prognosis in this group. African-American (AA) women have disproportionately higher rates of obesity than White women, and at least one prior study suggests the prevalence of CLS-B may be higher among AA women. However, most previous studies have examined CLS-B within affected tissues, which may reflect inflammation in the tumor microenvironment, and few have examined the association between CLS-B and clinical outcomes by race. Methods: We examined the presence of CLS-B detected by CD68 immunohistochemistry in normal adjacent breast tissue from a quadrant uninvolved by tumor obtained via mastectomy among 174 African-American women and 168 White women with stage I–III breast cancer diagnosed at Emory University Hospitals (2007–2012). We also investigated associations between CLS-B and other demographic and lifestyle factors at diagnosis (e.g., BMI, smoking status, age at menarche, parity, lactation, menopausal status, hormone replacement therapy use, and family history of breast cancer). Patients were followed for an average of seven years after diagnosis for recurrence and survival. Multivariable Cox proportional hazards models were used to compute hazard ratios (HR) and 95% confidence intervals (CI) for associations between CLS-B presence and progression-free survival (PFS), controlling for BMI and other potential confounders. Results: Median age at diagnosis for both AA and White women was 54 years, with more than 60% postmenopausal among both groups. AA women were more likely than White women to be obese (52% vs. 24%) and have ER- tumors (30% vs. 12%). Presence of any CLS-B was similar between AA (32%) and White (29%) patients. In multivariable models, we did not find any association between CLS-B and race (HR=1.14, 95% CI: 0.72, 1.82) with the only statistically significant factors being BMI (≥ 30 vs. 18.5- <25 kg/m²: HR=4.36, 95% CI: 2.17, 8.76) and parity (1+ vs. 0 births: HR=0.43, 95% CI: 0.21, 0.91). Over follow-up, 46 breast cancer recurrences and 52 deaths (23 from breast cancer) occurred. Overall, the presence of CLS-B was not associated with PFS (multivariable HR: 0.97,

95% CI: 0.58, 1.62). When examined by race, there was a difference in the direction of the association between CLS-B and PFS among AA women (HR=1.25, 95% CI: 0.64, 2.46) compared to White women (HR=0.75, 95% CI: 0.33, 1.71), although this difference was not statistically significant (P=0.86). Conclusion: Our results show a strong, positive association between BMI and CLS-B in non-tumor tissue and an inverse association with parity. We did not observe a difference in CLS-B presence by race nor did we find CLS-B to be associated with worse progression-free survival, which is in contrast to previous studies that have examined the presence of CLS-B within specimens in close proximity to the tumor.

C075 Association of obesity with breast cancer subtypes among non-Hispanic Black women.

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Although non-Hispanic White and non-Hispanic Black women have similar breast cancer incidence rates, Black women are more likely to be diagnosed with aggressive or late-stage disease and have higher mortality rates compared to White women. Clinical studies have demonstrated that tumors lacking estrogen receptor (ER), progesterone receptor (PR) and/or human epidermal growth factor receptor 2 (HER2) (referred to as “triple negative breast cancers” or TNBC), are associated with an aggressive pathology and poor prognosis and distinct risk factor profiles, compared to those with receptor positivity. Through the current study, we examined the effect of obesity in the development of breast cancer subtypes; specifically, ER- tumors and TNBC. To examine the association between body mass index (BMI) and breast cancer subtype, we utilized a pooled dataset of Black women with breast cancer from four studies: Black Women Etiology and Survival of Triple-negative Breast Cancers Study, Southern Community Cohort Study, Nashville Breast Health Study and the Tri-State Breast Study. For all four studies, information on tumor ER, PR and HER2 status was abstracted from state cancer registry records and supplemented by available pathology reports and medical records. We calculated BMI as kg/m², based on self-reported weight and height, and classified it as normal (18.5- <25), overweight (25- <30), obese I (30- <35), obese II (35- <40) and obese III (40+). Case-only logistic regression models were used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association between obesity and breast cancer subtype, using ER+ as the reference group for ER- and TNBC.

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Since the association between obesity and breast cancer has been shown to differ between pre- and postmenopausal women, all analyses were stratified by menopausal status at breast cancer diagnosis. Approximately 70% of the 2,801 women included in the study were postmenopausal at breast cancer diagnosis. Overall, 69% of the tumors were ER+, with similar proportions among pre- and post-menopausal women. In total, 25% were TNBC, of which a third were among pre-menopausal patients. In multivariable analyses, using premenopausal women with ER+ breast cancer as the reference group, those with ER- breast cancer (OR 2.16, 95% CI 1.20-3.88) or TNBC (OR 2.13, 95% CI 1.06-4.28) were more likely to be in the obese II category. Among postmenopausal women, there was no clear association between obesity and breast cancer subtype, although the obese class I category was non-significantly associated with lower risk of TNBC compared to ER+ subtype (OR 0.79, 95% CI 0.53-1.17). Our study represents one of the largest studies to assess the differential impact of obesity on breast cancer subtypes among Black women. Our findings suggest that higher BMI is associated with increased risk of TNBC for premenopausal women and demonstrates that premenopausal obese Black women are more likely to be diagnosed with ER- and TNBC compared with ER+ tumors.

C076 Effect of obesity and inflammation on prostate cancer disease risk and mortality among African and European American men. [Margaret S Pichardo](#)¹, Tsion Minas², Wei Tang², Tiffany Dorsey², Michael Cook², Stefan Amb². ¹Yale University, New Haven, CT, USA, ²National Cancer Institute, Bethesda, MD, USA.

Prostate cancer (PCa) is a major cause of cancer death in U.S. men. Age-adjusted mortality rates for men of African ancestry (40.8 per 100,000) are more than twice that of men of European ancestry (18.2 per 100,000). Men of African ancestry are more likely to have advanced stage cancer at diagnosis and lower prostate cancer survival rates relative to men of European ancestry of similar age and stage at diagnosis. Risk factors that may explain this survival disparity remain poorly understood. Obesity, a major risk factor for cancer development, aggressiveness and progression, disproportionately affects US men of African ancestry. Age-adjusted prevalence of obesity are higher among men of African ancestry (38.0%) compared to men of European ancestry (34.7%). While it has been previously suggested that obesity may worsen disease-related outcomes among prostate cancer patients, the relationship of obesity and prostate cancer mortality remains unclear, with studies showing mixed or null results in men of African ancestry.

Less is known about the underlying biological mechanisms that may contribute to the racial differences observed in the link between obesity and prostate cancer. We previously reported an obesity paradox among African-American men in the NCI-Maryland Prostate Cancer-Case Control Study, with overweight and obese men having a lower risk of being diagnosed with the disease. Here, using Cox proportional hazard regression modeling, we estimated the risk of a PCa mortality for the 976 cases in the study. Our primary analysis suggests an obesity paradox, where obesity may protect against disease mortality among the African-American men. In subsequent analyses, we will examine the role of immune and inflammation markers in mediating or moderating the observed relationship of obesity with PCa in these men.

C077 What do different modeling approaches tell us about the association between migration history and midlife body size and obesity in Latina women? [Carmen B Rodriguez](#), Shweta Athilat, Parisa Tehranifar. Columbia University Mailman School of Public Health, New York, NY, US.

General and central obesity, excess weight and body fat constitute potentially modifiable risk factors for several cancer sites and are important targets for cancer prevention efforts. The prevalence of obesity continues to increase in the United States (U.S.) and many parts of the world. In Latino populations, immigration to the U.S. and subsequent acculturation are accompanied by an increase in body size and obesity risk; however, evidence for Latinos of non-Mexican origin is limited. We examined the associations of birthplace, migration age, and percent of life in the U.S. with body size measures in a sample of 787 self-identified Latina women of predominantly Caribbean heritage (79% born in the Dominican Republic or Puerto Rico), recruited from a mammography clinic in New York City (ages 40-65 years, 53% monolingual Spanish speakers, 31% immigrated to the U.S. before age 20). We collected in-person interview data and measured women's height, weight and waist circumference, which were used both as continuous and categorical variables to assess general obesity/body size using BMI (kg/m², general obesity ≥ 30 vs. < 30) and central body fat composition/central obesity using waist circumference (in cm, ≥ 88 vs. < 88). We conducted multivariable regression analysis using linear regression and quantile regression methods for continuous body size measures and relative risk regression for risk of obesity. The results of linear and relative risk regression models showed lower BMI and waist circumference as well as lower risk of general and central obesity associated with foreign birthplace, later age at migration and less time in the U.S.

Results from quantile regression revealed differences by percentiles with statistically significant inverse associations that were limited to the upper quantiles (\geq 75th percentile) of BMI and waist circumference. For instance, as compared with U.S.-born Latina women, BMI was lower for women who had spent $<$ 50 % of life in the U.S., migrated to the U.S. at ages \geq 30 years and were born in the Dominican Republic at the 75th percentile of BMI ($\beta = -4.10$, 95% CI: -6.75, -0.81; $\beta = -4.34$, 95% CI: -7.07, -0.88 ; $\beta = -3.72$, 95% CI: -6.41, -0.43, respectively), but no BMI differences by migration history were observed at the 25th percentile of BMI ($\beta = 0.04$, 95% CI: -1.01, 0.96; $\beta = 0.04$, 95% CI: -0.87, 1.08 ; $\beta = 0.08$, 95% CI: -0.94, 1.14, respectively). In conclusion, our results using different modeling approaches provide support that migration to the U.S. is associated with larger body size and risk of obesity in midlife Latina women from Caribbean heritage, as observed for other Latina subgroups. Through the use of quantile regression methods, we provide new data highlighting that migration influences on body size may be stronger and most consistent at the higher distribution of BMI and waist circumference.

C078 Racial/ethnic disparities in breast cancer survival by subtypes: The role of obesity. Carola T Sánchez Díaz, Garth H Rauscher. University of Illinois at Chicago, Chicago, IL, USA.

Background: Previous studies have established a strong association of higher body mass index (BMI) with increased risk of postmenopausal breast cancer (BC) but with decreased risk for premenopausal BC. Additionally, a handful of studies have found higher BMI at diagnosis to be associated with increased mortality for both ER positive and negative BC subtypes, but associations have been inconsistent. We re-examined associations of BMI with tumor subtypes and BC-specific death, and whether the disproportionate prevalence of obesity in non-Hispanic (nH) black women mediated racial disparities in survival. Methods: We included 6884 breast cancer cases from the MCBCR from 2001-2014. Continuous BMI was categorized as under/normal weight ($10 < \text{bmi} < \text{bmi} < 35$). We ran age and race adjusted logistic regression models for associations of BMI as a nominal categorical variable with ER subtype overall and by menopausal status. We then modeled the hazard of BC death in Cox proportional hazard regression against race/ethnicity (nH Black versus nH White) while adjusting for age at diagnosis, before and after including BMI in our models. Survival analysis models were stratified on menopausal status and ER subtype. All analyses were conducted using STATA, v.15 (Stata Corp LLC, College Station, Texas). Results: nH Black women were less likely to be normal weight (8% vs.

15%) and more likely to be overweight (17% vs. 11%) compared to nH Whites, but there was no disparity in morbid obesity in this sample (50% vs. 50%). Higher BMI was not associated with prevalence of ER subtypes. Morbid obesity was associated with BC-specific death for both pre-menopausal (HR=3.55, 95% CI: 1.62, 7.79) and postmenopausal women (HR=2.02, 95% CI: 1.30, 3.17) and for both ER positive (HR=2.58, 95%CI: 1.55, 4.31) and negative tumor subtypes (HR=0.73, 95%CI: 0.93, 3.23). There was no evidence that BMI mediated BC survival disparities in any of the strata defined by menopausal status or ER subtype. However, the association of morbid obesity with BC death was much stronger for nH White (HR=3.81, 95%CI: 2.67, 5.44) than nH Black patients (HR=1.51, 95%CI: 0.98, 2.33). Among ER positive BC patients, the association of morbid obesity with BC death was even stronger for nH White patients (HR=4.54, 95%CI: 2.81, 7.32) but disappeared among nH Black patients (HR=1.10, 95%CI: 0.63, 1.93). Conclusions: In this clinical population, morbid obesity (defined here as a BMI $>$ 35) is very prevalent (50%) and it has negative implications for survival from a BC diagnosis regardless of menopausal status or subtype. Contrary to our expectation, the association of morbid obesity with BC death was considerably larger for nH White than for nH Black patients. Patients who are morbidly obese should be targeted for more detailed follow-up to improve our understanding of the mechanisms involved in the role of morbid obesity in BC death and how these mechanisms may differ for by race. </bmi

C079 The association between metabolic syndrome and five common types of cancer differs by gender and race/ethnicity: Evidence from the National Health and Nutrition Examination Survey. Lin Zhu¹, Wenyue Lu¹, Mark Weiner¹, Konstantinos Krampis², Grace X Ma¹. ¹Center for Asian Health, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, USA, ²Department of Biological Sciences, Hunter College, City University of New York, New York, NY, USA.

The higher cancer burden in racial/ethnic minority populations reflects a complex interplay between biological, behavioral, and cultural factors. Increasing evidence suggests that metabolic syndrome (MetS) may be an important etiologic factor to several common types of cancer. MetS is a disease entity characterized by a constellation of interconnected physiological, biochemical, clinical, and metabolic factors that increase the risk of cardiovascular atherosclerotic diseases and diabetes mellitus type 2. We used data from the 2011–2016 National Health and Nutrition Examination Survey (NHANES) to define a case-control sample, which then helped us to examine the racial/ethnic

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disparities in the association of MetS and five common types of cancer (liver, breast, prostate, colorectal, and stomach), as well as overall cancer prevalence. We used chi-square tests and binary logistic regressions to examine the MetS and cancer association, by gender and cancer site separately for each racial/ethnic group (non-Hispanic white (NHW), non-Hispanic black, (NHB), Hispanics, and Asian). We then computed relative risks of the presence of MetS to any cancers and each of the five types of cancer. All analyses were conducted in Stata 14. From a total sample of 17,969 cases, we identified 15,463 no-cancer cases, and 1,584 cancer cases. Specifically, there are 12 liver cancer cases, 254 breast cancer cases, 254 prostate cancer cases, 16 stomach cancer cases, and 112 colorectal cancer cases. MetS was significantly associated with overall cancer prevalence among (NHW) men and women, and marginally associated among NHB women. Furthermore, NHB women with MetS had a higher rate of breast cancer than those without. Similar, yet less significant, findings were found in NHW women with respect to colorectal cancer. Finally, there was a significant risk of MetS presence for any type of cancer, overall and in NHW, NHB, and Hispanics. Overall, we found a nuanced association between MetS and cancer that varied by gender, race/ethnicity, and cancer type. Limitations in analyses were due to small sample sizes and low cancer counts in three minority groups. The next steps of our research are to (1) conduct analysis in larger samples; (2) explore the etiological and epidemiological mechanisms of MetS-cancer association; and (3) design and implement integrative behavioral interventions among high-risk groups. The findings contribute significantly to our understanding of the epidemiology and etiology of MetS and cancer and form the basis for future research and public health interventions. Acknowledgement: This project was supported by TUFCCC/HC Regional Comprehensive Cancer Health Disparity Partnership, Award Number U54 CA221704(5) (Contact PIs: Grace X. Ma, PhD and Olorunseun O. Ogunwobi, MD, PhD) from the National Cancer Institute of National Institutes of Health (NCI/NIH). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NCI/NIH.

C080 A successful culturally tailored intervention to empower low-income Asian American women to conduct human papillomavirus self-sampling test.

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USA, ⁴Case Comprehensive Cancer Center, Case Western Reserve University, Cleveland, OH, USA, ⁵Department of Behavioral and Community Health, University of Maryland, College Park, MD, USA.

Background: Asian American women face disproportionate burden of cervical cancer (CC) than do non-Hispanic white women in the United States. Human papillomavirus (HPV) screening rates are still relative low among first-generation immigrant women and those with low socioeconomic status. Self-sampling for HPV is a convenient and cost-effective way to increase screening, especially among the low-income and underserved populations. This study aims to assess the impact of a culturally-tailored intervention to promote HPV self-sampling among low-income Asian American women. Methods: We adopted the community-based participatory research (CBPR) approach to conduct this efficacy study. A total of 156 female participants from three ethnic groups, Chinese (56), Korean (50), and Vietnamese (50) were recruited from community-based organizations (CBOs) such as churches and community centers in the greater Philadelphia metropolitan area. All participants received educations on HPV symptoms, transmissions, and screening, through workshops and group discussions at the CBOs. The workshops included handouts, lectures, and a demonstration on conducting a self-sampling HPV test in Chinese, Korean, and Vietnamese languages. Participants were also given self-sampling kits and were contacted 30 days post intervention (booster contact). Results: The majority of the sample was Asian American women with low annual household income (62.3% earned less than \$20,000) and low educational attainment (61.3% without a college degree). We used paired sample t-tests to assess the differences between baseline and post-intervention for knowledge, social support, self-efficacy, and comfortability conducting a HPV self-sample test. We found significant increase in participants' knowledge on HPV (baseline: 2.83, post: 4.89, $p < 0.001$), social support (baseline: 3.91, post: 4.09, $p < 0.001$), self-efficacy (baseline: 3.05, post: 3.59, $p < 0.001$), and comfortability conducting a HPV self-sample test (baseline: 3.62, post: 4.06, $p < 0.001$). Within 6 months post intervention, all (100%) participants completed the HPV self-sampling test and returned the kits, which were then sent to the lab for analysis. Conclusion: To the best of our knowledge, this is the first intervention to promoted HPV self-sampling among Asian American women. Our findings showed that culturally tailored messages and hands-on demonstrations of the self-sampling kits were highly effective in empowering low-income Asian immigrant women to conduct HPV self-sampling tests. Acknowledgement This study is partially supported by the faculty research funds under the Center for Asian Health, Temple University (PI:

Grace X. Ma, PhD). It is also partially supported by the grant of U54 CA221704(5) funded by the National Cancer Institute (NCI) of NIH (Contact PIs: Grace X. Ma, PhD and Olorunseun O. Ogunwobi, MD, PhD). The contents of this abstract are solely the responsibility of the authors and do not necessarily represent the official views of NIMHD or the NCI, NIH.

C081 Introduction of a randomized controlled trial on areca nut/betel quid cessation: The Betel Nut Intervention Trial (BENIT).

(BENIT). [Yvette C Paulino](#)¹, Lynne R Wilkens², Patrick P Sotto¹, Adrian A Franke², Crissy T Kawamoto², Jade SN Chennaux¹, Ana J Mendez¹, Lynette F Tenorio¹, Grazyna Badowski¹, Pallav Pokhrel², Thaddeus A Herzog². ¹University of Guam, Mangilao, Guam, USA, ²University of Hawaii Cancer Center, Honolulu, HI, USA.

Areca nut, the seed of the *Areca catechu* L. palm evaluated to be a Group 1 carcinogen, is still chewed by 10-20% of the world population. It is often chewed with *Piper betle* L. leaf and other ingredients such as slaked lime and tobacco, to form a betel quid. Globally, areca nut/betel quid is the fourth most commonly used psychoactive substance after tobacco, alcohol, and caffeine. Unlike tobacco cessation, systematic research on areca nut/betel quid cessation is rare. The negative health effects associated with areca nut/betel quid consumption warrant the need for an evidence-based cessation program. Consequently, the Betel Nut Intervention Trial (BENIT) was initiated in August 2016. The BENIT is a randomized, controlled, superiority trial designed to test the efficacy of an intensive areca nut/betel quid cessation program, and to quantify the efficacy through bio-verification. The trial is ongoing in Guam and Saipan in the Mariana Islands. Adult areca nut/betel quid chewers, 18 years and older who include tobacco in their betel quid, are being enrolled into the trial. Those enrolled are assessed for the primary outcome (chewing status) and the secondary outcome (saliva bio-verification) at baseline, at 22 days, and at 6 months. The areca nut/betel quid chewers randomized into the control arm receive an educational booklet only. The areca nut/betel quid chewers randomized into the intervention arm receive the educational booklet and a 22-day cessation program modeled after a smoking cessation program and led by trained facilitators. To date, 224 chewers have been enrolled into the BENIT. The current quit percentages are 18% in the experimental group and 8% in the control group, though these results may change as the trial progresses. The BENIT is designed to provide evidence of the efficacy of a cessation program to help areca nut/betel quid with tobacco chewers to quit chewing. Although the current intervention trial focuses on Guam and Saipan, it has the potential for greater regional and global importance. TRIAL REGISTRATION: Clinical Trial # NCT02942745.

C082 The association between breast density and cellular proliferation in obese/overweight Hispanic premenopausal women with features of metabolic syndrome. [Jesse S. Trujillo](#),

Edgar Tapia, Pavani Chalasani, Jean-Phillipe Galons, Sara Centuori, Denise J. Roe, Jose-Guillen Rodriguez, Cynthia Thompson, Maria Altbach, Jessica Martinez, Amit Algotar, H-H. Sherry Chow. University of Arizona, Tucson, Arizona, United States.

Background: Ki-67, a proliferative biomarker, is a well-recognized breast cancer risk factor. In addition to this, breast density is also a well-known risk factor for breast cancer. Currently, there is contradictory disputes between the association of breast density and cellular proliferation. Determining the association between these two risk factors is an important part of breast cancer prevention and health disparity research. Problem: There is presently very little data available that show the relationship between breast density and markers of proliferation, especially among overweight/obese premenopausal Hispanic women with metabolic syndrome. We have the unique opportunity to study these associations in our patient population, which consists of 30 percent Hispanic women. This distinctive characteristic will allow us to determine the association between breast density and Ki-67 in a population that is underrepresented and characteristic with the population of Southwest Arizona. Methods: Included in our study were (n=151) overweight/obese premenopausal women enrolled from a Phase II clinical trial that we are conducting at the University of Arizona. For our Hispanic participants (n=45) and non-Hispanic participants (n=67), we collected measurements of breast density using a fully-automated Fat-Water MRI imaging method. These density images were gathered at baseline, 6 months, and 12 months. Out participants had an optional biopsy taken at baseline and 6 months. These biopsies were immunohistochemically stained for Ki-67, and quantitatively measured with the Definiens Tissue Studio. Conclusions: Given the limited amount of association studies between breast density and markers of proliferation in overweight/obese premenopausal Hispanic women with characteristics of metabolic syndrome, these two markers should be recognized as complimentary to one another. Additionally, our study will be among the first to determine this association and applied to underrepresented minority populations across the United States.

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C083 Consumption of lifestyle-associated advanced glycation end products promotes prostate tumor growth by creating a tumor-enhancing stromal microenvironment.

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Our research has demonstrated that advanced glycation end products (AGEs) derived from the diet can directly impact neoplastic growth by creating a tumor-enhancing micro-environment. Most people are unaware of what AGEs are or the damage they can cause, but we are exposed to them every day through the lives we lead and the foods that we eat. The Western diet together with more sedentary habits means that lifestyle-associated AGEs are accumulating in our bodies at a faster rate than ever before. Changes in the AGE equilibrium due to lifestyle cause protein dysfunction, reduced genetic fidelity, and aberrant cell signaling activation which we believe contribute to cancer disparity outcomes. Disparity populations defined by AGE-associated risk factors such as diet, smoking, drinking and physical inactivity often bear a greater cancer burden when compared to the general population (reviewed by the PI, Cancer Research 2015). Lifestyle associated AGEs therefore may represent a unifying biological consequence of the social, demographic and environmental risk factors that contribute to the increased cancer incidence and mortality associated with cancer disparity. An important discovery from our work is that consumption of a diet high in AGEs accelerates prostate tumor growth in syngeneic xenograft prostate cancer (PCa) models as well as disease progression in spontaneous PCa models. Critically, dietary-AGE mediated effects on prostate tumor growth were dependent upon the stromal activation of RAGE. An activated stroma is a critical pathway impacting prostate cancer outcomes in African American men. Our studies show that dietary-AGE alters cytokine profiles, increases the activation of cancer associated fibroblasts (CAFs) and increases immune cell recruitment to the tumor microenvironment. Tumor associated immune cells adopt distinct metabolic patterns which function to maintain the energy requirements needed for cell differentiation and functionality. Pathway analysis of expression data from excised tumors shows that AGE consumption significantly impacts energy metabolism through the aberrant expression of MYC regulated transcriptional targets. Our studies also show that AGEs are highest in African American men with prostate cancer. Dietary-AGE mediated activation of tumor stroma therefore may align with the ancestry specific stromal and immune profiles observed in African American men

with prostate cancer. Due to their links with lifestyle, both pharmacological and/or interventional strategies aimed at reducing the AGE accumulation pool may be viewed as universal cancer preventive and/or therapeutic initiatives. This may be an attractive option for populations where lifestyle change is not feasible due to poverty, inability, illness, treatment side effects, time, apathy and depression.

C084 Geographic variation in human papillomavirus (HPV) vaccination initiation and completion among adults in the United States.

[Eric Adjei Boakye](#)¹, Maggie Wang², Wiley D Jenkins¹, Nosayaba Osazuwa-Peters², Oluwole Babatunde³, Min Jee Lee¹, Minjin Kim⁴. ¹Southern Illinois University School of Medicine, Springfield, IL, USA, ²Saint Louis University School of Medicine, St. Louis, MO, USA, ³University of South Carolina, Columbia, SC, USA, ⁴University of Massachusetts Medical School, Worcester, MA, USA.

Background: Approximately 43,000 human papillomavirus (HPV)-associated cancers and 350,000 genital warts are diagnosed annually in the United States. The HPV vaccine can prevent HPV-associated cancers and genital warts. The Advisory Committee on Immunization Practices recommends routine HPV vaccination for adolescents between 11 and 12 years of age, and catch-up vaccination up to 45 years recently. Despite the availability, safety, and efficacy of HPV vaccines, uptake has been suboptimal compared to other routine vaccinations in adolescents, and even worse for adults in the catch-up group. As little is known about geographic variation in HPV vaccine uptake among adults, we explored how HPV vaccine initiation and completion rates among 18–34 year olds (both men and women) varies by geographic region. **Methods:** We analyzed data from 16 states (Alabama, Arkansas, Connecticut, Georgia, Hawaii, Massachusetts, Mississippi, Missouri, New Hampshire, Nebraska, North Carolina, South Carolina, South Dakota, Tennessee, Texas, and West Virginia) which conducted the adult HPV module survey during 2015–2017 Behavioral Risk Factor Surveillance System. Two variables were used to define geographic region: census region (South, Northeast and Midwest/west) and residential area (urban and rural). HPV vaccine initiation was defined as receipt of at least one dose of the vaccine and completion as receipt of three doses. Weighted, multivariable binary logistic regression models were used to assess the association between geographic region and HPV vaccine uptake, adjusting for demographic, socioeconomic, and healthcare utilization factors. **Results:** A total of 18,078 adults were included in the study, of whom 80% resided in the South. The overall HPV initiation and completion rates were 23.4% and 11.0%, respectively. Vaccine initiation was higher among those

who resided in the Northeast (38.6%) followed by Midwest/west (23.8%) and lowest for those in the South (21.8%). But initiation rates was similar between those who reside in urban (24.1%) and rural (21.0%) areas. Completion rates followed the same trend as initiation for both census region and residential area. In the adjusted models, compared to adults residing in the South, those living in the Northeast were more likely to initiate (adjusted odds ratio: 2.14; 95 % CI: 1.81–2.53) and complete (1.80; 1.47–2.20) the HPV vaccine. There were no significant differences observed for initiation or completion by residential area. **Conclusions:** Both the South and the Northeast have low HPV vaccination initiation and completion rates compare to the Healthy People 2020 goal of 80%, but vaccine uptake were significantly lower in the South region. No difference in HPV vaccine uptake was observed between the rural and urban areas. This demonstrates the need to develop and implement interventions programs to reduce geographical disparities in HPV vaccine uptake and ultimately to improve HPV vaccine uptake, especially in the South region.

C085 Neighborhood built environment was significantly associated with colorectal cancer screening among underserved Vietnamese American adults. [Aisha Bhimla](#)¹,

Cecily Johnson², Phuong Do¹, Minsun Lee¹, Grace X Ma¹. ¹Center for Asian Health, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, USA, ²Hunter College Center for Cancer Health Disparities Research, Hunter College of The City University of New York, New York, NY, USA.

Introduction: Colorectal Cancer (CRC) places a significant burden among Asian Americans, and prevailing as the second most common cancer diagnosis and third leading cause of cancer mortality. Vietnamese Americans represent an Asian American subgroup with many being foreign-born, having limited English proficiency, living in economically disadvantaged neighborhoods and reporting substantially low levels of CRC screening. The built environment that surrounds where individuals reside impacts health outcomes and behaviors, including cancer risk factors and morbidity. The purpose of the study was to determine whether neighborhood walkability and transit accessibility were associated with CRC screening among underserved Vietnamese Americans. Methods: Vietnamese American adults aged 50 and older enrolled in a multilevel CRC screening intervention were recruited from 20 community-based organizations in the Greater Philadelphia and Southern New Jersey regions. A total of 804 cross-sectional baseline surveys were collected from participants to determine their screening behavior, including past colonoscopy and fecal

immunochemical test (FIT) screenings. Built environmental factors were measured using the Walk Score™ and Transit Score™. Results: Multiple logistic regression analyses illustrated that a one unit increase in Transit Score⁰ was associated with an 2.6% higher odds of obtaining a colonoscopy (OR 1.026, 95% CI 1.001-1.051, p=0.039) and 7% higher odds of obtaining a FIT (OR 1.069, 95% CI 1.025-1.116, p=0.002) after controlling for covariates including age, gender, marital status, education level health insurance status, having a primary care physician and English fluency. Neighborhood walkability measured by the Walk Score was not significantly associated with having obtained a colonoscopy or FIT. Discussion: This study elucidates the impact of the built environment on CRC screening and accessibility of services among Vietnamese Americans. Future assessment and intervention studies should address and incorporate built environmental components to address CRC risk behaviors and screening among potentially underserved populations. Keywords: built environment; colorectal cancer screening; Vietnamese Americans
Acknowledgement This research project was supported by grant U01MD010627 (PI: Grace X. Ma, PhD) funded by National Institute on Minority Health and Health Disparities (NIMHD) of National Institute of Health (NIH), and partially supported by the grant of U54 CA221704(5) funded by the National Cancer Institute (NCI) of NIH (Contact PIs: Grace X. Ma, PhD and Olorunseun O. Ogunwobi, MD, PhD). The contents of this abstract are solely the responsibility of the authors and do not necessarily represent the official views of NIMHD or the NCI, NIH.

C086 The effect of length of residence in the US on risk of developing chronic disease in West African male immigrants. [Adaora Ezeani](#)¹,

Ernest Kaninjing², Folakemi Odedina¹, Catherine Badejo¹, Anthonia Sowunmi¹, Omolara Fatiregun¹, Ayo Salako¹, A. A. Popoola¹, Mohammed Faruk¹, Emeka Iweala¹, Iya Bassey¹, Chidiebere Ogo¹, O. P. Oluwole¹, H. A. Nggada¹, Paul Jibrin¹, Oluwole Kukoyi¹, Ifeoma Okoye¹, Abidemi Omonisi¹, Iheanyi Okpala¹, Lasebikan Nwamaka¹, A. Adeniji¹, Nissa Askins¹, Ruth Agaba¹, Oluwaseyi Adeniji¹. ¹University of Florida, Orlando, FL, USA, ²Georgia College and State University, Milledgeville, GA, USA.

Background African immigrants represent one of the fastest growing groups of immigrants in the US, resulting in increased diversity of Blacks in the US. Therefore, there is a growing need to assess the healthcare needs and practices of this population. The main public health concern has been on infectious disease but priority should also focus on chronic disease. Specifically, the literature has yet to provide

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consistent results regarding the “healthy immigrant effect”, specifically that immigrants are in relatively better health on arrival before their health converges with native-born levels after time. Using the data collected by the Prostate Cancer Transatlantic Consortium (CaPTC), this study explores chronic disease history and healthy behaviors of male immigrants from West Africa with length of residence in the US. Methods A study questionnaire was used to collect data on West African (WA) Black men residing in Nigeria, Cameroon, and the United States. Data from 709 respondents, Black men between the ages of 35-70 years, recruited from community settings, was collected. Variables analyzed included age, education level, income, smoking and alcohol use, weight, height, physical activity levels, country of birth, country of residence, years since immigration, chronic disease history, and health insurance status. Descriptive analysis was used to determine the frequency of each condition among participants. Results There were 37 respondents, WA males, residing in the US; 26 born in Cameroon, 10 born in Nigeria, 1 born in Sierra Leone, 1 born in Ghana. The average age was 46.2 years and the average length of residency was 13.9 years. Participants were placed in two groups: length of residence in the US of less than or equal to 10 years (LT10Y) and greater than 10 years (GT10Y). This study focused on the most common chronic diseases in the US: high blood pressure (HB), high cholesterol (HC), diabetes (D), stroke/transient ischemic attack (ST), COPD, Alzheimer’s (AZ), and arthritis (AT). Although there was no statistical significant differences between participants who lived greater than 10 years in the US compared to those who resided 10 years or less, there was practical differences. For example, 39% in the LT10Y group had been diagnosed with HBP versus 42% in the GT10Y group. With larger sample size, it is likely that there may be statistical differences. There was statistical significant differences in HC diagnosis with 5% in LT10Y and 22.2% in GT10Y. The GT10Y group showed decreased alcohol use, increased frequency of physical activity, and frequent annual physician visits and had higher income and education level. Conclusion Based on our results, we found length of stay of WA Black males in the US to impact HC diagnosis, alcohol use, physical activity, and physician visits. The “healthy immigrant” phenomenon is likely to be moderated by several factors and need to be studied more among African immigrants

C087 The relationship between alcohol, physical activity, and obesity in Mexican-origin adults. [Natalia I Heredia](#), Qiong Dong, Shine Chang, Lorna H McNeill. The University of Texas MD Anderson Cancer Center, Houston, TX, USA.

Background. Alcohol intake, lack of physical activity (PA), and obesity are risk factors for liver cancer. Although studies indicate that PA and alcohol intake are positively associated with one another, this relationship is less studied in Hispanics, who have the highest rates of liver cancer in the U.S. Furthermore, the relationship between alcohol intake and obesity is nuanced, with current drinkers having lower risk of obesity than never drinkers. The first aim of this study was to assess the relationship between alcohol intake and PA in Hispanic adults; secondary aims were to assess the effects of PA and alcohol on body mass index (BMI) and assess differences by gender and country of birth. Methods. We used data from the Mano a Mano Cohort, a cohort of Mexican-origin individuals living in the greater Houston area, for individuals recruited since 2012. Data included self-reported PA, alcohol intake (never, former, and current drinker), and demographic characteristics; trained field staff measured BMI. PA was categorized as high (≥ 1500 MET minutes/week), moderate (≥ 600 MET minutes/week) or low. We used logistic regression to assess the association between PA and alcohol intake with BMI, including an interaction term. Results. This sample ($n=3,899$) had an average age of 49, were mostly women, and had not attained a high school degree. Most were obese (60%) and never drinkers (67%). Never drinkers had more individuals with low (42%) than moderate (32%) or high levels of PA (26%). Current drinkers had more individuals achieving high PA (32%) than either never (26%) or former drinkers (24%). Obese, compared to non-obese, individuals did less PA and had a greater proportion of never drinkers. High PA was protective against obesity in the full sample (Adjusted Odds Ratio [AOR]=0.81, 95%CI: 0.68-0.95, $p<.05$), in females (AOR=0.73, 95%CI: 0.60-0.89, $p<.01$), and in Mexican-born individuals (AOR=0.79, 95%CI: 0.66-0.95, $p<.05$). Current drinking was protective against obesity in Mexican-born individuals (AOR=0.77, 95%CI: 0.61-0.97, $p<.05$), and was associated with significantly lower BMI in the full sample, males, and Mexican-born individuals. Among never drinkers, compared to those with low PA, those with high PA were significantly less likely to be obese (AOR=0.79, 95%CI: 0.65-0.96, $p<.05$). The only significant interaction between PA and alcohol use was in male never drinkers; as compared to those with low PA, those with high PA had significantly higher BMI (Beta=2.67, 95%CI: 1.02-4.32, $p<.01$). Conclusions. In this study of Mexican-origin adults, both high PA and current drinking were independently protective against obesity. However, for the full sample and most sub-groups, never drinkers with high PA were the only group significantly protected against obesity. The difference in the independent and interaction results illustrates the importance of evaluating multiple risk behaviors together to inform liver cancer prevention efforts in Mexican-origin adults.

C088 The importance of the social environment in achieving high levels of physical activity and fruit and vegetable intake in an African American cohort. [Natalia I Heredia](#),

Nga Nguyen, Lorna H McNeill. The University of Texas MD Anderson Cancer Center, Houston, TX, USA.

Introduction. As compared to all other racial/ethnic groups in the U.S., African Americans experience the highest incidence and/or mortality of several cancers, including colorectal, breast, prostate, and endometrial cancer. High levels of physical activity (PA) and fruit and vegetable (FV) intake are known to decrease risk for several of these cancers. However, only a small subset of African Americans successfully perform both of these cancer prevention behaviors. The purpose of this study is to assess which individual, social and neighborhood variables are associated with African American adults successfully performing both PA and FV intake. Methods. This is a cross-sectional analysis of African American adults recruited from Black churches in the greater Houston area. Self-administered questionnaires collected various self-reported variables as well as PA and FV intake. We created a combined 4-category behavioral outcome: high PA/high FV, low PA/ high FV, high PA/low FV, and low PA/low FV. We conducted both standard and stepwise multinomial logistic regression to examine the association between individual, social, neighborhood-level variables and the 4-category outcome. Results. This sample of African American adults (n=1009) had a mean age of 49 years, and was mostly female, and obese. As compared to the low PA/low FV intake group, the high PA/high FV intake had statistically significant lower odds of various individual-level variables (worrying about getting cancer, perceived stress, loneliness, financial strain) and higher odds of various social-level variables (social status, social cohesion, social organizations, and social norms). Interestingly, in stepwise multinomial logistic regression models where we entered all potential predictors into the stepwise selection process, controlling for sex, education, and employment status, the final model showed only variables on the social level remained significant. More specifically, perceiving oneself to have higher social status in the community (OR=1.14, 95%CI 1.01-1.29, p=.031), participating in more social organizations (Adjusted OR=1.60, 95%CI 1.24-2.06, p=.0003), social norms for FV intake (Adjusted OR=2.03, 95%CI 1.26, 3.29, p=.004), and social norms for PA (Adjusted OR=2.80, 95%CI 1.33, 5.89, p=.007) remained significantly associated with higher odds of high PA/ high FV intake. Discussion. These findings indicate that social influences may be most critical for high PA and FV intake in African American adults. Interventions focused on various social-level variables may be key to promoting these two cancer prevention behaviors in African American communities.

C089 Awareness of nonalcoholic fatty liver disease among Latino participants of community-based health screening. [Shehnaz Hussain](#), Jane Figueiredo, Zulfikarali Surani. Cedars-Sinai Medical Center, Los Angeles, CA, USA.

Introduction: Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease affecting 25% of Americans, and it is now the dominant cause of hepatocellular carcinoma (HCC). NAFLD prevalence is highest in Latinos (45%) and can climb as high as 70% among individuals with metabolic risk factors, such as diabetes and overweight/obesity. Little is known about the awareness and perceptions of the disease among Latino individuals at high risk. Methods: The goal of our study was to assess awareness of NAFLD as a disease entity among Latino individuals with and without metabolic risk factors in the community setting. We recruited participants who were constituents of faith-based organizations in the Los Angeles catchment area, which contains 9% of the nation's Latino population. A self-administered 37-item paper questionnaire was collected from Latino adults from January to June 2019, available in Spanish and English. Results: The study population (n=195) was composed primarily of women (87% female, mean age of 45 years), and 35% had less than a high school education. Overall, 82% of participants had at least one known metabolic risk factor including overweight/obesity (77%), diabetes (25%), or high blood pressure (18%). Only 3% had received a prior diagnosis of NAFLD. Nearly half (47%) of participants were not aware of NAFLD, and the percentages were similar among participants with self-reported major risk factors of overweight/obesity, diabetes, or high blood pressure. Among participants who were aware of NAFLD, nearly all (96%) believe that it can cause a serious health problem, and the majority believe that it can be prevented (93%). Also, 57% of participants who were aware of NAFLD believe that they are at risk, and most (80%) were willing to undergo screening for NAFLD with either imaging or a blood test. The majority of participants believe that obesity (80%) and lack of exercise (78%) predispose to NAFLD, although a common misconception among participants was that NAFLD can be treated (53%). In logistic regression models, NAFLD awareness was associated with increasing level of education (P=0.046), and belief that one is at risk of NAFLD was positively associated with BMI (P=0.014). Conclusion: Within this high-risk population of Latinos, many of whom have at least one metabolic risk factor, a high percentage were unaware of NAFLD and many had misconceptions regarding risk factors and treatment options, suggesting that important knowledge gaps exist. NAFLD is a preventable liver disorder with limited treatment options, thus increasing awareness and knowledge may be key for early prevention strategies.

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C090 Community-based screening for nonalcoholic fatty liver disease with transient elastography in Latinos without overt liver disease at high risk of hepatocellular carcinoma. [Shehnaz Hussain](#)¹, Jihane Benhammou². ¹Cedars-Sinai Medical Center, Los Angeles, CA, USA, ²University of California, Los Angeles, Los Angeles, CA, USA.

Introduction: Non-alcoholic fatty liver disease (NAFLD) is a disease spectrum that progresses through stages of liver fibrosis, cirrhosis, and ultimately hepatocellular carcinoma (HCC). NAFLD has more than doubled in incidence over the last decade alongside the obesity pandemic, and Latinos are at least twice as likely to be affected. The key clinical challenge is how to efficiently screen high-risk communities to identify individuals with severe steatosis and advanced fibrosis or cirrhosis who would benefit from lifestyle modifications, therapeutics, or cancer surveillance. A high proportion of patients with NAFLD are asymptomatic for long periods of time with normal laboratory tests, thus non-invasive procedures for early identification are needed. Transient elastography (TE) is a validated non-invasive diagnostic tool which can identify patients with liver disease. Methods: From March-June 2019, we recruited 76 Latino participants attending a community health screening event in Los Angeles to determine the prevalence of undiagnosed liver disease. We utilized TE performed with a FibroScan® (Echosens) to produce liver stiffness measurement (LSM, a measure of fibrosis in kPa) and a controlled attenuation parameter (CAP, a measure of steatosis in dB/m) on fasting participants, and we collected a self-administered questionnaire for basic characteristics and past medical history, offered in Spanish or English. Results: A total of 74 participants had a valid test with a minimum of ten LSMs with an interquartile range/median value less than 0.3. The mean age of participants was 50 years, and 65% were female. For metabolic risk factors, 78% were overweight or obese, with a mean BMI of 29.5 kg/m², and the percentage of participants with diabetes or high blood pressure was 29% and 15%, respectively. A minority of participants (4%) reported drinking alcohol 2-3 times per week or more. As for prior liver disease, 16% of participants reported a prior diagnosis of chronic liver disease: NAFLD (N=11), hepatitis B virus (N=1), or cholestatic disease (N=1). In subsequent analyses, we excluded participants with known liver disease. The TE data generated show that steatosis was present in 66% of participants (4% mild, 13% moderate, 49% severe steatosis), with a mean CAP of 273.9 dB/m. The mean LSM in this population was 5.8 kPa, with 22% of participants having kPa measure equivalent to a moderate fibrosis grade (F2 or greater). In univariate analyses, LSM was positively associated with BMI (P= 0.008) and CAP (P<0.001); CAP was

positive associated with age (P=0.004) and BMI (P<0.001). In multiple linear regression, CAP (P=0.015), but not BMI, was significantly associated with LSM; and BMI (P<0.001) and age (P<0.002) were both significantly associated with CAP. Conclusion: This study demonstrates the feasibility of using TE at a community-based health screening in a high-risk population. We detected a high rate of clinically significant fibrosis and steatosis suggesting a high prevalence of undiagnosed NAFLD among Latinos.

C091 Racial/ethnic disparities in awareness and attitudes towards the HPV vaccine among women living in the United States and Puerto Rico. [Nelybeth Santiago](#)

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Introduction In the United States (US), Human papillomavirus (HPV) is the most common sexually transmitted infection and an infectious agent related to cancer. The HPV vaccine is the most effective preventive method against cervical cancer. Studies have shown racial/ethnic disparities in knowledge and attitudes towards HPV and its vaccine. Few national studies have explored these disparities including Puerto Rican women, a group which higher rates of cervical cancer have been documented. In this study, we examined differences in awareness and attitudes toward the HPV vaccine among a sample of women 18 years of age and older from Puerto Rico (PR) and the US. Methods: We conducted a secondary analysis using data from the Health Information National Trends Survey (HINTS); conducted nationwide in 2007 (n = 4,145 HINTS U.S.) and in PR in 2009 (n = 417; PR). Multivariate logistic regression analysis assessed the association between racial/ethnic group (non-Hispanic White, non-Hispanic Black, Hispanics and PR women) and HPV vaccine awareness and attitudes, whilst adjusting for age, education, marital status and health insurance. All analyses were performed using the statistical software SPSS version 23.0. Results: A total of 4,562 women participated in this survey: 72.4% non-Hispanic White, 10.2% non-Hispanic Black, 9.1% Puerto Rican women and 8.3 Hispanics. Hispanics and Puerto Rican women had a higher attitude towards the HPV vaccine (55.9% and 74.8%), respectively. Multivariate logistic regression models shown

that, Hispanics women were 68% less likely to have heard that the vaccine prevents cervical cancer, compared to non-Hispanic White women (OR=0.32; 95% IC = 0.25 - 0.42, p<0.001). PR women are 2.4 times more likely of having a positive attitude towards the HPV vaccine compared to non- Hispanic White women in the US (OR=2.41; 95%IC=1.89 - 3.06, p<0.001). Non- Hispanic Black women were 25% less likely to have a positive attitude toward the vaccine when compared to non- Hispanic White women (OR=0.75; 95% IC = 0.61 - 0.93, p<0.001). Conclusion: The women living in PR showed a greater disposition toward the HPV vaccine. Non-Hispanic Black women in the US were least likely to be aware and have positive attitude towards the HPV vaccine. The disparities observed in the different races/ethnicities analyzed in this study, suggest racial and ethnic differences, which deserve further investigation so that health providers can better target educational across different racial/ethnic groups aiming to increase awareness and knowledge about HPV and its vaccination.

C092 Understanding the cancer needs of LGBTQ Latinx communities. [Mayra Serrano](#)¹, Jenifer Metz², Alejandro Fernandez¹, Eli Mendelson¹, Grizell Alvarado³, Mireya Munoz⁴, Erika Reyes⁵, Rosario Quintanilla⁶, Dayana Pelayo⁷, Zul Surani⁸. ¹City of Hope, Duarte, CA, USA, ²California Health Collaborative, Los Angeles, CA, USA, ³Alinea Medical Imaging, Pomona, CA, USA, ⁴PALS for Health, Los Angeles, CA, USA, ⁵The Wall-Las Memorias, Los Angeles, CA, USA, ⁶US FDA, Irvine, CA, USA, ⁷Cancer Legal Resource Center, Los Angeles, CA, USA, ⁸Cedars Sinai, Los Angeles, CA, USA.

Research targeting the needs of the LGBTQ community and their cancer prevention and screening behaviors is sparse, specifically the LGBTQ Latinx community. According to the National LGBT Cancer Network, the LGBT community is at a higher risk for cervical and oral cancers and are more likely to engage in risky behaviors contributing to these outcomes. Understanding the community's knowledge and behavior, as well as their interactions with primary care providers (PCP's), can help further the focus and tailor culturally appropriate educational programs and materials. The needs assessment was conducted in 2018 to better understand the LGBTQ Latinx community's experience with cancer screening, prevention and risk reduction strategies. The purpose of this first step was to help guide outreach and education efforts to best meet the needs of this often-underrepresented community. The needs assessment survey was conducted using REDCap, a secure web based application designed for research. Respondents were recruited at outreach events throughout Southern California, and with the help

of partnering organizations who serve the LGBTQ Latinx community. Upon completion of the survey, respondents were entered into a raffle to win a \$50 gift card. A total of 176 respondents have completed the survey thus far. Most (74%) were Latinx, between the ages of 21-39 (57%), identified as cisgender (82%), identified as gay (40%) or queer (28%). Most had shared their gender identity or sexual orientation with all their providers (44%) but respondents who identified as bisexual were less likely to share that information (X²=18.1; p<0.000). Most respondents (73%) have been afraid to share their gender identity and/or sexual orientation with a healthcare provider. Those who identified as queer were more likely to be afraid to share their sexual orientation (X²=12.1 p<0.035). Most (71%) prefer to be seen by an LGBTQ-trained health provider. Most (91%) have never received LGBTQ-tailored cancer information. Of those between the ages 21-29, 60% have not had a Pap test in the last 3 years. Most (53%) have not received the HPV vaccine. Of those eligible, 50% have not had a mammogram in the last 2 years and a third are overdue for their routine colonoscopy. Almost 70% self-report binge-drinking within the last year, with gay men being more likely to binge drink (X²=15.8; p<0.000). The smoking rate (20%) was almost twice the smoking rate in California (11%). Most (40%) report being exposed to environmental (or secondhand) tobacco smoke, with lesbian women being more likely to report exposure (X²=4.9; p<0.027). Most (78%) practice unprotected sex, with gay men being more likely to report (X²=6.3; p<0.012). Findings from this survey suggest that there is a critical need to educate the LGBTQ Latinx community, with LGBTQ-tailored information regarding cancer screening and prevention. It also suggests an urgent need to train healthcare providers on how to make their practice more culturally competent, safe, and welcoming for LGBTQ Latinx communities.

C093 Considering food policy as a tool for cancer prevention among Latino youth navigating food insecurity. [Celina I. Valencia](#)¹, Daisy Esquivel². ¹University of Arizona Cancer Center, Tucson, AZ, USA, ²University of Arizona, Tucson, AZ, USA.

Objective: Evaluating food policy as a public health tool to promote fruit and vegetable consumption across food insecure Latino youth for cancer prevention. Background: Latino populations have high rates of obesity related cancers and disproportionate rates of early onset of these cancers. Maintaining a healthy weight and daily intake of 2.5 cups of fruits and vegetables are among the outlined youth guidelines for cancer prevention from the American Cancer Society (ACS). Food insecurity is a salient consideration for

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Latino cancer prevention as Latino households are more likely to be food insecure than non-Latino households. Households experiencing food insecurity have limited access to affordable fruits and vegetables. Additionally, food insecurity has been associated with the development of pediatric obesity among Latino youth. Achieving the ACS dietary recommendations for cancer prevention may be a challenge for food insecure Latino households. Methods: We analyzed baseline data collected during a pilot six week healthy lifestyle intervention with H/L youth ages eight to 14 (N=20) participating in a free summer meal program in rural Maricopa County, Arizona. Meal menus from the free summer meal program were reviewed and assessed for nutrition content. Food intake measures were taken from the Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Surveillance Survey (YRBSS) 2017 data collection instrument. Participants provided answers via self-report. All participants self-identified as being Latino and the majority of the participants reported speaking Spanish at home (90%; n=18). Ninety-five percent (95%; n=19) of the participants reported receiving free lunch at school. Findings: One participant (5%; n=1) reported eating leafy greens at the frequency suggested by ACS guidelines. Two participants (10%; n=2) reported daily consumption of non-leafy green vegetables. Six participants (30%; n=6) reported daily consumption of fruit. The participant self-report food intake data suggests that the free summer program meals may have served as the sole daily meal for the youth. The free meals did not provide leafy greens or other vegetables. The free summer meal program menu followed the United States Department of Agriculture (USDA) nutritional requirements for reimbursement. Conclusion: Increasing the fruit and vegetable requirements of free meal programs could improve daily intake to encourage food insecure youth to meet the ACS dietary guidelines. Changes in USDA free meal program guidelines would have a substantial impact on the consumption patterns of food insecure youth. Food policies should be considered as a structural intervention for cancer prevention as a means for addressing dietary habits among food insecure populations.

C094 Social support and Pap test uptake among sub-Saharan African immigrant women in the United States. Adebola Adegboye, Adaeze Aroh, Gia Mudd-Martin. University of Kentucky, Lexington, KY, USA.

Background: Sub-Saharan African immigrant (SSAI) women in the United States suffer cervical cancer screening disparities despite known benefits of cervical cancer screening. The disparity in uptake of cervical cancer screening among this group is concerning given that sub-

Saharan Africa has the highest estimated rates of cervical cancer globally. Without routine screening, SSAI women may miss the opportunity for early detection contributing to later stage diagnosis and mortality. Immigrants' adaptation to a new environment and navigating through the complexities of the healthcare to promote preventive health utilization is enhanced by social support. Specifically, a growing body of evidence suggests that social support influences cancer screening behaviors. Understanding the relationship between social support and Pap screening behaviors can provide important insights into designing appropriate culturally relevant interventions to promote and facilitate Pap screening use among SSAI women. Methods: For this study, we conducted a secondary analysis of data from a cross-sectional study conducted with 107 English speaking SSAI women aged 21 and above. Using purposive and snowball sampling, participants were recruited from Central Kentucky between October 2016 and January 2017. Participants completed a questionnaire that included sociodemographic information, Pap screening history, and the Medical Outcomes Study (MOS) Social Support Survey. Analysis of Variance (ANOVA) was used to examine associations between Pap screening and each of the four MOS social support subscales (emotional, tangible, affection, and positive interaction) and the overall social support index. Results: Among the 107 women, the Pap screening test uptake was 65.7%. History of Pap screening was significantly associated with the affection ($F < sub > 1,106 < /sub > = 6.64, P = 0.011$) and positive social interactions subscales ($F < sub > 1,106 < /sub > = 5.50, P = 0.021$), and overall social support ($F < sub > 1,106 < /sub > = 3.94, p = 0.050$). Compared to women who had not had Pap screening, those who had been screened experienced greater support through affection ($M = 12.6; SD = 3.0$ vs. $M = 10.8; SD = 3.9$, respectively) and positive interactions ($M = 12.2; SD = 2.9$ vs. $M = 10.9; SD = 3.8$, respectively) as well as greater overall social support ($M = 66.8; SD = 16.7$ vs. $M = 73.1; SD = 15.0$, respectively). Conclusions: The finding that SSAI women who had a history of Pap screening had greater overall support compared to SSAI women who had not had screening suggests that interventions that increase social support might improve cervical cancer screening uptake in this population. At the same time, improved understanding of the influences of the various subtypes of social support on screening uptake is needed to better guide intervention development.

C095 Dense breast notification, breast density awareness, and breast cancer-related cognition and emotions in a predominantly Hispanic screening population. Mariangela D. Agovino¹, Carmen B. Rodriguez¹, Mary Beth Terry¹, Rachel Shelton¹, Karen Schmitt², Elise Desperito², Ying Wei¹, Rita

Kukafka¹, Parisa Tehranifar¹. ¹Columbia University Mailman School of Public Health, New York, NY, US, ²Columbia University Medical Center, New York, NY, US.

Dense breast notification laws enacted in over 35 states mandate written disclosure of information to women with high mammographic breast density (high MBD), as defined by the heterogeneously or extremely dense breast classification of the Breast Imaging-Reporting and Data System. In most states, the notification informs women with high MBD about higher breast cancer (BC) risk and lower sensitivity of mammography in women with dense breasts. It also advises women to consult their doctors about their risk and any need for additional imaging. We examined personal history of high MBD in relation to breast density awareness, and BC-related emotional (BC worry) and cognitive (perceived BC risk and mammogram benefits) factors. We further investigated whether these associations varied by race/ethnicity, educational attainment and language proficiency in 649 women presenting for screening mammography (40-60 years, 80% Hispanic, 47% high school or less education, 70% Spanish speaking). Only 24% of women reported having heard of breast density (awareness), of whom, 68% correctly reported a personal history of high MBD, but only 23% reported having initiated a discussion about breast density with their physicians. In multivariable models, breast density awareness was higher for women with a history of high MBD (OR=2.4, 95% CI: 1.5, 4.0), a history of follow-up after screening mammography for any reason (e.g., multiple recalls vs none OR=4.2, 95% CI: 1.9, 9.6), and family history of BC (OR=2.0, 95% CI: 1.0, 3.9). In the same multivariable model, awareness was lower for women who were foreign-born (e.g., OR=0.3, 95% CI: 0.2, 0.6 vs U.S.-born), Spanish speaking (OR=0.2, 95% CI: 0.1, 0.4 vs English speaking), and had lower education (e.g., OR=0.1, 95% CI: 0.1, 0.3 high school or less vs college vs higher degree). High MBD was associated with increased breast density awareness in all racial/ethnic, nativity, educational, and language proficiency groups. Breast cancer-related psychological outcomes differed only by breast density awareness but not by high MBD history. Women with breast density awareness reported higher worry (e.g., OR=2.5, 95% CI: 1.6, 3.9 for sometimes vs rarely/never worry), and higher absolute and comparative perceived BC risk (e.g., OR=2.8, 95% CI: 1.6, 5.0 for more risk vs less risk compared to average women). Women who knew about breast density also perceived less mammography benefits for earlier detection of breast tumors (OR=0.2, 95% CI: 0.1, 0.5) and reduced BC mortality (OR=0.4, 95% CI: 0.2, 0.6). In conclusion, dense breast notification to women with high MBD increases general and personal awareness of breast density; however, awareness

remains low in women with racial/ethnic minority and lower socioeconomic backgrounds due to lower prevalence of dense breasts in these population groups. Dense breast notification increases feelings of worry and perceptions of future risk of breast cancer and reduces perceptions of mammography benefits, which may affect breast cancer screening participation.

C096 Influence of primary care connectedness on early-stage cancer diagnosis among vulnerable patients in an integrated, safety-net setting. [Jessica D Austin](#)¹, Matthieu Chansard², Simon C Lee³, Bijal A Balasubramanian¹. ¹UTHealth School of Public Health in Dallas, Dallas, Texas, USA, ²UT Southwestern Medical Center, Dallas, Texas, USA, ³Harold C. Simmons Comprehensive Cancer Center, UT Southwestern Medical Center, Dallas, Texas, USA.

Introduction. Vulnerable populations, such as minorities, under-, and uninsured patients receiving care from safety-net settings, are more likely to receive a late-stage cancer diagnosis, resulting in higher mortality rates. Studies have shown that being connected to a primary care provider can play a vital role in timely diagnosis of early-stage cancer. Yet, vulnerable populations often have difficulty accessing primary care services and resources in most safety-net settings where care is fragmented. Receiving care in an integrated health system may help to reduce stage disparities by providing the infrastructure to support continuity and coordination of care. Yet, the degree to which vulnerable patients are connected to a primary care provider within an integrated setting is uncertain. A better understanding of the role of primary care connectedness among vulnerable patient populations receiving care in an integrated, safety-net hospital setting is needed to address the issue of stage disparity. We hypothesize that vulnerable patients connected to a primary care provider prior to their cancer diagnosis will have increased odds of early-stage cancer diagnosis. Methods. As part of an ongoing prospective study, we examined a cross-sectional sample of 66 patients diagnosed with Stage I-III colorectal and breast cancer receiving care within an integrated, safety-net hospital system during the years 2017 and 2018. We analyzed medical records data to generate descriptive statistics to characterized patient demographics, cancer-related demographics, and primary care connectedness - defined as having a primary care provider listed in the medical record prior to diagnosis. Using logistic regression, we calculated the odds of early-stage disease, according to the American Joint Commission on Cancer (AJCC) (stages I and II vs. III) as a function of primary care connectedness. Results. The majority of the

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sample was non-white (58%) and nearly half reported having no insurance (47%). Females comprised nearly 80% of the sample and one-third of the sample was diagnosed with colorectal cancer. In addition, nearly 60% had a primary care provider listed in the medical record prior to their cancer diagnosis and 60% received an early-stage diagnosis. Preliminary findings from the logistic regression support our hypothesis that vulnerable patients connected to a primary care provider prior to a cancer diagnosis had significantly higher odds of early-stage diagnosis (OR = 3.9, 95% CI 1.2-13.0). Conclusion. Being connected to a primary care provider may help to reduce stage disparities among vulnerable populations receiving care from an integrated safety-net setting. Integrated safety-net settings may facilitate early-stage diagnosis through clear referral pathways that ensure more timely diagnosis after screening abnormalities and prevent diagnostic delay.

C097 Navigation needs among African Americans. Oluwole A Babatunde¹, Melanie Jefferson¹, Jerry C Johnson², Chanita Hughes-Halbert¹. ¹Medical University of South Carolina, Charleston, SC, USA, ²University of Pennsylvania, Pennsylvania, PA, USA.

Abstract Introduction: Patient navigation is emerging as a strategy for addressing barriers to cancer screening among African Americans; however, navigation should address the specific needs and barriers to obtaining screening. The purpose of this study was to identify navigation needs for cancer screening in a community-based sample of African American men and women. Methods: Participants were enrolled in an observational study of community-based navigation for cancer control. Eligibility criteria were African American men and women aged 50-75 years who resided in the Philadelphia, PA metropolitan area, and had no personal history or symptoms of prostate, breast and colon cancer. The main outcome variable was navigation needs for cancer screening. The exposure variables that were assessed were socioeconomic characteristics, sociocultural factors such perceived risk of developing cancer and future temporal orientation and perceptions of social integration, and history of family members with cancer. Chi square tests and analysis of variance were utilized to assess the associations between potential factors and identified barriers. Results: A total of 268 participants were enrolled in the study and of these, 161 (60%) identified navigation needs for cancer screening: cost/lack of insurance (66, 25%), ignorance/lack of knowledge (73, 27%) and provider issues (22, 8%). The main barrier identified by participants that were younger (<56 years) was cost/lack of insurance (51%) while the main barrier identified by older

participants (>56 years) was ignorance/lack of knowledge (47%), [p: 0.04]. Most participants (63%) who had a higher perception of developing breast or prostate cancer identified ignorance/lack of knowledge as barrier to screening while most participants (51%) who had a higher perception of developing colon cancer had cost/lack of insurance as barrier to colon cancer screening, [p: 0.01]. Conclusions: Findings from this study suggest that navigation for cancer screening may need to address lack of knowledge and cost/lack of health insurance. Navigation programs for cancer screening may need to address different needs depending on the age and perceived risk of participants.

C098 Correlates of cervical cancer screening among Pacific Islander women on Guam and Hawaii. Grazyna Badowski¹, Louis Dulana¹, Lilinabeth P Somera¹, Kevin Cassel², Hye-ryeon Lee². ¹University of Guam, Mangilao, Guam, ²University of Hawaii, Honolulu, HI, USA.

Background There are significant disparities in cervical cancer incidence and mortality rates among Pacific Islander women. Native Hawaiian females have the highest incidence rates for cervical cancer in HI, and Chamorro and Micronesian have the highest incidence rates on Guam. The objective of this study was to examine the rates and the correlates of Pap smear test among Pacific Islander women. Methods This study conducted a cross-sectional survey using respondent driven sampling (RDS) of 802 women aged 21-65, including 235 Native Hawaiians, 190 Chuukese, 119 Marshallese, 157 Chamorro and 62 Filipino from Guam and Hawaii. Self-reported screening rates were compared across ethnic groups and migrant status using chi-square and Fisher's exact tests. Binary logistic regression was used to identify significant predictors of cervical cancer screening. Results Only 64% of our sample had received a screening for cervical cancer within the past 3 years. Filipino women had the highest screening rates (71%) followed by Chamorro (69%), Marshallese (68%), Native Hawaiian (64%) and Chuukese (58%). There was no significant difference in screening rates between women aged 21-39 and 40-65. Recent migrants were less likely to have been screen within the past 3 years when compared to US born respondents (OR=0.37; 95% CI: 0.16, 0.84) even after adjusting for education and having health care. Those women agreeing with the statement that health systems treat people unfairly based on their ethnic background were less likely to be screen (OR=0.52; 95% CI: 0.31, 0.81) when compared with those who did not agree. Conclusion The rates for cervical cancer screening tests for Pacific Island women remain far below the goals set forth in Healthy People 2010. Culturally competent, community-

based care for women is needed to increase Pap smear screening among minority groups

C099 Variance in mode of detection for breast cancer by breast density and stage at diagnosis: A pilot study. [Susanna N Basappa](#), Lila JF Rutten. Mayo Clinic, Rochester, MN, USA.

Introduction and Background: Mammography is thought to have an overall sensitivity of 87% according to the Breast Cancer Screening Consortium (BCSC). However, evidence from more recent studies indicate that a significant proportion of patients come into care with breast cancer symptoms, which trigger diagnosis rather than regular screening mammography. Women with breast cancer symptoms often have advanced cancer at diagnosis. This implies that previous negative mammograms are false negatives, and that screening mammography alone was insufficient for this population. Such populations include women with dense breasts, for whom mammography has a known 10-29% decrease in regardless of stage at diagnosis, and women who do not use screening mammography regularly or at all. Specific Experimental Aims: In a US population-based cohort of women who have developed first time breast cancer, we will 1) determine the variance in mode of detection, and 2) determine if mode of detection varied by breast density or by stage at diagnosis. Methods and Design: We identified a cohort of 386 women with a diagnosis of first time breast cancer (ICD codes) within a 7 county, 98.5% coverage population. We randomly sampled 30 women and performed chart review. The data were collated in REDCap, and reported with descriptive statistics. Results: In our pilot random sample (n=30), 33% (10/30) of women had DCIS, 30% (9/30) had non-advanced cancer, and 37% (11/30) had advanced cancer. For women with DCIS, 90% (9/10) were found with screening mammography, compared to only 44% (4/9) of non-advanced, and 45% (5/11) advanced cancers. Approximately 43% (13/30) of women in this sample had dense breasts. Interestingly, 61.5% (8/13) women with dense breasts, and 62.5% (10/16) of women with non-dense breasts had screening mammography as the mode of detection. Finally, among women with dense breasts, 46.1% (6/13) had DCIS, 30.8% (4/13) had non-advanced cancer, and 23.1% (3/13) had advanced cancer, while for women with non-dense breasts, 25% (4/16) had DCIS, 31.2% (5/16) had non-advanced cancer, and 43.8% (7/16) had advanced cancer. Conclusions and Future Directions: These pilot data suggest that our population reflects both the breast density rate (47%, BCSC) and the rate of advanced cancers (36%, SEER) found in the national population, and that there is a strong likelihood that regardless of breast density, but especially for non-DCIS,

screening mammography alone may not be sufficient detect breast cancer (44-45%) compared to the BCSC statistic of 87%. This may be due to misattribution of mode of detection for breast cancer, especially in symptomatic later stages of disease. Once the full study is completed, future research regarding outcomes (mortality and otherwise) and stage at diagnosis for patients who use additional screening methods may be valuable. In addition, for women with lower access to, or who choose not to use screening mammography, future research regarding revisiting the use of SBE and CBE as well as other modalities may also be valuable.

C100 Perceptions of breast cancer screening guidelines and intentions for screening: Qualitative commonalities of and differences between Black and White women age 50-75. [Maggie Britton](#)¹, Ashley J. Houston², Diana S. Hoover³, Lorna H. McNeill³, Robert J. Volk³. ¹University of Houston, Houston, TX, USA, ²Washington University School of Medicine, St. Louis, MO, USA, ³The University of Texas MD Anderson Cancer Center, Houston, TX, USA.

The purpose of this investigation was to explore perceptions of Black and White women 50-75 years of age about current breast cancer screening guidelines from three national organizations (National Comprehensive Cancer Network, American Cancer Society, and the U.S. Preventive Services Task Force) and in how these guidelines impact their screening intentions. Non-Hispanic Black (n = 29) and White (n = 28) average risk women were recruited from Houston community sites serving those with low-SES to participate in focus groups. Using questionnaires, women reported on: sociodemographic information, knowledge of screening guidelines, personal history of mammograms, and screening intentions. During the focus groups, participants were presented with the three organizations' screening guidelines and engaged in discussion on the benefits and harms of breast cancer screening mammography. We used a qualitative descriptive approach with inductive and deductive coding to analyze transcripts of video-recorded focus groups. Descriptive statistics were used to summarize questionnaire data. Participant average age was 65.93 years (SD=7.10). Among Black women, 12 had more than a high school degree and \$30k was the median annual household income. Among White women, 25 held higher than high school degree and \$60k-\$70k was the median income. All women reported receiving a mammogram. Most women also reported they "definitely will be tested" in the next year (Black N=22, White N=21). Qualitative analysis revealed both groups of women expressed they enjoyed learning about the three guidelines but questioned the rationale for guideline development; Black

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women appeared to do so more strongly, whereas some White women expressed satisfaction with multiple guidelines. Although Black and White women expressed concern for younger generations' access to screening information, White women expressed additional concern for low resource groups. Both groups expressed mistrust with the healthcare system, yet Black women expressed a desire to receive screening information from providers with whom they have deep and lasting relationships with, whereas White women expressed an interest in seeking information from multiple doctors in a less personal manner. Differences also emerged regarding screening intentions; while Black women expressed renewed motivation to continue screening, White women expressed greater openness to screen with less frequency and with discontinuation. These findings help to inform the ways healthcare providers might effectively customize and communicate screening information to racially/ethnically diverse groups of women. Although both groups of women expressed concerns regarding the guidelines, differences emerged in preferences for communicating and receiving screening information, as well as in the impact on their screening intentions.

C101 Assessing disparities in breast cancer screening attendance in Korean National Cancer Screening Program using population-based data. [Nhung Cam Bui](#)¹, Minah Suh², Yeol Kim², Eunji Choi¹, Jae Kwan Jun², Kui Son Choi². ¹National Cancer Center Graduate School of Cancer Science and Policy, Goyang, Republic of Korea. ²National Cancer Center, National Cancer Center Graduate School of Cancer Science and Policy, Goyang, Republic of Korea.

Background: Korea National Cancer Screening Program (KNCSPP) has been launched since 2002 providing free of charge breast cancer screening services for Medical Aid Program (MAP) enrollees and National Health Insurance beneficiaries in the lower 20% of income. It was then increasingly expanded to include National Health Insurance (NHI) beneficiaries in the lower 50% of income. Currently, MAP recipients and NHIS beneficiaries with a premium at 50% or lower are eligible for breast cancer screening free-of-charge, while the remaining NHI beneficiaries are eligible to undergo cancer screening with a co-payment of 10% of the cost of the procedure. Objectives: To examine the trend of disparity in attendance rates in breast cancer screening by insurance groups and whether these policies have effectively reduced income disparities in cancer screening. Methods: Using the National Cancer Screening Database from 2002 to 2014, we calculated the percentage of women attended breast cancer screening by insurance groups. Since insurance

category reflects the level of income of participants, we selected Slope Index of Inequalities (SII) and Absolute Concentration Index (ACI) as absolute measure and Relative Index of Inequalities (RII) and Relative Concentration Index (RCI) as relative measures. Then we calculated these weighted indexes using HD*Calc software and changes over time were examined using the Joinpoint Regression Program (National Cancer Institute). Results: We found different patterns of disparity in breast cancer screening. From 2002 to 2005, the screening rate was higher in MAP and NHI Lower 50% groups compared to NHI Upper 50% group, led to negative values of all calculated indexes. Disparity between insurance groups was highest in 2007 (in favor of NHI Upper 50% group; SII: 17.6; ACI: 23.7) and had an increasing trend from 2006 to 2014 (Annual Percent Change of RCI (95% CI): -11.1% (-15.7, -6.3); RII -10.7% (-15.2, -5.9)). In 2014, SII had decreased to 12.4 and ACI also had decreased to 16.1, but no significant trend was found in absolute measures of both cancers. Conclusion: Using various recommended summary measures of disparities and weighted for population share, we found significant decreasing in relative measures of disparities for breast cancer from 2006 to 2014, which suggests a positive effect of screening policies in Korea.

C104 A community guide systematic review of interventions engaging community health workers to increase appropriate breast, cervical, and colorectal cancer screening: Findings in underserved populations. [Jamaicia Cobb](#)¹, Yinan Peng¹, Devon Okasako-Schmucker². ¹Centers for Disease Control and Prevention, Atlanta, GA, USA, ²Georgia, Atlanta, GA, USA.

Background: Underserved adults in the United States are disproportionately not up-to-date with cancer screening. This systematic review examined the effectiveness of interventions engaging community health workers (CHWs) to increase breast, cervical and colorectal cancer (CRC) screening, especially among underserved populations. Methods: Potentially relevant publications were identified through a literature search from 1960 to July 2017. Included studies reported recent or repeat breast, cervical, or colorectal cancer screening. CHWs were recruited from or had close knowledge of the intervention community, received training to become a CHW, and implemented part or all of the intervention. Stratified analyses were conducted to examine intervention effectiveness among underserved populations. Results: Sixty-six studies with seventy study arms were included. Overall, screening rates increased for all three cancer types. Majority of the included studies examined interventions implemented among underserved populations.

These interventions were effective for study populations that were 100% minority or majority minority (median increase of 12.8pct pts across cancer types, 51 study arms), majority low income (median increase of 12.7pct pts across cancer types, 30 study arms), majority uninsured (median increase of 15.0pct pts across cancer types, 12 study arms), or lived in rural areas (median increase of 10.2pct pts across cancer types, 12 study arms). Conclusions: Interventions engaging CHWs were effective in increasing breast, cervical, and CRC screening for underserved populations.

C105 Exploring cancer health disparities among formerly incarcerated African Americans. [Vickii Coffey](#)¹, Carolyn Rodgers¹, Shirley Spencer¹, Joseph Strickland², Mary Muse³, Phoenix Alicia Matthews², Catherine Balthazar¹. ¹Governors State University, University Park,, IL, USA, ²University of Illinois at Chicago, Chicago, IL, USA, ³Wisconsin Department of Corrections, Wi, USA.

African Americans are disproportionately impacted by cancer rates, prevalence, incidents, morbidity and mortality. The National Cancer Institute, Division of Cancer Control and Population Sciences (2016), identified incarcerated persons as an understudied population for cancer risks and incidents. Further the availability of high quality data about cancer prevalence, incidence and mortality among people who experience incarceration is lacking. African American persons with a history of incarceration are at particular risk for chronic health diseases, cancer risks and health disparities due to their experience of incarceration; discrimination and stigma post-incarceration; personal lifestyle factors; socioeconomic status and, environmental barriers to cancer prevention and control resources. Despite these risk factors scant research has been conducted on risks for cancer health disparities among formerly incarcerated African Americans. This qualitative pilot study explored cancer health disparities among African American men and women (n=25) who were formerly incarcerated in an Illinois prison or the Cook County Jail. Four qualitative focus groups were conducted in Chicago to collect preliminary data on barriers to cancer health care access, screening, and treatment, post-release. The Integrative Model of Behavioral Prediction guided the study. An iterative process of content analysis was used to identify facilitators and barriers to cancer early detection, screening and treatment among the target population. Preliminary analysis revealed five central themes: (1) Increased access to health care through the Affordable Care Act, Medicaid, and County Care motivated active participation in health maintenance routines and cancer early detection, prevention and treatment services; (2) Long wait times for

appointments with primary care physicians increased reliance on emergency room visits; (3) Significant insurance and community resource, gaps occur at release and community reentry; (4) Costs for care (co-pays and deductibles, pre and post release) are barriers to routine care and delay urgent care-seeking; and, (5) Cancer health literacy and cancer awareness messages specifically designed for persons who experience incarceration is lacking. Study findings will inform the development of a pilot community health worker training and navigation intervention aimed at increasing access to cancer health care and decreasing cancer health disparities among formerly incarcerated African Americans in Chicago.

C106 Multilevel patient navigator-led intervention to optimize colonoscopy completion after an abnormal fecal immunochemical test. [Monica Hernandez](#)¹, [Jesse Nodora](#)², Balambal Bharti,² Jose L Diaz¹, Jessica Marquez¹, Felipe Garcia-Bigley¹, Christian Ramers¹, Jessica Houghton³, Elva Arredondo³, Samir Gupta². ¹Family Health Centers of San Diego, San Diego, CA, USA, ²University of California San Diego, San Diego, CA, USA, ³San Diego State University, San Diego, CA, USA.

Purpose: Impact of colorectal cancer (CRC) screening with the fecal immunochemical test (FIT) depends on completion of diagnostic colonoscopy after abnormal FIT, as failure to complete diagnostic colonoscopy is associated with 2.4 fold increased risk of CRC death. Colonoscopy completion after abnormal FIT ranges from 18% to 57% among Federally Qualified Health Centers (FQHCs) in San Diego County. Our goal is to report the initial successes and challenges of a multi-level, patient navigator (PN) led intervention to optimize colonoscopy completion after abnormal FIT faced largely by Hispanic/Latino patients in our geographic area. Methods: At a single primary clinic within a large FQHC in San Diego's predominantly Latino community, we implemented a multi- component intervention to promote colonoscopy completion for patients with abnormal FIT led by a bilingual/bicultural PN. PN responsibilities included monitoring timely review of FIT results by ordering provider, results provision to patients, insurance authorization, facilitating referrals for GI consultation and colonoscopy scheduling. Health system barriers (such as failure to order colonoscopy) were addressed by having the PN prompt the relevant team member to complete required care steps. Patient barriers (such as understanding FIT results, procedure scheduling and fears) were addressed through phone and in-person encounters by the PN. Summary: During the period of March to August 2017, 45 patients had an abnormal FIT. Out of 45 patients, three were not eligible for navigation due to prior

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colonoscopy completion. Of the remaining 42, 26 did not complete colonoscopy (14 lost to follow-up, 4 pending GI consult, 4 pending colonoscopy, 4 declined). The PN directly interacted with 28 patients of which 16 (57%) successfully completed colonoscopy. These preliminary results show a low overall rate of colonoscopy completion (16/45=36%) with nearly one third of patients (14/45=31%) lost to follow-up. Conclusions: In our initial experience with a PN-led, multi-level intervention for promoting colonoscopy completion after abnormal FIT, 57% of patients who interacted with the PN completed a colonoscopy procedure. Challenges such as loss to follow up remain a barrier to intervention success. Our results suggest that multi-level interventions led by a PN have potential to optimize follow through of colonoscopy completion after abnormal FIT.

C107 Surveillance mammography and Follow-up care in Black and White breast cancer survivors. Megan C Edmonds, Sunny J Kim, Vanessa B Sheppard. Virginia Commonwealth University, Richmond, VA, USA.

Purpose Adherence to surveillance mammography following a breast cancer (BC) diagnosis is a pivotal way to mitigate late stage BC recurrences and ultimately mortality for breast cancer survivors (BCS); yet there are stark racial disparities in adherence to routine follow-up care post-treatment. This study seeks to address disproportionately low adherence rates to breast surveillance guidelines among Black BCS, when compared to White counterparts, by evaluating environmental, social, and psychosocial factors (e.g., attitudes, knowledge) that may influence survivor's adherence to surveillance mammography. Methods The mixed method designs involve recruiting and screening Black and White BCS concurrently through an epidemiologic survey and online focus groups via social media platforms (e.g., Facebook, Instagram Quora reddit). Data from survey will employ descriptive and bivariate statistics to assess the relationship between environmental, social and psychosocial factors with surveillance mammography and follow-up care. Guided by the Integrated Behavioral Prediction conceptual framework, thematic and linguistic analyses will be conducted for the online focus group text data to find emergent themes and subthemes. Results This study will provide preliminary results highlighting primary factors (e.g., barriers, facilitators) that influence adherence, by race. Our findings will focus on associated factors for women's adherence to surveillance mammography, to inform survivorship guidelines and clinical practice. Conclusion Knowledge gained from the study will provide clinicians crucial points of communication; identify important modifiable factors needed in survivorship

behavioral interventions, and inform strategies for screening messages. Furthermore, understanding factors that support adherence to surveillance mammography among Black BCS will uncover novel approaches to educate and reach this group in efforts to reduce survival disparities.

C108 Sociodemographic determinants of colorectal cancer screening completion among women adherent to mammography screening guidelines. Deeonna E Farr¹,

Leslie E Cofie¹, Alison T Brenner², Ronny A Bell¹, Daniel S Reuland². ¹East Carolina University, Greenville, NC, USA, ²University of North Carolina at Chapel Hill, Chapel Hill, NC, USA.

Background Several initiatives have focused on increasing colorectal cancer (CRC) screening rates, but national rates still fall below 70% for many groups, particularly those in underserved communities. Examining CRC screening determinants in groups who have completed screening for other cancer sites may provide useful information to support future initiatives. In 2015, 71.6% of women nationally completed mammograms in the past two years, while only 63% completed any CRC screening procedures. Purpose We examined data from the 2015 National Health Interview Survey to identify determinants of CRC screening completion among women adherent to breast cancer (BrCa) screening guidelines. We hypothesized that race, income, and psychosocial factors would explain CRC screening non-adherence. Methods The sample contained women (N=1206), aged 50-74 years, BrCa free, who completed a mammogram in the past two years, and were of average CRC risk (no first degree relative with cancer, history of polyps or inflammatory bowel disease). Bivariate associations between sociodemographic, health access, perceived BrCa risk, perceived CRC risk variables, and CRC screening status were examined using chi-square tests. Multivariate logistic regression analysis was used to examine factors associated with CRC screening completion. Results Prevalence of CRC screening in this sample was 55.52% including: Sigmoidoscopy (1.47%), colonoscopy (50.33%), fecal occult blood test (10.81%). Significant differences in CRC screening ($p < .01$) by education, income, insurance, foreign birth status, and language regularly spoken were revealed. Having insurance (OR:4.52, CI:2.20-9.31) and being foreign-born (OR: 1.77, CI:1.17-2.66) were independently associated with CRC screening completion after controlling for all other factors. Conclusion CRC screening rates among women completing breast cancer screening were lower than the national average for women. Neither perceived BrCa risk nor perceived CRC risk explained CRC screening behavior. Income and health

insurance variables appear to drive sociodemographic differences in screening completion. However, foreign-born status had a direct impact on CRC screening behavior. Differences in the availability of free or low-cost screening programs for BrCa and CRC may explain these findings. More research is needed to understand how sociodemographic factors interact to impact CRC screening rates in this group.

C109 Colorectal cancer knowledge and screening status among companions of patients undergoing a colonoscopy: An opportunity for a targeted intervention.

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PURPOSE: To determine the colorectal cancer (CRC) knowledge, screening compliance, and preference(s) for an intervention to improve screening compliance among companions of patients undergoing colonoscopy. **METHODS:** Between March and June 2017, we approached individuals who accompanied patients undergoing a colonoscopy (companions) at one of three endoscopy centers to participate in a survey to determine CRC and CRC screening knowledge, attitudes, beliefs, and behaviors. Participants were also asked to provide input about content and format for a future CRC screening intervention. Companions aged 50 to 75 years were eligible to participate. **RESULTS:** Of the 338 companions approached for participation, 224 (66%) were eligible and completed the survey. Most companions were a spouse or family member (83%), married/living with a partner (78%), female (57%), and had less than a college degree (51%). The sample included companions from a minority race/ethnicity (20%) and those with an annual household income of less than \$30,000 (18%). In addition, companions predominantly had health insurance (96%), reported having a personal doctor (88%) and had an evaluation by a healthcare provider within the last year (85%). Among companions at average-risk for CRC (n=166), 38 (23%) were not within screening guidelines and 29 companions reported that they had never completed a screening test. Many companions lacked knowledge about what age to begin CRC screening (85%) and factors associated with increased risk for CRC such as being African American (73%) or male (60%). Among companions not within screening guidelines, the most frequently reported barriers to CRC screening were being asymptomatic (74%) and lack of a provider recommendation (32%). While the majority of companions agreed or strongly agreed that CRC would be serious to their health (99%) and that CRC

screening would help protect their health (97%), only 29% of average risk companions not within screening guidelines reported that they intended to undergo CRC screening within the next 6 months. Suggestions for a future CRC screening intervention to be completed by waiting companions included a video shown on a tablet that included men and women from all races/ethnicities, a doctor and nurse, testimonials from individuals who completed CRC screening, and the intervention should last 15 minutes or less. **CONCLUSIONS:** Given that companions of patients undergoing a colonoscopy wait about two hours for test completion, developing a brief CRC screening intervention for them addresses an overlooked educational opportunity. The brief intervention should address the most commonly reported barriers, the benefits of screening, men and women of different races/ethnicities, doctors and nurses, testimonials from individuals who completed screening, and should activate companions to talk to their doctor about CRC screening.

C110 Implementation of an integrated framework for a breast cancer screening and navigation program for under-resourced women.

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Background As detection and treatment for breast cancer in the United States have improved, racial and ethnic disparities persist. Utilizing an implementation science framework to inform an evidence-based breast cancer screening and navigation program within Federally Qualified Health Centers (FQHCs) with community stakeholders can mitigate multiple barriers to breast cancer screening. **Methods** Utilizing an integrated theoretical framework of the Practical, Robust Implementation and Sustainability Model (PRISM) and the social ecological model (SEM), the University of Illinois Cancer Center, University of Illinois Hospital & Health Sciences System (UI Health) including Mile Square Health Centers (MSHC) FQHC, and the Chicago Department of Public Health (CDPH) developed a breast cancer screening and navigation program to tackle breast cancer disparities in Chicago among under-resourced women, known as the Mi-MAMO program. To increase access to screening services, patient navigators conducted community outreach and engagement activities. Program partnerships were forged with community-based organizations, healthcare systems and insurers. Program

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outcomes were monitored using standardized performance measures. Results Between January-December 2017, 103 women received a screening mammogram at MSHC. To increase screening rates, the Mi-MAMO program was started in August 2017. Between January-December 2018, the number of women who received a screening mammogram at MSHC increased to 1051. From August 2017 (start of program) to December 2018, 779 women received navigation to screening and/or diagnostic services through the Mi-MAMO program. The majority of women were uninsured (63.9%) and 95.5% were racial/ethnic minorities. Twenty-four percent (n=185) of women completed diagnostic services and ten women received positive breast cancer diagnoses (mean age 49.7 years). All diagnosed women were successfully navigated to treatment. The Mi-MAMO program is on-going. Conclusion Deploying an integrated framework that merges an implementation science and multi-level behavioral health framework for patient navigation programs has the potential to increase breast cancer screening utilization and awareness among under-resourced populations who may be at higher risk for breast cancer.

C111 Identifying barriers to screening mammography use among low-income women in a public hospital setting in Los Angeles. [Janell Holloway](#)¹, Isabel del Canto², Kenny Morales², Gianna Ramos², Ashkan Moazzez³, Griselda Gutierrez³, Carmen Mendez³, Junko Ozao-Choy³, Christine Dauphine³. ¹Charles Drew Univ/UCLA, Los Angeles, CA, USA, ²UCLA, Los Angeles, CA, US, ³Harbor-UCLA, Torrance, CA, USA.

Background: Mammography remains the most effective method for early detection of breast cancer. The Affordable Care Act requires that screening mammography be fully covered without any out-of-pocket expense for all patients. Still, disparities in mammography use persist, with the lowest rates reported for women of Hispanic ethnicity and those with Medicaid-based insurance coverage. The aim of this study was to administer a phone survey to better understand the barriers to mammography use among racially diverse low-income women with Medicaid coverage. Methods: All female patients age 50 to 74 at our facility that had not had a screening mammogram in the recent 24 months were identified. Data were collected from the electronic medical record (EMR) including race/ethnicity, primary language spoken, having had a PCP visit in the previous 12 months, having had a prior mammogram, history of depression, personal history of breast or other cancer, zip code (to estimate median household income), and marital status. Three attempts were made to contact these patients by

phone to administer a phone survey that asked them to (1) state in their own words the primary reason for not getting a mammogram and (2) to complete a survey based on the Health Belief Model (HBM) subcategories: issues with self-efficacy (SE), perceived barriers (PBa), perceived benefits (PBe), perceived susceptibility (PS) and cues to action (CA). Barriers were assessed by race and characteristics collected from the EMR as well as survey responses. Results: There were 810 women due for mammography screening, 333(41%) of which were Hispanic, 146(18%) Black; 112(14%) Asian, 61(8%) Non-Hispanic White, and 158(20%) listed as 'Other'. Data were collected from the EMR for all 810 women, and 339 (42%) were reached and agreed to participate in the survey. There were 320(40%) patients that did not speak English as their primary language, 441(54%) had not had a prior mammogram, 177(22%) had never visited a primary care physician in the system, and 237 (29%) had not visited one within the last 12 months. The most common self-stated reason Hispanic patients did not get a mammogram was due to lack of knowledge about insurance coverage of mammography; for Black women it was being busy with work related or personal and family illnesses; for Asian a language barrier; and for White/Non-Hispanic it was occupation with illness. The most commonly identified barrier for all races based off of the additional survey questions was limited mammography hours. Conclusion: In an underserved, predominantly Hispanic population who has Medicaid coverage, health professionals should better educate Hispanic patients on their insurance coverage, provide educational material that includes Asian languages, and consider that extended hours could help patients of all races find time to schedule a mammogram as efforts to minimize barriers will ultimately serve to decrease racial health disparities in breast cancer outcomes.

C112 Implementing a colorectal cancer screening intervention in Texas FQHCs: A qualitative evaluation of provider perceptions. [Lynn N Ibekwe](#)¹, Paula M Cuccaro¹, Lara S Savas¹, Melissa A Valerio¹, Lewis E Foxhall², Maria E Fernandez¹. ¹The University of Texas Health Science Center at Houston School of Public Health, Center for Health Promotion & Prevention Research, Houston, TX, USA, ²The University of Texas MD Anderson Cancer Center, Office of Health Policy, Houston, TX, USA.

Background: Federally qualified health centers (FQHCs) are well positioned to increase colorectal cancer screening (CRCS) in underserved populations who most often have low screening rates, including racial/ethnic minorities, the uninsured, and low SES individuals. To optimize effectiveness

and promote sustainability of CRCS programs in FQHCs, we assessed provider/staff perceptions of the facilitators and barriers to implementing the Alliance for Colorectal Cancer Testing (ACT) program in Texas FQHCs, funded by the Cancer Prevention & Research Institute of Texas (CPRIT). **Methods:** UTHealth School of Public Health research staff conducted in-depth, face-to-face, semi-structured interviews in English with providers/staff at ACT FQHCs. Interviews lasted 30–45 minutes and elicited perceptions about facilitators and barriers to implementation of ACT. They were audio recorded, transcribed, and coded by hand deductively, using thematic content analysis to identify key themes. **Results:** We interviewed 20 individuals across 5 ACT FQHCs. Most were non-Hispanic white (38%) and female (88%). Years worked at clinic ranged from 11 months to 11 years (mean 6.2 years) and hours worked per week ranged from 12–60 hours (mean 42.2). Participants' positions ranged from clinic CEO to provider to clerical staff. Seven themes emerged as facilitators to implementation: 1) external support (e.g., large cancer center facilitated implementation); 2) external funding (e.g., covered screening and diagnostic services); 3) patient tracking and monitoring (e.g., patient list review, FIT distribution/follow-up); 4) clinic leadership and staff support (e.g., clinic level prioritization of CRCS, understanding/acceptance of roles, active leadership support); 5) staff training; 6) same day FIT return (e.g., completing FIT at clinic or at home and returning same day); and 7) community outreach (e.g., newsletters, FIT distribution at community events). Four themes emerged as barriers: 1) CRCS completion and return process/structure (e.g., USPS refusal to pickup/deliver samples, patient inability to return FIT, FIT completion errors, lab delays); capacity (e.g., perception that patients and providers lack time); education (e.g., perception of patient lack of understanding of risk); and clinic resources (e.g., need for simple, bilingual educational materials). **Conclusion:** In addition to maintaining program facilitators, increased CRCS patient education/awareness, simple and bilingual educational materials, processes to support FIT return, a contact person coordinating CRCS tasks, ongoing staff training, and a clinic manual describing all roles/responsibilities are important for improved implementation and sustainability of ACT. Findings from this evaluation will help inform development of strategies to facilitate FQHCs' implementation of ACT and other intervention strategies to increase CRCS by reducing two key factors, financial and structural barriers.

C113 Endoscopic history potentially explains survival differences in Hispanics and Blacks with gastric cancer. Christie Y Jeon, Yu-Chen Lin, Bianca Luna-Lupercio,

Robert Haile. Cedars-Sinai Medical Center, Los Angeles, CA, USA.

Background: Hispanic and Black persons are at higher risk for gastric cancer (GC) in the United States, as compared to White counterparts. Economic analyses demonstrate that endoscopy for GC screening may be cost-effective in Hispanic and Black Americans, but no prevention guidelines support gastric cancer screening for these minorities in the U.S. Targeted *Helicobacter pylori* (*H. pylori*) testing and treatment may also help to prevent GC. It is unknown how common endoscopic history and *H. pylori* testing are among Hispanics and Blacks diagnosed with gastric cancer and how this is related to stage at diagnosis and survival. **Methods:** We employed SEER-Medicare data on Hispanic (n=1,428) and Black (n=1,774) patients diagnosed with GC in 2004–2013. We compared stage of disease by history of gastric imaging and *H. pylori* testing >18 months prior to GC diagnosis. Qualifying imaging included esophagogastroduodenoscopy, endoscopic ultrasound, upper gastrointestinal series. We tested for differences in proportions by Chi-squared tests and survival differences by log-rank test. We performed Cox regression analyses adjusting for age, sex, residence in large metropolitan areas, neighborhood poverty index, histology, and tumor location to determine the association of prior gastric imaging with survival. **Results:** Hispanic and Black GC patients shared similar histories of endoscopic imaging (17%, 16% respectively). Hispanics and Blacks who had a history of endoscopy were more likely to be diagnosed at Stage I (41% in both), as opposed to those without endoscopic history (26% and 29%; $p < 0.0001$, $p = 0.0003$ respectively). Hispanics with a history of endoscopy lived longer with GC (12 months) as opposed to those without (9 months, $p = 0.03$), while the survival difference by endoscopic history was not significant among Black patients (9 months vs. 8 months, $p = 0.06$). In survival analysis without adjustment for stage, endoscopic history was associated with a lower rate of death among Hispanics (HR:0.84, 95%CI: 0.72, 0.98) and in Blacks (HR:0.87, 95%CI: 0.76, 0.997). After adjustment for stage of disease, the association between endoscopy and survival disappeared (Hispanic: HR=1.01, 95% CI 0.88, 1.16; Black: HR:1.01, 95% CI 0.86, 1.18). Hispanics were more likely to be tested for *H. pylori* (9.9%) than Blacks (5.0%). Prevalence of stage I disease at diagnosis was not different by history of *H. pylori* testing in Hispanics (38% tested vs. 31% non-tested, $p = 0.16$) nor among Blacks (30% tested vs. 28% non-tested, $p = 0.65$). **Conclusion:** Endoscopic procedures and *H. pylori* testing are underutilized in elderly Hispanic and Black patients at risk for gastric cancer. Hispanic and Black gastric cancer patients with endoscopic history were more likely to be diagnosed with Stage I disease than those without endoscopic history,

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leading to a survival advantage. A prospective study examining the benefit of endoscopic screening for early detection of gastric cancer in racial and ethnic minorities at high risk for gastric cancer is warranted.

C114 Prostate-specific antigen (PSA) screening practices before and after the U.S. Preventive Services Task Force (USPSTF) 2012 Recommendations: A focus on foreign-born men. Jarrett A. Johnson, Richard Moser, Gary Ellison, Damali Martin. National Cancer Institute, Rockville, Maryland, USA.

Background: Prostate cancer (PC) is the most frequently diagnosed cancer and a leading cause of mortality among men worldwide. There is evidence of a relationship between nativity and prostate cancer incidence; and, by 2050, one in five Americans living in the U.S. will be an immigrant. Little is known about the uptake of PSA screening for U.S.-based foreign-born men. Moreover, it is unclear if the prevalence of PSA screening changed within this population after the U.S. Preventive Services Task Force (USPSTF) 2012 recommendations against routine PSA screening. **Objectives:** Our objectives were to: 1) describe the factors associated with PSA screening prevalence for U.S.-based foreign-born men and 2) compare PSA screening prevalence before and after the USPSTF 2012 PSA screening recommendation for these men. **Methods:** Data were from the 2010 and 2015 National Health Interview Surveys and limited to men ages 40 years and older who responded to the question “Ever had a PSA test?”. Data were further limited to men who indicated that they were not born in the U.S. 50 states or the District of Columbia and were living in the U.S. for five years or more. Multivariable logistic regression was used to examine determinants of PSA screening and to compare screening prevalence in 2010 and 2015. **Results:** The sample included 2,735 foreign-born men with the largest ethnic group being those who identify as Hispanic (46%). The final multivariable model included race/ethnicity, age, education, marital status, insurance status, survey year, and length of time living in the U.S. Asian men were less likely than non-Hispanic white men to report ever having had a PSA test (Odds Ratio (OR)=0.47, 95% Confidence Interval (CI) [0.36 – 0.61]). In addition, men who were widowed had lower odds than men who were married or living with a partner of ever having had a PSA test (OR=0.65, 95% CI [0.47 – 0.89]). Moreover, when compared to men who reported having a first degree relative with prostate cancer, men with unknown family history of prostate cancer had lower odds of ever having had a PSA test (OR=0.54, 95% CI [0.32 – 0.91]). Overall, men surveyed in 2015 were less likely to report ever having had a PSA test than those in 2010 (OR=0.76, 95% CI

[0.63 – 0.92]). **Conclusion:** Among foreign-born men, lower odds of PSA screening prevalence was reported by men who were Asian, widowed and those with unknown family history of prostate cancer. Moreover, the USPSTF 2012 PSA recommendations against routine PSA screening appeared to lower PSA screening behaviors for these men several years later. These results can inform the development of prostate cancer interventions for this underserved group.

C115 Yale Cancer Disparities Firewall Project: Taking lifestyle change and cancer screening into the community to reduce cancer disparities. Beth A. Jone¹, Roy Herbst², Sakinah C. Suttiratana¹, Monique Killins¹, Denise Stevens¹, Briyana Green¹, Jacqueline Prinz¹, Jose DeJesus¹. ¹Yale School of Public Health, Yale Cancer Center, New Haven, CT, USA, ²Yale School of Medicine, Yale Cancer Center, New Haven, CT, USA.

Background: Cancer incidence rates in Connecticut are well above the national average with the greatest burden on African Americans, Hispanic/Latinos, and those with low socioeconomic status. In 2018, we launched the Yale Cancer Center’s (YCC) Cancer Disparities Firewall Project with the goal of providing a protective firewall around our catchment’s at-risk populations, specifically targeting breast, prostate, lung, and colorectal cancer. **Methods:** The Aims of the Cancer Disparities Firewall Project are to: 1) expand community outreach & education; 2) establish a “health” navigation program; 3) create infrastructure to support sustainable change. Strategies to accomplish Aims 1 & 2 require our presence in communities, workplaces, and other venues that are not always associated with health care institutions. Focusing on 2 key components of the cancer control continuum, prevention and early detection, and adapting for individual settings (e.g., minority populations are concentrated in mostly urban areas of the state), we conduct health fairs, provide “Ask the Doctor” forums, and hold free screening events on a regular basis. Supported by a bicultural/bilingual male and female staff, we provide outreach in Spanish and English. For Aim 2, we established a “health” navigation program that provides geo-coded linkages to care in the communities where people live by combining skilled health navigators with a digital platform, NowPow. As accessing services to support lifestyle change (e.g., tobacco treatment, weight management) and timely cancer screening may be low priority, we screen for social determinants of health (SDOH), as well as cancer prevention barriers and tailor referrals to services accordingly. Based on multiple points of contact beginning with in-person enrollment at a community based event, we facilitate access by building relationships that continue as needed. The

third aim is to build sustainability into our efforts through internal and external partnerships. Results: Since June, 2018, community outreach and education events (Aim 1) have increased by 80%, as has documented outreach to individuals (from 3345 to 5500), with racial/ethnic profiles that reflect the target population. In its first 2 months, the health navigation arm of the project (Aim 2) has recruited 141/511 individuals into navigation with 30% (42/141) currently followed (71.4% female, 65% AA, 20%H/L, 6% other). Now working with almost 100 community and institutional partners in order to assure sustainability (Aim 3), as one example, we partner with a local community college to build a cancer track into a patient navigation program, adapting the curriculum as needed. Summary: Addressing the four cancers that drive observed cancer disparities, our approach uses outreach and technology to increase our navigation in-reach to vulnerable communities, and is an important step toward establishing linkages to care. Further, this work lays the foundation for new implementation strategies and research.

C116 High-risk HPV screening and typing shows high co-infection rate and potential for low vaccine coverage in a low- and middle-income country. Aaron E Atkinson¹, Carlos Alberto Matute Mandujano², Suyapa Bejarano², [Linda S. Kennedy](#)¹, Gregory J Tsonalis¹. ¹Norris Cotton Cancer Center, Lebanon, NH, USA, ²La Liga Contra Cancer, San Pedro Sula, Honduras.

Introduction. Cervical cancer is almost always a result of infection with a high risk human papillomavirus (hrHPV) of which there are 14 different types. This type of cancer is prevalent in low- and middle-income countries (LMICs) where screening programs for pre- or invasive cervical cancer by Pap test or visual inspection with acetic acid are limited in scope as is local expertise in evaluating Pap smears. Since 2006, a HPV vaccine protecting against hrHPV types 16 and 18 has been recommended by the WHO, and through the GAVI Alliance, is provided to some fractions of populations in more than 70 countries. A newer and more expensive vaccine protects against 9 types of HPV. A broader spectrum 9-valent vaccine released in 2014 protects against HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58. Preventing cervical cancer by vaccination against HPV is considered to be a promising strategy. **Materials and Methods.** In three separate studies, we implemented molecular screening for hrHPV from cervical swab specimens, providing access to pre-cancer testing for women from several regions of Honduras, which is ranked the poorest country in the northern hemisphere. We screened 2,645 women from two rural regions and an

urban region of Honduras. In the final study of 1725 Honduran factory workers, we substituted a large-capacity rice cooker for a standard laboratory hotplate to accelerate laboratory throughput for DNA extraction. A DNA-based multi-color melt curve analysis by PCR followed, and we were able to rapidly screen for all 14 hrHPV types. Results. Across all three studies, there was an average hrHPV positivity prevalence of 22%. The most common types of hrHPV found in each study were as follows: Study 1 hrHPV types 16, 31, 58, 59, and 68; Study 2 hrHPV types 16, 39, 52, 58, and 68; and Study 3 were hrHPV types 16, 35, 58, 63, and 64 were the most common. Among those infected with a hrHPV type, 18% had co-infections with multiple hrHPV types. Based on these results, the vast majority of infected women would not have been protected by the divalent HPV vaccine and a significant proportion of women would still not be protected by the multivalent vaccine, which does not cover the hrHPV types 35, 39, 52, 59, 63, 64, 88 found in these samples. **Conclusions.** Cervical cancer remains a prevalent and deadly disease in LMICs. Our studies examining the prevalence of hrHPV types in several different regions of Honduras identified high prevalence rates of viral types not targeted by commercially available vaccines. These findings suggest that vaccination programs alone should not be considered complete coverage against cervical cancer-causing high-risk HPV, and that further location-specific testing of cervical tissue for hrHPV typing is warranted.

C117 West Virginia Lung Cancer Project. [Stephenie K. Kennedy-Rea](#)¹, Shonta Chambers², Lauren Hixenbaugh¹. ¹WVU Cancer Institute, Morgantown, WV, USA, ²Patient Advocate Foundation, Hampton, VA, USA.

Introduction: WVU Cancer Institute's Cancer Prevention and Control (CPC) and the Patient Advocate Foundation (PAF) is working to address lung cancer disparities in West Virginia (WV). Their goal is to decrease lung cancer mortality, the leading cause of cancer deaths in WV, and improve early diagnosis of lung cancer in the state.

Brief Description: In 2016 there was no infrastructure for lung cancer screening in WV. The rural state's significant geographic barriers, low socioeconomic status, lack of lung cancer screening facilities, and limited provider knowledge regarding screening guidelines created substantial challenges.

The major aim of the WV Lung Cancer Project (WVLCPP) is to increase lung cancer screening among low-income and limited resourced individuals across WV. The project has three primary components: provider outreach and

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engagement; patient awareness and education; and case management support.

Summary of Data: The WVLCPC initially developed a case management (CM) protocol with one of the major Medicaid Managed Care Organizations (MCO) in the state in order to reach those eligible for screening and navigate them to primary care providers for care. The result of protocol implementation was the identification of lack of provider knowledge. The team then surveyed health care providers to further assess their knowledge, attitudes, beliefs, and practices regarding lung cancer screening. The results indicated a need for education on the screening guidelines, including recommended test, frequency, eligibility, and insurance coverage. As a result, project staff provided academic detailing to health care providers and created a continuing education webinar.

Beyond the need to enhance health care provider understanding, there was a need to educate the public about lung cancer screening and the location of services. To enhance patient awareness and education, the project established and promoted the WV Lung Cancer CareLine and participated in community education events.

Between 2016 and 2019, American College of Radiology (ACR) screening facilities increased from five to 24 sites. The WVLCPC was able to facilitate the addition of 12 sites to the ACR Registry by working one-on-one with various health care entities during this time.

Two of the MCOs fully implemented the CM protocol. Thousands of patients were assessed, hundreds referred to a primary care provider, tens were screened, and two cases of lung cancer were found. As a result, both companies incorporated the protocol into their operations and have case managers contacting patients to reduce barriers to screening.

Conclusion: By partnering with care providers, the public, and health insurance payors, the project has expanded the lung cancer screening infrastructure in WV. As the project concludes in 2019, the state's comprehensive cancer coalition, Mountains of Hope, will work to promote lung cancer screening in WV and continue the efforts of PAF and the WVUCI.

C118 Utilizing health navigators and technology to increase cancer screening and healthy lifestyle: Preliminary findings from the Yale Cancer Disparities Firewall Project. Monique Killins, Sakinah Suttiratana, Roy Herbst, Jacqueline Prinz, Briyana Green, Jose DeJesus, Denise Stevens, Beth A Jones. Yale University, New Haven, CT, USA.

Background Patient navigation is proving an effective

evidenced based strategy for cancer screening, diagnosis and treatment. Novel solutions are needed to provide community members with local cancer screening and prevention resources. The Yale Cancer Disparities Firewall (Firewall) recently launched a "health" navigation program that combines health navigators, technology and screening for social determinants of health (SDOH) to initiate ongoing wellness relationships with people in need of cancer screening and risk reduction support. Health navigation utilizes a digital platform, NowPow, LLC, to connect community members to cancer screening, prevention and social resources. Health navigation, powered by NowPow, LLC, is a key component as we build a cancer disparities firewall around at-risk populations by addressing patient cancer risk reduction, screening and social needs using health navigators. Methodology Health navigators recruited community members for health navigation at Yale Cancer Center community outreach and engagement events. Participants identified one or more self-management goals of interest: tobacco treatment, weight management, eating healthier food, physical activity and cancer prevention. With telephone follow-up, health navigators screened individuals using NowPow, LLC, a digital platform that can tailor zip code specific screening and prevention and SDOH resources to individual needs. Resource lists were populated for each participant based on SDOH screenings and participant self-management goals and sent via text message and/or email. Health navigators tracked participant engagement with resources at 1 week, 2 week and 3-4 week intervals via telephone. Results Navigators contacted 511 individuals in a 2-month period: 141 demonstrated interest and 42 entered the program (71.4% female, 65% AA, 20%H/L, 6% other). Health Prevention Priorities: healthier food: 71.4%, physical activity: 66.7%, weight management: 61.9%, cancer prevention: 40.5%, finding healthy food: 31%, tobacco treatment: 11.9%. The top 3 SDOH needs were housing instability (32%), food insecurity (24%), and utilities (23%). Distances to referred services ranged 4.7 to 11.1 miles from the participants' zipcode. Within 4 weeks of follow-up, 54% of individuals contacted at least 1 resource. The major reason given for not accessing referred resources was "too busy". Conclusions In this pilot project, we are using NowPow, LLC, a digital interface to facilitate health navigators in linking community members to both cancer screening and SDOH resources. Although interest in receiving navigation has been relatively high, accessing the resources that have been provided lags. Understanding the barriers to uptake will be key to the development of strategies to overcome lifestyle barriers such as time constraints and competing priorities to ensure the utilization of local cancer screening and prevention and SDOH resources by all participants.

C119 Cancer screening disparities among rural sexual minority individuals: Implication for prevention and policy. [Min Jee Lee](#), Wiley Jenkins, Eric Adjei Boakye.

Department of Population Science and Policy, Southern Illinois University School of Medicine, Springfield, IL, USA.

Introduction: Although a few studies have examined screening uptake among sexual minority, almost none have examined it in the specific context of rural populations. Therefore, the objective was to assess how cancer screening utilization might vary by residence (rural versus urban) and sexual orientation. Methods: Publicly available population-level data from the 2014 and 2016 Behavioral Risk Factor Surveillance System (BRFSS) were utilized. Study outcomes included recommended recent breast, cervical, and colorectal cancer (CRC) screening receipt. Independent variables of interest were residence (rural/urban) and sexual orientation (heterosexual/gay/bisexual). Weighted proportions and multivariable logistic regressions were used to assess the association between the independent variables and the outcomes. Analyses were conducted in 2018. Results: Rates for all three screenings were lowest in rural areas and among sexual minority populations (cervical cancer among lesbians, rural at 64.8%; breast cancer among lesbians, rural at 66.8%; and CRC among bisexual, rural men at 52.4%). For CRC screening, both rural gay and heterosexual rural males were less likely to receive screening (aOR=0.45; 95%=0.24-0.73 and aOR=0.79; 95%=0.72-0.87, respectively) while only rural heterosexual females were less likely (aOR=0.87; 95%=0.80-0.94). For cervical cancer screening, heterosexuals were less likely to be screened (aOR=0.83; 95%=0.72-0.94), and there were no differences for breast cancer. Conclusions: We found that rural sexual minorities may experience disparities in cancer screening utilization associated with the compounding barriers of rural residence and sexual orientation. Further work is needed to identify factors influencing these disparities and how they might be addressed.

C120 Evidence-based strategies to enhance colorectal cancer screening in American Indian communities. [Shiraz I Mishra](#)¹,

Mark P Doescher², Jennifer Hatcher³, Kevin English⁴, Dorothy Rhoades², Peter Lance³, Shane Pankratz¹, Jessica Blanchard⁵, Nicholas Edwardson⁶, Michelle Hopkins², Andrew Sussman¹, Zsolt Nagykaldi², Cheyenne Jim⁴. ¹University of New Mexico Health Sciences Center, Albuquerque, NM, USA, ²Oklahoma University Health Sciences Center, Oklahoma City, OK, USA, ³University of Arizona, Phoenix, AZ, USA, ⁴Albuquerque Area Southwest Tribal Epidemiology Center, Albuquerque, NM, USA, ⁵Oklahoma University, Norman, OK, USA, ⁶University of New Mexico, Albuquerque, NM, USA.

Despite the proven effectiveness of colorectal cancer (CRC) screening, American Indians (AIs) have some of the lowest CRC screening rates. Nearly two-thirds of US adults are current with US Preventive Services Task Force guidelines for CRC screening. In contrast, based on Indian Health Service (IHS) Government Performance and Results Act (GPRA) data, AI screening rates range from a low of 28% in the Phoenix Area, to 30% in the Albuquerque Area and a high of only 51% in the Oklahoma Area. The AI CRC Screening Consortium was formed by the National Cancer Institute-Designated Cancer Centers at the Universities of Arizona, New Mexico, and Oklahoma to address the major regional CRC screening disparities. The Consortium's overall objective is to increase CRC screening delivery and uptake in AIs aged 50 to 75 years at average risk for CRC through the implementation of cost-effective multilevel, multicomponent evidence-based interventions (EBIs) across AI populations (on and off tribal lands) in the tri-state region. As part of the planning phase of the project (Year 1), we completed mixed-methods environmental scans (focus group and interviews, and readiness to change surveys) among tribal members and multisector healthcare providers practicing at Indian Health Service (IHS, I), Tribal (T), and Urban Indian (U) (I/T/U) healthcare facilities across the three states. In all, we conducted seven focus groups, 71 interviews, and three surveys at nine I/T/U healthcare facilities. We organized the focus group and interview data according to The Guide to Community Preventive Services (The Community Guide) recommendations for strategies to increase: community demand, community access, and provider delivery of CRC screening. We will provide quotes and summaries underscoring the EBIs and strategies recommended by the multisector healthcare action teams for implementation at their healthcare facilities. We will also describe the establishment of the Consortium and challenges experienced in conducting research with multiple tribal and federal entities and regulatory authorities. The use of community-academic participatory approaches has facilitated bidirectional and mutually beneficial knowledge integration, collaborative inter-dependent partnerships, equity in data ownership, and capacity enhancement. The scope of this project presents an opportunity to reduce CRC incidence and mortality affecting thousands of AIs. Our collaborative work will create opportunities for future research addressing the spectrum of CRC prevention, detection, and treatment in AI populations across the US.

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C121 Cervical cancer knowledge and perceptions among women in Malawi: Qualitative data from a high-burden, low-resource setting.

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Introduction: Coverage of routine cervical cancer screening in Malawi is very low, even though it has the highest cervical cancer burden in the world. We performed a multi-level assessment of Malawian women's knowledge and perceptions of cervical cancer risk and screening, following recent scale-up of screening and treatment programs. **Methods:** Based on the Multi-Level Health Outcomes Framework, we conducted interviews with 60 adult Malawian women at facilities that offer cervical cancer screening; eligible participants were recruited regardless of HIV status or history of cervical cancer screening. Trained female researchers asked women about their experiences with and opinions of cervical cancer disease and screening. Interviews were audio recorded with permission, transcripts were translated from Chichewa (the local language) to English, and a theory-informed codebook was developed. Analysis focused on thematic differences across groups by age, HIV status and screening history. **Results:** Half of the sample (n=30) had either never been screened for cervical cancer or were at the facility for their first-ever screen. Most women said that cervical cancer is dangerous, and many knew someone affected. Many women spoke about the importance of screening for prevention of cancer. Risk factors were generally well-understood, including increased risk with HIV, although this was misunderstood by some HIV-negative women to mean they were not at risk. Gender issues were highly salient, relating to sexual transmissibility, husbands' support of screening, and modesty if screened by a male clinician. Women had commonly heard rumors about the procedure being painful or dangerous. **Conclusions:** Despite high knowledge among Malawian women about cervical cancer disease and the importance of screening, there remain significant challenges. This study highlights the role of interpersonal and system-level barriers. Future work should work to strengthen service delivery, target social networks and spouses, and develop targeted language for HIV-positive and -negative groups especially in high-burden settings.

C122 Efficacy of in-language mailers on receipt of colorectal cancer screening among Chinese Americans: A randomized controlled trial.

Tung T Nguyen¹, Janice Tsoh¹, Angela Sun², Kent Woo³, Joyce Cheng², Ching Wong¹, Jian Zhang⁴, Janet Bernet⁵, Stella Pan⁵, Ginny Gildengorin¹. ¹UCSF, San Francisco, CA, USA, ²Chinese Community Health Resource Center, San Francisco, CA, USA, ³NICOS Chinese Health Coalition, San Francisco, CA, USA, ⁴Chinese Hospital, San Francisco, CA, USA, ⁵North East Medical Services, San Francisco, CA, USA.

Background: Colorectal cancer (CRC) is the second most common cancer among Chinese Americans, the largest group of Asian Americans. Asian Americans and Chinese Americans are less likely than non-Hispanic whites to be screened for CRC. There are few randomized controlled trials (RCT) of interventions to increase CRC screening among Chinese Americans. **Methods:** A community-academic research team consisting of academic researchers and community organization leaders collaborated with 3 health care systems to develop an intervention called Small Media Interventions for Limited English Speakers (SMILES) project. The SMILES intervention consisted of a mailed letter and brochure about CRC screening in English and Chinese sent twice over the course of 1 month. The mailer also included a link to a website which provided additional in-language written and video information about CRC screening. Chinese American patients aged 50 to 75 who were due for CRC screening in 3 healthcare systems (an academic medical center, a community hospital network, and a federally-qualified health center) in San Francisco were eligible for the RCT. Eligible patients were randomized to the intervention arm versus a usual care comparison arm. Intervention participants were also given the opportunity to return a postcard indicating that they had read the mailer. CRC screening status were assessed using electronic health record 9 months after the first mailing. **Results:** There were 1,707 enrolled patients with 929 in the intervention arm and 778 in the comparison arm. The average age was 59.6 years (SD 6.0), with 45.6% female, 12.4% English speakers, 63.2% Cantonese speakers, and 10.8% Mandarin speakers. At 9-month post-intervention initiation, the CRC screening rate was 51.9% in the intervention group and 49.5% in the comparison group (p=0.331). For the age group 50 to 60, the screening rate was 47.4% vs. 42.2% (p<0.0001). Multivariable analyses showed that the adjusted odds ratio for the intervention was 1.10 (95% CI: 1.001, 1.21). Other significant factors associated with CRC screening at post-intervention were female sex (OR: 1.37, 95% CI: 1.10, 1.71), age 61-75 (OR: 1.64, 95% CI: 1.57, 1.71, ref. age 50-60), and speaking a Chinese language (OR: 2.42, 95% CI: 1.22, 4.76). In multivariable analyses of the intervention group only, those who had documented engagement with the intervention

(returning a postcard or going to the website) had an OR of 2.96 (95% CI: 2.08, 4.21) for CRC screening receipt compared to those who did not. Conclusions: A linguistically appropriate intervention to promote CRC screening among Chinese Americans using a mailed reminder, brochure, and access to a website led to a modest but significant increase in CRC screening compared to usual care among overdue patients in 3 healthcare systems. Mailed in-language materials should be considered as a low-resource intervention to increase CRC screening among Chinese Americans.

C123 The San Francisco Cancer Initiative: Addressing disparities in colorectal cancer screening in community health centers. Robert Hiatt¹, Carly Rachocki¹, [Michael B. Potter](#)¹, Ma Somsouk¹, David Ofman². ¹University of California San Francisco, San Francisco, CA, USA, ²San Francisco Community Clinic Consortium, San Francisco, CA, USA.

Background: Despite being among the wealthiest cities in the United States, San Francisco continues to suffer from disparities in colorectal cancer (CRC) screening and diagnostic follow up among low-income and ethnically diverse residents served by community health centers (CHCs). The San Francisco Cancer (SF CAN) Initiative, a collaborative effort to reduce cancer in San Francisco, is dedicated to decreasing these and other cancer-related disparities. Purpose: To describe the approach and preliminary outcomes of the SF CAN's CRC Task Force. Methods: Using principles of community engagement and implementation science, we developed a logic model to address CRC screening disparities. As inputs, the logic model features a partnership with the San Francisco Community Clinic Consortium (SFCCC) and its partner nonprofit community health centers. The goal is to increase screening with fecal immunochemical testing (FIT) and when needed, follow up colonoscopy, for its patient population. Continuous program evaluation utilizes the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) Framework. Results: The SFCCC has created a quarterly reporting system to track CRC screening rates and facilitate collaborative goal setting for its partner CHCs. Six SFCCC clinical sites serving 18,815 adults aged 50-75 have used SF CAN's technical assistance and Quality Improvement Stipends (QIS) to engage in an analysis of barriers and facilitators to screening and implement multi-level evidence-based interventions tailored to their identified specific needs. Barriers include low literacy, language, economic, and social obstacles to CRC screening such as lack of transportation or reliable access to housing or a private bathroom. The Task Force has assisted with staff training, patient education

materials, and strategies for FIT distribution and collection. We have helped several sites switch from multi-sample FIT kits to evidence-based, user-friendly single sample FIT, and encouraged the development of tracking and navigation systems for abnormal FIT. In the first six months of QIS program, 5,199 patients were provided with FIT, and 3,932 (75.6%) successfully completed it. In addition, a first-ever review of 298 patients with abnormal FIT at these sites revealed that only 144 (48%) completed colonoscopy within 6 months, a finding that may lead to new initiatives to improve patient navigation. Additional SFCCC clinical sites will join the QIS program in the coming year. Conclusion: The SF CAN CRC Task Force has provided a model of academic and community partnership through which interventions to address CRC screening disparities in medically underserved communities can be implemented.

C124 Interventions for increasing colorectal cancer screening uptake among African-American men: A systematic review. [Colin Riley](#)¹, Charles R Rogers¹, Matthew Huntington¹, Margaret Foster², Kenneth M Boucher³, Kola Okuyemi¹. ¹University of Utah School of Medicine, Salt Lake City, UT, USA, ²Texas A&M University, College Station, TX, USA, ³Huntsman Cancer Institute, Salt Lake City, UT, USA.

African-American men have the lowest 5-year survival rate for colorectal cancer (CRC) of any ethnic/racial group in the country, which may be due in part to poor screening rates. Evidenced-based interventions are needed to increase CRC screening (CRCS) uptake among this population, as screening is associated with increased survival. Using Rayyan QCRI, a systematic review was employed to synthesize the evidence from published studies evaluating interventions to increase CRCS uptake among African-American men. Potential studies were retrieved from MEDLINE, CINAHL, EMBASE, and Cochrane CENTRAL resulting in 960 initial results. Articles published before 1998 were excluded, as well as studies that were not explicitly about CRCS uptake, were not in English, did not take place in the U.S., and/or did not include African-American men. Only primary analyses and evaluations of CRCS uptake interventions, as opposed to interventions considering behaviors related to but not directly indicative of CRCS uptake, were considered. After an abstract screening and full-text review was conducted by two blinded team members, 41 publications ranging from 2000 – 2018 made up the final sample. These studies were then coded for study setting, geographic region, theory, intervention type, and limitations. The majority of studies were conducted in either a medical center or church in the southern U.S. Nearly half of the studies did not report a theoretical foundation, yet in

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those which did, the Health Belief Model, Preventative Health Model, and the Stages of Change Model were the most common. Reflecting recent screening guidelines endorsed by the American Cancer Society, studies had age ranges starting as early as age 45. The most common interventions of 122 types utilized were telephone education (18%), mailed/electronically-sent educational materials (14%), mailed or administered in person CRCS stool-based kits (12%), and patient navigation (11%), and printed materials given to individuals in person (11%). The most effective intervention types were patient navigation and free stool kits, but were limited due to sustainability cost. Such a finding indicates a need for more research to uncover effective interventions that are not cost-prohibitive. Print education materials that were culturally-tailored specifically for African-Americans often performed as well as control interventions (e.g., those utilizing the Centers for Disease Control and Prevention's Screen for Life Campaign materials). Furthermore, given most of the interventions took place in the south, studies in other regions of the country may uncover different CRC screening uptake patterns, as there may be regional variation in intervention effectiveness among African-American men. A major weakness our review revealed was that only 2 of the 41 studies (5%) solely focused on African-American men, warranting the needed for intervention samples comprised exclusively of African-American men to eliminate CRC screening uptake inequities.

C125 Identifying barriers to follow-up colonoscopy completion after an abnormal fecal test: Interviews with gastroenterology staff. Jennifer S Rivelli¹, Jennifer L Schneider¹, Jamie H Thompson¹, Amanda F Petrik¹, DeeDee Torres², Gloria D Coronado¹. ¹Kaiser Permanente Northwest, Portland, Oregon, United States, ²Sea Mar Community Health Centers, Seattle, Washington, United States.

Background Colorectal cancer (CRC) is the second leading cause of cancer death in the United States. Fecal immunochemical tests (FITs) are an accepted way to identify patients at risk for CRC. However, patients who receive an abnormal FIT result must obtain a follow-up colonoscopy. Rates of follow-up colonoscopy are low in most healthcare settings, particularly in federally qualified health centers (FQHCs). FQHC patients who need a follow-up colonoscopy must undergo several steps, including obtaining a referral to a gastroenterology specialist (GIs), and preparing for and attending the procedure. Interventions such as patient navigation may improve follow-up colonoscopy adherence for FQHC patients, yet little is known about the system-level barriers to the colonoscopy process. Methods As part of the

Predicting and Addressing Colonoscopy Non-adherence in Community Settings (PRECISE) study, we interviewed care coordinators and GIs who receive referrals from local FQHCs for follow-up colonoscopies from abnormal FIT tests. Our goal was to understand their referral processes and what they perceive to be the primary barriers for patients completing the follow-up colonoscopy. Two trained qualitative staff conducted the interviews by telephone, and content analyzed the data from interview notes and transcribed recordings. Results We interviewed 12 GI and care coordinator staff across 7 different GI practices. Six of the seven GI practices attempted to facilitate the follow-up colonoscopy by not making a pre-procedure visit mandatory but rather allowing completion by telephone, if the patient is healthy and of low risk. Most GI practices identified using the same type of bowel preparation with community referred patients as it is inexpensive, covered by most insurance plans, and considered safe. The greatest barrier to colonoscopy completion by referred community patients stated by all GI practices was not having transportation to and from the appointment or understanding the need for an escort to be present, particularly at the completion of the colonoscopy. Lack of understanding the bowel preparation process was also a very common barrier, including when to start the process, what foods to avoid, and the need to consume the entire preparation. Faxed referrals from FQHCs lacking proper documentation of the abnormal FIT or incomplete patient medical information for the referral was also cited as hindrances to timely follow-up colonoscopy completion. Most GI practices reported limited resources and time for helping patients address structural challenges pertaining to transportation, escorts, or a private place to complete the preparation. Conclusion Our findings identify key areas where patient navigated efforts are needed, and inform the educational and structural challenges facing FQHC patients when interfacing with GI specialists for a follow-up colonoscopy. These findings can further inform the design and implementation of patient navigation programs in the community health center setting.

C126 Challenges implementing anal cancer screening for women living with HIV: Clinical providers and staff perspectives. Serena A Rodriguez¹, Robin T Higashi¹, Andrea B Betts¹, Cynthia Ortiz¹, Jasmin A Tiro¹, Amneris Luque¹, Arti Barnes². ¹University of Texas Southwestern Medical Center, Dallas, TX, USA, ²Cornell Hill Scott Health Center, New Haven, CT, USA.

Purpose: The HIV Medicine Association recommends anal Pap tests for women living with HIV (WLWH) with a history

of abnormal cervical Pap tests, ano-receptive intercourse, or genital warts. This study describes current anal cancer screening practices and provider- and staff-identified challenges conducting anal cancer screening for WLWH in an integrated safety-net healthcare institution and community healthcare organization serving underinsured patients in a metropolitan city in Texas. Findings inform our understanding of factors that need to be addressed prior to implementation of system-level anal cancer screening policies and protocols for WLWH, a population at increased risk for anal cancer due to persistent HPV infection. **Methods:** We purposefully sampled providers, clinical staff, and administrative staff to participate in in-person semi-structured interviews assessing participant experiences with anal cancer screening, documentation, and follow up, and attitudes toward future anal cancer screening among WLWH. Audio-recorded interviews and field notes were transcribed and thematically analyzed using an iterative deductive and inductive coding scheme. **Results:** We completed interviews with 25 individuals: providers (n=11: 7 safety-net, 4 community), clinical staff (n=10: 8 safety-net, 2 community), and administrative staff (n=4: safety-net). **Current practices.** No system-level policies or protocols for anal cancer screening existed within the safety-net institution or community organization for WLWH. Instead, HIV providers performed anal Pap tests ad hoc, most frequently as diagnostic evaluations based on visual inspections or patient-reported symptoms. To follow up on abnormal test results, providers referred patients to Proctology Clinic, where wait for an appointment was about one year. **Challenges.** Without anal cancer screening policies or protocols, clinical teams were unclear on whether the HIV team or gynecology specialty team should lead screening efforts. Electronic health records only recorded cervical Pap test results in the “Pap” field, leaving providers to record anal Pap results in a notes section. This limited the ability to produce systematic reports or track screening. Finally, providers and staff expressed reluctance to conduct systematic anal cancer screening until greater infrastructure existed to manage referrals for abnormal anal Pap test results. **Conclusions:** Anal cancer screening and follow-up for WLWH require organization and coordination between multiple care teams, and protocols should clarify clinical pathways and responsibilities as patients transition between HIV, gynecology, and proctology teams. Further, clinical information systems must be updated to facilitate teams’ communication and to support anal Pap test ordering and documentation. Finally, downstream infrastructure to support follow-up must accompany upstream implementation of an anal cancer screening policy.

C127 Prevalence of human papillomavirus infection in a sample of 21- to 29-year-old women living in Puerto Rico.

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Human Papillomavirus (HPV) is the most common sexually transmitted infection worldwide. High-risk HPV infections are observed in women with genotypes 16 and 18, among others, and are the main risk factor for cervical cancer. Cervical cancer is the seventh most diagnosed cancer among women in Puerto Rico, and accounts for 2.5% of mortality rates. The aim of this study was to establish the prevalence of high-risk HPV, in a large cohort of women ages 21 to 29 living in Puerto Rico during 2014-2016. **Method:** A retrospective longitudinal analysis was performed to a sample of 5,749 HPV results that were recorded in a clinical database of Puerto Rican women ages 21 to 29 from 2014-2016. Furthermore, the prevalence of the high-risk HPV genotypes, 16 and / or 18, was ascertained along with the proportion of women who resolved the initial positive infection during the study period. **Results and Conclusion:** We found that among those with a positive HPV result, about one-third (35.17%) had a high-risk HPV infection. Women between the ages 21 to 23 showed the highest prevalence (40.6%) of high-risk HPV compared to the other age groups. Among all high-risk HPV, genotype 16 was the most prevalent. About a subsample of 458 women had at least two positive results of HPV infection, 217 of those women had an initial positive result for HPV and only 108 (49.7%) showed a resolution of the infection. Our study confirms there is a high prevalence of high-risk HPV in young women compared to other age groups. **Discussion:** Women with persistent HPV infection have a major risk factor for developing cervical cancer. There is an urgent need to develop a good prevention strategy to reduce the high-risk HPV infections, especially in the younger population, as was shown in this study. Future research is needed to assess the impact of preventive methods, such as the HPV vaccine, and the outcome in the prevalence and incidence of cervical cancer and other HPV-related cancers. Promoting education and awareness could further reduce the HPV-associated cancer burden, prevalence and incidence in this minority population.

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C128 The intersection of structural violence, environmental inequalities, and family history: Study design and methodology.

Jyotsna Jagaj¹, SWIO Sisters Working it Out², Kent Hoskins¹, Sage Kim¹, Maria Argos¹, Susan Hong¹, **Molly Scannell Bryan¹**. ¹UIC, Chicago, IL, USA, ²SWIO, Chicago, IL, USA.

Introduction Breast cancer is the most commonly diagnosed cancer in American women, and women of color bear a disproportionate burden of breast cancer morbidity and mortality. Breast cancer risk is influenced by harmful social forces (“structural violence”), environmental inequality, and familial history, but the independent effects of each of these factors explain less than half of breast cancer diagnoses. Combining these distinct risk domains is expected to improve the ability to predict risk for breast cancer, but few studies have collected data that will allow for assessment of combined risk factors in each domain. Study Description We are undertaking a secondary data analysis of data gathered from women who underwent a mammography screening and answered questionnaires about family history of cancer (N=600 women consented). We aim to assess the relationships between ecological indicators of structural violence, environmental exposures, and clusters of high familial risk of cancer. Further, we aim to characterize whether breast density, an early risk factor for later breast cancer that will be extracted from mammography notes using Natural Language Processing, is associated with structural violence, familial risk, and environmental exposures. The project goals will be revised over quarterly meetings with our partner organization Sisters Working It Out (SWIO), and SWIO will facilitate dissemination of research results to neighborhoods with traditionally low mammogram rates. A full conceptual model and causal diagram of the study aims will be presented for discussion, along with details on the analytical approaches used for the creation of the environmental index and natural language processing. Discussion and Expected Findings Our study will provide a more detailed understanding of how knowledge of structural violence can complement knowledge of family history and environmental exposures to identify women who may be at increased risk for breast cancer. Additionally, it will suggest possible routes of intervention that could occur before breast cancer develops invasive potential. As the study will begin the analytic component in October, presentation at the AACR Conference on the Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Underserved will provide a valuable space for discussion of the methodology and study design.

C129 Do phone-based discussions about the importance of colorectal cancer screening delivered before a fecal immunochemical test (FIT) mailing improve return rates?

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Patients who have never completed a fecal immunochemical test (FIT) may benefit from phone-based discussions about the importance of colon cancer screening before receiving the FIT in the mail. Colorectal cancer is the second-leading cause of cancer death in the United States, and screening rates are disproportionately low among Latinxs. In 2015, only 63% of eligible adults, and 50% of Latinxs, were up to date with colorectal cancer screening recommendations. Mailed FIT outreach programs have been shown to improve colorectal cancer screening rates in community health centers, with improvements ranging from 22% – 45%. Despite the widespread use of primers and reminders for mailed FIT outreach programs, data are sparse on how these communications influence FIT completion rates. Data from our previous evaluation of mailed FIT outreach showed that adults who have never completed a FIT have a much lower FIT return rate than adults who have (17.1 vs 45.1; $p < 0.01$). As part of the Participatory Research to Advance Colon Cancer Prevention (PROMPT), which involved a partnership with a Los Angeles-based community health center that provides medical services to 300,000 patients annually (82% are Latinx), we tested whether patients who had never completed a FIT could benefit from phone-based discussions about the importance of colorectal cancer screening. Eligible patients were 50-74, due for their screening, and assigned to a wedge 1 clinic ($n = 8$ clinics; 6,872 patients). A total of 2,825 patients had no electronic health record evidence of having completed a prior FIT. These patients were randomized to receive the text primer ($n = 1,622$) or live call primer ($n = 1,203$). All live primer calls were delivered by bilingual health education staff trained by the research team. Patients were then mailed a FIT kit with an introductory letter and wordless instructions on completing the FIT, followed by two automated phone call reminders and live reminder calls delivered by the care team. We used logistic regression to compare the effectiveness of live call vs text message primers on FIT completion rates 3 months after the FIT mailing. Randomized patients (who had never completed the FIT) had a mean age of 58 years (SD, 6.0), 51% were female, and 80% Latinx. In the text primer arm, the overall FIT completion rate was 14.7%, and 14.6% among those who were successfully delivered the text primer. In the live call arm, the overall FIT completion rate was 18.8%, and 30.0% among those who

had a discussion with health education staff. Controlling for age, preliminary analyses indicate that patients who received a live call were 1.35 times more likely to complete a FIT within 3 months of the mailing than those who received a text message primer (OR=1.35 [1.10, 1.64]). Live phone call primers, delivered before the FIT is mailed, boost screening rates among those who have never completed a FIT.

C130 The cultural experiences of gender and sexual minorities accessing preventative breast cancer screenings: Making medical settings more inclusive to increase uptake. Kristi Tredway. St. Mary's College of Maryland, St. Mary's City, MD, USA.

In analyzing the cultural obstacles that gender and sexual minorities (GSM), specifically gender-nonconforming women and transpeople, face when accessing preventative breast cancer screenings, I have uncovered various intersections that are in play. The primary feature for this particular study is specific female body parts, the breasts, which may or may not produce conflicted feelings for GSM. Other intersections include gender performances, sex, race, and sexuality, along with educational status and economic status (which facilitates gaining health insurance) in terms of the importance, affordability, and understanding of breast cancer screenings. This is all done with the backdrop of a terrifying and deadly disease without early detection. GSM are the most underserved within this realm of medicine, and it is my contention that there are specific cultural obstacles causing this. Recently, there has been growing evidence that gender-nonconforming women and transpeople access breast screenings less often than their counterparts (Hiestand, Horne & Levitt, 2007; Wang, Griffiths & Grande, 2017, 2018; Barefoot, Warren & Smalley, 2017; Bazzi, Whorms, King & Potter, 2015; Tabaac, Sutter, Wall & Baker, 2018); however, as of yet, there have been no large-scale analyses to determine exactly what the cultural features are that are causing obstacles for these two groups in getting breast cancer screenings. Themes have emerged from my initial interviews for this project that will guide the much larger study. The underlying cultural features specific to GSM accessing medical settings as well as these themes that have emerged from the data will be the focus of my presentation.

C131 Patient compliance with professional society guidelines for surveillance and re-screening following initial screening colonoscopy. Meng-Han Tsai¹, Sudha Xirasagar², JiaJia Zhang². ¹California State Uni-Monterey Bay, Seaside, CA, USA, ²University of South Carolina, Columbia, SC, USA.

Background: Screening colonoscopy followed by timely surveillance and rescreening colonoscopy can prevent most colorectal cancers (CRC) by enabling removal of pre-cancerous polyps. Surveillance compliance with professional society guidelines is unknown. We examined compliance patterns of a community-based cohort screened at an endoscopy center in South Carolina with documented 83% and 89% CRC incidence and mortality reductions, respectively, validating very high polyp clearance, which supports using these data to study surveillance timing compliance relative to recommendations. Historically, data sources to study surveillance compliance have been limited because no colonoscopy series is documented with evidence of high polyp clearance at screening. Methods: Patients provided screening colonoscopy from September 4, 2001 to December 31, 2015 followed through July 31, 2016 were studied for surveillance and rescreening colonoscopy timing classified by risk status at screening and to study the impact of the 2006 surveillance guidelines - 1-year surveillance for sessile adenoma removed piecemeal, hyperplastic polyposis syndrome or > 10 adenomas; 3 years for 3-10 adenomas, ≥1cm adenoma, villous features or high-grade dysplasia; 5 years for 1-2 small adenomas; 10 years for no adenoma or < 3 small hyperplastic polyps in left colon). Surveillance was classified as appropriate, overuse and underuse within each risk category. We used Kaplan-Meier analysis with the log-rank test, and logistic regression to identify the factors associated. Findings: Of 14,048 study-eligible patients (after excluding patients aged <40/≥75 years, CRC at screening, 2nd colonoscopy not due during study period, attained 75 years, and missing pathology), majority were female (51.0%), aged 50-59 years (55.1%), black (51.9%), and had Medicare/private insurance (87.9%). Of 6,817 surveillance-eligible, 52.6% completed it, 17% at the appropriate time. Among 3-year- and 5-year-eligibles, overuse (39% and 36%, respectively) and underuse (48.4% and 55.8%, respectively) were widespread. Among the 10-year rescreening-eligible, 45% completed it (mean 5.08 years since screening), 39.9% too early, 5.1% timely or late. Compared to pre-guideline period, overuse decreased among the 5-year category (25.5% vs. 48.6%), and increased among the 3-year category (41.5% vs. 35.4%). Among the 10-year rescreening group, overuse increased (60.4% vs. 31.6%). Overuse more likely among the 5-year group vs. ≤3-year (OR:2.7; 95%CI: 2.1- 3.4). Other overuse predictors were: adenoma ≥1cm (OR:1.9; 95%CI: 1.3- 2.7) and multiple advanced adenoma features (OR:2.1; 95%CI: 1.4-3.2). For underuse, right-sided adenoma (OR:1.6; 95%CI: 1.2-2.1) and Medicaid (OR: 3.4; 95%CI: 1.4-8.1) were significant. Conclusions: Surveillance compliance improved following the 2006 guidelines. Underuse by patients with right-sided adenoma and Medicaid insurance needs research and policy

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attention, as also premature rescreening among low-risk population.

C132 A multilevel approach to accelerating the human papillomavirus (HPV) vaccine at a rural clinic for Native and non-Native youth.

Julie HT Dang¹, Duke LeTran¹, Alexandra Gori¹, Arzoo Mojadedi², Teresa Martens², Sharon McClure², Inder Wadhwa², Chester Austin², [Moon S.Chen Jr.](#)¹. ¹University of California, Davis Comprehensive Cancer Center, Sacramento, CA, USA, ²Northern Valley Indian Health, Willows, USA.

Accelerating the uptake of Human Papillomavirus (HPV) vaccinations is a priority for cancer prevention and an issue for mitigating cancer health disparities particularly among rural youth, both Native American and non-Native. The rate of HPV vaccinations for rural and Native adolescents is markedly lower than urban adolescents. Based on a Memorandum of Collaboration between the UC Davis Comprehensive Cancer Center and Northern Valley Indian Health (NVIH), a tribal health organization serving rural youth; funding from the National Cancer Institute; and the principles of community-based participatory research, we developed a multi-level approach to accelerate the HPV vaccination rates at the NVIH rural clinic in Willows, CA. Ultimately, the goal is to raise the HPV vaccination rates among patients ages 11-17 from the current 27% at this clinic to the Healthy People 2020 goal of 80%. Our presentation documents a year's relationship-building that includes the intentional input and promising data from multiple levels for launching an accelerated HPV vaccination program, exemplifying the collaboration between NVIH and a NCI Comprehensive Cancer Center. Starting with community outreach and engagement, our multiple levels included provider and staff trainings; and parent workshops. We began by surveying 12 community members on their HPV vaccination knowledge, attitudes, and behaviors and learned that they had low knowledge of the HPV vaccine and stressed the importance of educating both the community as well as parents. We followed with training of 26 clinic providers and 44 staff (participants were from all four of NVIH's medical clinics). Pre-tests were administered prior to the training and post-tests administered four months later. The training content had 3 objectives: (1) explaining the importance of HPV vaccinations and the rationale for vaccinating at ages 11-12; (2) providing an effective recommendation by clinicians; and (3) providing support to families to decide in favor of HPV vaccination. While there was attrition from pre to post tests, we achieved significant quantitative realignment of the rank order of HPV vaccination (from 3rd to most important) over other vaccinations and increased confidence in their ability to make a strong HPV vaccination recommendation

(14% and 6% respectively). Interviews from parents provided insights on their perspectives of HPV vaccination that should be incorporated. Our next steps will be to apply these findings into a multi-pronged HPV vaccination intervention program for rural Native and non-Native adolescents.

C133 Human papillomavirus vaccine recommendations for the medically underserved: A pilot study on provider communication in a safety net clinic.

[Kiran Clair](#), Melissa Perez, Patrick Penalosa, Kristine Penner, Suellen Hopfer. University of California, Irvine, Irvine, CA, USA.

Introduction The human papillomavirus (HPV) vaccine is highly effective in the prevention of cervical, vulvar, and anal cancers in women. Federally Qualified Health Centers (FQHCs) are safety-net clinics that serve a population disproportionately burdened by a lack of preventative health care services that would benefit from additional measures such as the HPV vaccine. Documenting HPV vaccine recommendations and beliefs of primary care providers in FQHCs may help in promoting evidence-based practices for vulnerable populations. **Methods** The specific aims of this study include: 1) to assess a baseline rate of HPV vaccination and counseling among women attending an FQHC clinic, and 2) to identify FQHC clinic and practitioner barriers for effective HPV vaccine recommendations. We performed a retrospective chart review of 105 women who attended an OB/GYN clinic at an FQHC in Santa Ana, CA between 1/1/2019 and 3/30/2019. Data included patient demographics, insurance type, and documentation of HPV vaccine counseling or vaccine administration. Provider data, as detailed from completion of a nationally validated HPV vaccination survey from an estimated 50 providers will also be discussed. **Results** 78% of patients self-identified as Hispanic, 14% reported Spanish as their primary language, and 86% of patients were enrolled in Medi-Cal. 25% (n = 27) of patients reviewed had documented administration of the HPV vaccine in the FQHC medical chart. Of those that had documented vaccine administration, 52% (n = 13) completed 3 doses of the vaccination program. During the study period, 11% of patient visits had documented counseling regarding the HPV vaccine, 14% had documentation of counseling within the prior 12 months of the encounter. Patients who were primarily English speaking versus Spanish were more likely to have received the HPV vaccine (29.9% vs 5.6%, p = 0.0374). Patients enrolled in Medi-Cal were more likely to receive the vaccine compared to other insurance types, including uninsured (31.5% vs 12.5%, p = 0.522). Hispanic women were less likely to have documented counseling regarding the HPV vaccine compared to non-Hispanic women

(18.4% vs 0% ($p = 0.0198$). Conclusion Overall, OB/GYN providers at an FQHC are not routinely recommending the HPV vaccine for their patients. Patients who are primarily Spanish speaking are less likely to have received counseling regarding the vaccine documented in their chart. In order to maximize the public health benefit of the HPV vaccine to prevent cervical cancer, adherence to guidelines is necessary, especially in settings that provide care to medically underserved women.

C135 Notch as an immunologic basis of cancer disparity. Anil Shanker¹, Pierre P Massion², David P Carbone³, Mikhail M Dikov³. ¹Meharry Medical College, Nashville, TN, USA, ²Vanderbilt University, Nashville, TN, USA, ³Ohio State University, Columbus, OH, USA.

Identification of the host immune factors that influence naturally occurring lymphocyte responses is an important prerequisite to successfully design a successful immunotherapeutic modality. Lymphocytes, such as T-cells and NK cells differ significantly in their ability to mediate antitumor responses depending on the genetic and immunophenotypic constitution of the individuals. The major histocompatibility and the leukocyte receptor complexes are the two most polymorphic regions of the human immune genome. Individuals with increasingly diverse repertoires of MHC class-I molecules have a greater potential for their polyclonal T cells and natural killer (NK) cells to be responsive. Our work suggested that lymphocyte repertoire varies with host backgrounds and that tumor antigen-reactive activated CD8+T cells could enhance intratumoral NK cell function. Furthermore, our data indicate that by modulating the expression of hematopoietic and dendritic cell (DC) Notch ligands, tumors negatively direct lymphocyte differentiation away from their effector phenotype. In human lung tumor infiltrates, we noted a significant correlation between Notch ligand Jag1 or Jag2-expressing dendritic cells with the programmed cell death protein PD-1-expressing CD8+T-effector-memory cells ($p = 0.0005$). PD-1 expression in T-cells signifies their exhaustion, thus diminishing their survival and antitumor function. These differences in Notch components could underlie poor prognosis in African-Americans (AA). In the clinical trial NCT00774176, the expression of mastermind-like protein-1 that affects Notch-dependent angiogenesis correlated with COPD exacerbation in AA. Also, Notch2 N-terminal-like protein (N2N) was upregulated in various carcinomas as per the TCGA database, with increased N2N expression in AA relative to Caucasians ($p = 0.0037$). N2N represses the transcriptional activities of Notch2 and Notch1 intracellular domains, which we showed

are important for antitumor T-cell function and memory. The comparative analysis of Caucasians and AA lung cancer patient tumor samples show appreciable ethnicity-specific differences in T-cell Notch parameters. Correspondingly, disparities in the expression of Notch components in ethnic minorities can affect antitumor lymphocyte immunity and impact cancer relapse.

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D001 Can small area estimates explain variation in cancer outcomes? 500 cities' tobacco use estimates and prostate cancer mortality in Philadelphia. [Ann C Klassen](#)¹, Russell McIntyre², Maxwell Boamah¹, Scott Keith², Loni Tabb¹, Charnita Ziegler-Johnson². ¹Drexel University, Philadelphia, PA, USA, ²Thomas Jefferson University, Philadelphia, PA, USA.

Background: Prostate cancer is the most common cancer in U.S. men, and racial disparities in incidence and mortality persist. Tobacco use has been associated with aggressive histologic grade and mortality; however, population-based cancer registries have limited data on lifetime tobacco use or SHS exposure. Community-level small-area estimates calculated from individual-level survey data offer a useful tool for understanding neighborhood effects, and estimating individual behaviors when direct observation is not feasible. Methods: This project used data on all 2005-2014 incident prostate cancer cases in Philadelphia, a city with high burden from both tobacco use and poverty. Using multi-level models, the odds of death from prostate cancer were estimated in relation to individual case characteristics (age, race, year of diagnosis, and tumor histologic grade) and Census tract-level estimates of tobacco use, using CDC's 500 Cities small area estimates. Mediation analyses were used to examine whether tobacco use plays a role in the relationship between race and both aggressive histologic grade and prostate cancer related mortality. Results: From 2005-2014, 6% of the 10621 cases died from prostate cancer. Cases residing in Census tracts with higher estimated proportion of adults who smoke were more likely to have aggressive grade tumors, and more likely to die from their cancer. Analyses revealed that aggressive grade partially mediated the relationship between tobacco use and cancer death, and that tobacco use partially mediated the relationship between black race and cancer death. Conclusions: Findings support the utility of small area estimates for investigating area-level influences in exploratory studies.

D002 Associations between multilevel health factors and cancer mortality according to rural residence. [Amy Trentham-Dietz](#), Noelle K LoConte, Betsy Rolland, Lisa Cadmus-Bertram, Tracy M Downs, John M Eason, Cody M Fredrick, John M Hampton, Xiao Zhang, Ronald E Gangnon. University of Wisconsin-Madison, Madison, WI, USA.

Surveillance reports consistently observe that cancer mortality rates are higher in rural than urban areas, yet data on the multi-level factors that impact rural disparities have not been fully leveraged to identify the areas of greatest need for research and policy changes. To address gaps in cancer data for rural communities, we adapted the County

Health Rankings model of the multiple determinants of health to cancer. Using publicly available data, we compared health factors and cancer mortality for rural versus urban counties in Wisconsin. Counties were defined as rural (N=19) or non-rural ("urban", N=53) based on Rural Urban Continuum Codes 7-9 and 1-6, respectively. Age-adjusted county-specific cancer mortality rates for all cancer sites combined were obtained from the state cancer registry. Health factor data were obtained from multiple sources in 4 categories: health behaviors (smoking, drinking alcohol, obesity, physical activity); clinical care (HPV vaccination; breast, cervical, and colorectal cancer screening; density of primary care physicians); socioeconomic factors (Area Deprivation Index based on 17 census items); and physical environment (access to grocery stores and alcohol outlets, air quality, pesticide use). Items were ranked for the 72 counties with lower-risk values having better ranks, e.g., higher values for screening and lower values for obesity ranked closer to 1. A composite health factor ranking was defined using County Health Rankings weights, equal to $0.3 \times (\text{behavioral factors}) + 0.2 \times (\text{clinical factors}) + 0.4 \times (\text{socioeconomic factors}) + 0.1 \times (\text{physical environment})$. Cancer death rates were higher in rural than in urban counties (181 vs 164 per 100,000). The composite health ranking was positively associated with cancer mortality rates (Pearson correlation coefficient 0.38, 95% CI 0.17-0.57), with worse rankings for rural (average 44, interquartile range, IQR 39-51) than for urban counties (average 34, IQR 25-42). The difference in health factor category rankings between rural and urban counties was greatest for socioeconomic factors (rural average rank 50 vs urban average rank 32) followed by clinical care (rural average rank 43 vs urban average rank 34) and behavioral factors (rural average rank 40 vs urban average rank 35). Physical environment factor rankings were slightly better for rural (average 33) than urban (average 37) counties. In conclusion, we confirmed that cancer mortality in Wisconsin is higher in rural as compared with urban areas. Future analyses will (a) refine the set of health factors used to construct the composite health factor ranking (e.g., account more fully for distance to care) and (b) optimize the weights applied to the categories to calculate the composite ranking. These initial findings suggest that, to increase the impact of future research and policy efforts, clinical and behavioral interventions targeting cancer health disparities in rural counties should include strategies to address socioeconomic factors.

D003 Validating a population-weighted areal interpolation method to estimate cancer rates across differing geographies.

Jenna A Khan-Gates, Robert A Winn, Katherine Y Tossas-Milligan. University of Illinois Cancer Center, Chicago, IL, USA.

Background: Access to non-census defined data responsive to the local understanding of communities (e.g. wards, parishes, or districts), is vital to addressing persistent cancer outcome disparities, drive needed resources and inform policy change. Our team previously published on the use of a population-weighted areal interpolation method to estimate ward-level cancer incidence rates using publicly available Chicago community area data. However, the accuracy of estimates produced is unknown given the lack of available data required for direct comparison. In this analysis, we validate the methodology by interpolating zip code cancer rate estimates from reported community area data and directly comparing the interpolated zip code cancer rates to the reported zip code cancer rates. Method: We applied a population-weighted areal interpolation method to estimate age-adjusted, 5-year cumulative cancer incidence rates for Chicago zip codes using Chicago community area data. Community area and zip code aggregated case counts were obtained from the Illinois State Cancer Registry for two, 5-year cumulative time periods, 2006-2010 and 2011-2015. Census bureau 2010 block-level boundaries and population data were used to create area-weighted population weights for each block or block portion intersected by zip code or community area boundaries. Block or block portion population weights were applied to community area case counts and then aggregated to the zip code level to obtain interpolated case counts. Wilcoxon signed-rank tests were used to compare interpolated zip code estimates to reported zip code cancer rates. Results: The average differences between reported and interpolated age-adjusted, 5-year cumulative incidence rates were 1.7 cases per 10,000 (SD 98.7) and 4.1 cases per 10,000 (SD 102.1) for time periods 2006-2010 and 2011-2015, respectively (n=56). Interpolated rates were not significantly different from reported rates ($p=0.06$ for 2006-2010; $p=0.13$ for 2011-2015). Of the 56 zip codes, only 5 (9.0%) and 7 (12.5%) zip codes had differences greater than 100 cases per 10,000 for each time period. These were primarily located in the downtown Chicago area, with relatively smaller areas, lower population counts, a higher percentage of non-Latino white and younger populations. Conclusions: The population-weighted areal interpolation method produced accurate estimates of zip code rates based on community area data. Though results may not be generalizable to non-urban, less densely populated areas, we propose this method as a reasonable

way to generate cancer rate estimates across alternate geographies when such data are otherwise unavailable. In our quest towards health equity, finding alternate ways to explore cancer outcomes data may reveal and allow us to address disparities potentially obscured by the constraints of existing aggregation methods.

D004 Beyond socioeconomic and racial composition: Association between neighborhood disorder and breast cancer survival.

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Background: U.S. women who identify as Black/African American (AA) or reside in socioeconomically disadvantaged neighborhoods have greater breast cancer (BrCa) mortality compared to White women or women in more affluent neighborhoods. While biologic factors – physiologic stress, epigenetics, etc. – possibly involved in these pathways are under study, few social mechanisms have been investigated. We hypothesized that neighborhood disorder (i.e., physical deterioration, lack of social control) might be a social mechanism potentiating poorer BrCa survival. Methods: Sociodemographic (age, race, ethnicity, health insurance, residential address), tumor (subtype, grade, stage), and vital status data were collected on primary, histologically-confirmed, invasive BrCa cases diagnosed among females from 2008-2013, age 20-74 years, from the New Jersey State Cancer Registry (NJSCR). Neighborhood auditing of Google Street View (GSV) scenes was conducted at 29,017 locations across NJ and neighborhood disorder scores were created from nine characteristics observed: Physical disorder (garbage/litter, graffiti, boarded/burned buildings, dumpsters, building conditions, yard conditions) and aesthetic engagement (team sports equipment, yard decorations, yard seating). Physical disorder and aesthetic engagement values were assigned to each BrCa case's residential address at diagnosis by extracting values predicted by stochastic spatial interpolation (Universal Kriging). Census-based factors were census tract socioeconomic status (Yost Index), AA segregation (Gini and Isolation indices) and % AA. Cox proportional hazard

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models estimated hazard ratios (HR) and 95% confidence intervals (CI) of BrCa-specific mortality by physical disorder and aesthetic engagement. Median BrCa diagnosis date was 01/24/2011, median GSV image date was 09/2013, and follow-up was through 12/31/2014. Results: Of 22,390 women, 70.0% were White, 12.7% were AA, 10.4% were Latina, and there were 2,040 BrCa deaths. Over two-thirds of AA and Latina women lived in high physical disorder areas compared to 43% of White women. In models adjusted for all factors listed above, hazard of BrCa mortality was 24% higher (CI: 6-45) in areas of the greatest physical disorder quartile compared to the lowest physical disorder quartile. Adjustment for physical disorder and aesthetic engagement alone reduced the non-Latino AA vs non-Latino White HR by 13% ($HR_{Crude}=2.01$, $HR_{Adj}=1.75$). Conclusions: Inequities in BrCa survival might be partially attributable to characteristics of “place” – physical disorder and aesthetics – that are beyond socioeconomic and racial composition. Future studies should collect additional data to enable robust bias investigation.

D005 Outcomes of a cancer research fellowship program for underrepresented high school students. [Ekenechukwu A Akabike](#), Alexa Azuara, Elena S Heide, Cristal Vieyra, Nicolas Villanueva, Daniel M Seible, James D Murphy. UC San Diego, San Diego, CA, USA.

Introduction: Minority populations and individuals from socioeconomically disadvantaged backgrounds suffer from high rates of cancer, yet these at-risk communities are underrepresented in the biomedical research and clinical workforce. Disparities start from an early age and stem from multiple factors, though gaps in education play a role. In the summer of 2018, University of California San Diego (UCSD) created a cancer research fellowship program for minority high school students called Outreach Program to Inspire Minority and Underrepresented Students (OPTIMUS). This report presents early outcomes of the inaugural cohort of OPTIMUS scholars. Methods: The OPTIMUS program recruits students from four underserved public high schools in southeast San Diego. Selected students (OPTIMUS scholars) are provided transportation to Moores Cancer Center at UCSD daily for a 6-week paid summer internship. Each OPTIMUS scholar is paired with a supportive cancer research lab for a mentored-lab experience. In parallel to the lab experience, scholars participate in a cancer research education curriculum, clinical shadowing, and other endeavors including college preparatory activities and social networking events. Under UCSD faculty oversight, the program is run by medical students, residents, and fellows. We surveyed students about their perceptions of different curricular elements

during the program, and again 9-months after completion of the program. Results: OPTIMUS launched in July 2018, and received 132 complete applications, with applicants self-identifying as African American (28%), Hispanic (17%), Pacific Islander (32%), multiracial (10%), and other (13%). The majority of students came from socioeconomic disadvantaged households (61%) and had parents who did not attend college (66%). Ten OPTIMUS scholars were selected for the initial program, and completed all 6-weeks of the summer fellowship. Survey results indicated that students were “very satisfied” to “mostly satisfied” with the majority of the components of the program (scoring 3 or 4 on a 4 point satisfaction scale). The 5 high school seniors in our initial OPTIMUS cohort have each received acceptance letters from 4-year universities, and each plans to major in a biology-based or health science related field. Conclusions: The OPTIMUS cancer research fellowship has generated interest among local underrepresented students, and early outcomes show promising results with students successfully transitioning into university. Long term follow up of students will help to fully understand the impact of this program, though success with OPTIMUS and other programs focusing on strengthening the educational pipeline stand to help improve diversity in the oncology workforce.

D006 Community Research Collaboration to develop a promotor-based hereditary breast cancer education program for Spanish-speaking Latinos. [Rebeca Almeida](#)¹, Alejandra Lopez-Macha¹, Tania Dugatkin¹, Ysabel Duron², Laura Fejerman¹. ¹University of California, San Francisco, CA, USA, ²The Latino Cancer Institute, San Jose, CA, USA.

Breast cancer is the most common cancer in Latinas and the leading cause of cancer death. Latinas tend to be diagnosed later, have poorer survival rates, and receive poorer quality care than white women. It has been well documented that women at high risk for hereditary breast cancer (women with strong family history, or BRCA1 or BRCA2 carriers) greatly benefit from genetic counseling, which enhances early cancer detection or risk-reduction strategies. Despite the growing availability of genetic counseling and testing for hereditary breast cancer, awareness and use of these services is low among Latinas. We developed a comprehensive, culturally-appropriate set of materials for a community health educator (promotor)-led hereditary breast cancer educational program for the Latino community. The conceptual framework used to design didactic curriculum and the program structure was based on the construct of “relational culture.” Materials were developed through an iterative process that involved exposure of the target

populations to draft materials, discussion, and modification of materials. The focus groups took place in the cities of San Francisco, San Jose, Concord and Pittsburg between March 2018 and May 2019. We conducted 7 focus groups, including a total of 68 women (35 promotores, and 33 community members). On average, participants were 43 years old (SD= 11.62), and had been living in the U.S. for 16 years (SD= 7.55). Approximately eighty percent of the sample had limited English proficiency, fifty-one percent had public insurance, and forty-nine percent had a high school education. Sixty percent of them were unemployed, and seventy-two percent were born in Mexico. The conversation during the focus group sessions was directed towards hereditary breast cancer baseline knowledge, perceptions and learning preferences among Spanish-speaking Latino participants. A thematic analysis of the focus groups yielded five main themes: barriers, importance, dissemination, educational, and culture. 1) Barriers referred to the program's ability to overcome traditional barriers to healthcare for Latinos; 2) Importance related to the significance of the program's content; 3) Dissemination referred to the easiness and value of disseminating the information covered in the program; 4) Educational related to the program's informational nature; and 5) culture referred to the program being perceived as culturally-appropriate. Results revealed that participants thought the materials were easy to understand, attractive, and engaging. They believed that the content would be easy to disseminate and important to the community. However, given that the materials encompassed genetics content, some promotores and community members expressed confusion, and feeling overwhelmed. To address this, materials were simplified, and additional didactic content was included. Future research is needed to determine the impact of the educational program on genetic counseling and screening behavior.

D007 Mammographic breast density and acculturation: Longitudinal analysis in Chinese immigrants. [Rebeca Almeida](#)¹, [Celia Byrne](#)², [Carolyn Y. Fang](#)³, [Marilyn Tseng](#)¹. ¹California Polytechnic State University, San Luis Obispo, CA, USA, ²Uniformed Services University of the Health Sciences, Bethesda, MD, USA, ³Fox Chase Cancer Center, Philadelphia, PA, USA.

Breast cancer is the most common cancer in women, regardless of race or ethnicity. Unlike other racial and ethnic groups, breast cancer rates in Asian American women have steadily increased over the past several decades. The increase among recent migrants might be partly due to the adoption of the behaviors and values of the mainstream culture. We

tested the hypothesis that higher level of acculturation was associated with higher mammographic breast density (MBD), an indicator of breast cancer risk, using data from a 2006-2010 longitudinal study of 426 premenopausal Chinese immigrant women in Philadelphia. MBD, including dense area, non-dense area, and percent density, was calculated using a computer assisted method. An abridged version of the General Ethnicity Questionnaire – American version provided a measure of acculturation. We used generalized estimating equations (GEE) to account for repeated observations and adjusted for age, type of mammographic image (film or digital), body mass index, months of breastfeeding, number of live births, age at first birth, and menopausal stage (pre, early peri, late peri, and post). At baseline, the mean age of participants was 43.9 years (SD=4.5), mean length of U.S. residence was 7.5 years (SD=4.8), and mean age at migration was 36.4 years (SD=6.4). GEE models using 1,110 observations from the 426 participants showed no significant associations between acculturation and MBD (percent density $\beta=0.32$, $p=0.54$; dense area $\beta=0.28$, $p=0.57$; and non-dense area $\beta=-0.42$, $p=0.60$). Our findings are consistent with an emerging body of research suggesting that acculturation measures are insufficient to distinguish levels of breast cancer risk in immigrant women, given changes in immigration patterns and economic development in sending countries. Future work should consider other factors, including behavioral, environmental and epigenetic factors or changes in reproductive patterns, that may have a greater effect on MBD than acculturation-related behaviors in adulthood.

D008 Resolving disparities in cancer patient outcomes in Trinidad and Tobago. [Nalisha Monroe](#). Caribbean Cancer Research Initiative, Santa Cruz, St. George, Trinidad.

The Caribbean Cancer Research Initiative (CCRI) began as a result of the alarming rates of various cancer types in the Caribbean and the lack of data and credible sources of information on the prevalence of cancer in the region. What we do know is that Trinidad and Tobago has one of the highest cancer mortality rates in the Caribbean. Some explanations for this disparity can be lack of treatment innovation, educational gaps regarding screening, shortcomings in health care administration and cultural biases. Preliminary data indicates that Trinidad has one of the highest breast cancer mortality rates in the Americas. The five year breast cancer survival rate is at approximately 30% compared to over 90% in the US. The median time to diagnostic resolution based on preliminary research is 65 days, approximately 3 times what is it in US and Canada. CCRI's mission is to build the cancer research capacity in the

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Caribbean starting in Trinidad which will aid in preventing more cancers and improving patient outcomes in the Caribbean. One of the main programs of the organization is the patient navigation service which is designed to meet the needs of persons diagnosed with cancer and their family members. This service has highlighted some of the contributing factors to cancer disparities in Trinidad. Examples of these that will be featured on this poster are socioeconomic factors, cultural phenomenon, geographical factors and poor access to proper care. The Caribbean Cancer Research Initiative is committed to assist patients to overcome their barriers to gain better outcomes, which will aid in resolving disparities in cancer health in Trinidad.

D009 Racial/ethnic disparities in knowledge of human papilloma virus (HPV) and the HPV vaccine among individuals with a regular healthcare provider: Results from the Health Information National Trends Survey, United States, 2017-2018. *Jane Montealegre*². ¹University of Texas Health Science Center at Houston School of Public Health, Houston, Texas, USA, ²Dan L Duncan Comprehensive Cancer Center, Baylor College of Medicine (BCM); Department of Pediatrics, BCM, Houston, TX, USA.

Introduction: Racial/ethnic (R/E) minorities have been shown to have lower knowledge of Human Papillomavirus (HPV) and the HPV vaccine when compared to R/E majorities. They are also less likely to have a regular healthcare provider (HCP). Given that having a regular HCP is associated with higher knowledge of HPV, the HPV vaccine, and higher vaccine completion rates, we sought to evaluate whether R/E disparities in HPV knowledge are attenuated among individuals with a regular HCP. Methods: Weighted data from the Health Information National Trends Survey (HINTS) 5 cycle 1 and 2 (2017-2018) were analyzed using SAS Version 9.4. Self-reported race/ethnicity was used to categorize participants as R/E minority (Black/African American, Hispanic, and Other) or majority (White). Wald chi-square tests were performed to assess the association between R/E minority status and knowledge of HPV and the HPV vaccine. Multivariate logistic regression was used to assess these associations after controlling for pertinent sociodemographic factors (gender, age, education, income, health insurance, geographic area, census region, ever having cancer, and use of the internet). The same associations were assessed in stratified analyses comparing those with and without a regular HCP. Results: Overall, knowledge of HPV and the HPV vaccine was significantly lower among minorities than among majorities (57.62% and 52.51% vs 65.39% and 66.38%). A lower percentage of minorities reported having

a regular HCP (52.20%) when compared to majorities (72.71%). While knowledge of HPV and the HPV vaccine was generally higher among individuals with a regular HCP (62.94% compared to 57.84% among those without a regular HCP), differences by R/E status persisted. Specifically, a lower proportion of minorities with a regular HCP had ever heard of HPV (61.40%) or the HPV vaccine (55.14%), when compared to majorities (67% and 67.89%, respectively). In multivariate analyses, minorities had a 35% lower odds of having heard of HPV (odds ratio [OR] = 0.65, confidence interval [CI] = 0.50 - 0.84) and a 45% lower odds of having heard of the HPV vaccine (OR = 0.55, CI = 0.42 - 0.73) when compared to majorities after adjusting for sociodemographic factors. Furthermore, among individuals with a regular HCP, minorities had a 37% (OR = 0.63, CI = 0.48 - 0.83) lower odds of having heard of HPV and a 49% (OR = 0.51, CI = 0.39 - 0.68) lower odds of having heard of the HPV vaccine when compared to majorities after adjusting for sociodemographic factors. Conclusion: These analyses show that R/E minority groups have disparately lower knowledge of HPV and the HPV vaccine when compared to the R/E majority group. Additionally, minorities who had a regular HCP still reported significantly lower levels of HPV and HPV vaccine knowledge than their majority counterparts. These analyses suggest the need to address disparities in health information and strengthen provider-patient communication regarding HPV and the HPV vaccine.

D010 Developing an inflammatory breast cancer campaign: Results from focus groups led by Komen scholars. *Portia L Andrews*¹, Alanna Burwell¹, Maria S Dixon¹, Hamzah Kharabsheh¹, Dana M Gant¹, Tia A Tate¹, Hassan Shehata¹, Jodie M Fleming¹, Kearston L Ingraham², Seronda A Robinson¹, Nadine J Barrett², Kevin P Williams¹. ¹North Carolina Central University, Durham, NC, USA, ²Duke University Medical Center, Durham, NC, USA.

Introduction: Breast cancer (BC) remains the second leading cause of cancer deaths amongst women worldwide. In the United States, African American and Latino women are disproportionately burdened by the incidence and mortality of BC compared with Caucasian women. Inflammatory breast cancer (IBC) is a rare and aggressive form of BC. African American women are more likely to be diagnosed with IBC and at earlier age compared to whites. IBC frequently lacks a breast lump and hence is difficult to detect. IBC is often diagnosed late at stage III or IV and has worse prognosis than non-IBC BC. Critically, awareness of IBC continues to lag education on other breast cancers. Lifesaving information and resources to reduce cancer risks are not widespread

amongst minority populations. Community engagement is a valuable asset that enhances the traditional biomedical scientist's knowledge in understanding the connection between biological and social factors affecting a particular disease, with the goal of addressing, and ultimately diminishing, BC health disparities. Methods: The purpose of the focus groups were to determine the best methods and messages for community outreach to raise awareness about IBC. To follow up on our initial listening session at the 4th Annual Women's Health Awareness Day at NCCU, several focus groups were engaged, each with 10-12 participants from various gender, racial, and economic demographics, recruited from the Raleigh and Durham communities. Participants were provided informed consent forms and demographic surveys to complete. With guidance and training from the Komen mentoring team, trainees crafted a marketing plan and focus group session guide. Trainees served as session moderators and note-takers and developed summary reports which highlighted themes from the sessions which included the following topics: knowledge of IBC, best methods for sharing health information, types of messages to raise awareness and promote action, and perceived barriers to breast cancer screening. Results: Information gathered from the focus group sessions provides a unique perspective to strategize and develop marketing campaigns to bring awareness to the community and minority populations in the community. Many participants were unfamiliar with IBC, how it is diagnosed, and treatment options. To better raise awareness about IBC, participants recommended the use of various social media platforms, promoting more one-on-one education, patient self-advocacy sessions, and changing the perception of the presence of lumps as an indicator of BC. Conclusion: Cancer incidence and mortality overall are declining in all groups in the United States; however, minority groups continue to suffer with increased risk of developing or dying from BC. Furthermore, there is a significant need to raise awareness and understanding of IBC in diverse communities. Partnerships between the community and researchers will facilitate the development of relevant and accessible information about IBC.

D011 Assessing a toolkit and training community health workers to increase colorectal cancer screening rates among Hispanics in New Mexico. [Lila Baca](#)¹, Karen Quezada¹, Miria Kano¹, Hailey Heinz, MA², Joesph Rodman, MA¹, Tawny W. Boyce, MS, MPH¹, Dolores D. Guest, PhD, RD¹. ¹University of New Mexico Comprehensive Cancer Center, Albuquerque, NM, United States, ²University of New Mexico Cradle to Career Policy Institute, Albuquerque, NM, United States.

Rationale: Colorectal cancer (CRC) is the second leading cause of cancer mortality in the US and the fourth most frequently diagnosed cancer in New Mexico (NM). CRC is the fourth most common cause of death among Hispanics in NM. NM Hispanics are more likely than non-Hispanic whites to be diagnosed with later stage CRC (71% vs 50%). Due to NM's diverse geography and culture, combined with a statewide shortage of medical professionals, community health workers (CHWs) serve as a critical link to health information in local communities. Funded by the National Cancer Institute's Center to Reduce Cancer Health Disparities (CRCHD), the National Outreach Network (NON) Community Health Educator (CHE) program supports direct community outreach and adapts and tests educational initiatives. We describe one such initiative here. We used the RE-AIM framework to develop a CRC-focused training and toolkit for CHWs to apply in their work. The goal of this study is to assess the effectiveness and suitability of these materials. A sub-analysis explored barriers and facilitators to toolkit implementation and CRC screening interventions in predominantly monolingual Spanish-speaking communities. Approaches: We finalized the toolkit and training through a multi-year process that incorporated community and stakeholder input. The 3-hour in-person training focused on CRC risk, screening, and prevention, and included modules on anatomy, screening methods, and barriers to screening. A subset of CHWs completed semi-structured interviews at follow-up to provide insight into practical toolkit use. We used descriptive statistics to assess participant demographics. We used paired t-tests to assess mean changes in pre/ post-training survey data in knowledge and confidence. Results: We enrolled 79 CHWs (female: 89.9%, Hispanic: 94.9%) with median CHW experience 7 years (IQR: 3,15). 59.5% reported their patients prefer speaking Spanish, 29.1% prefer English, and 11.4% prefer both equally or another language. 30.4% of CHWs report their own preference for Spanish, 45.6% prefer English, 22.8% are equally comfortable with both, and 1.3% other language. Initial analyses show improvement for knowledge (mean 16.9%; 95%CI: 13.9, 19.9; $p < .001$), and confidence on a 1-5 point scale where 5 is extreme confidence (mean 1.6 points; 95%CI: 1.3, 1.8; $p < .001$). All participants agreed the training will help navigate barriers related to CRC screenings, while a majority said the trainings fit with their work (89.7%), they will use the knowledge and skills (97.4%), and the toolkit will make them a more effective team member (98.7%). Qualitative data additionally support known or suspected barriers to screening for monolingual Spanish speakers. Conclusion: While the training appears effective at increasing CRC knowledge, changes in confidence and beliefs are less clear. Educating CHWs and providing them with appropriate materials addresses some

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gaps to improve CRC screening rates; however, other barriers to screening among NM Hispanics remain.

D012 Using geographic information systems mapping to target a cancer prevention theater outreach program to the medically underserved. Betsy Escobar, Abiodun Oluyomi, Ivan Valverde, Jane Montealegre, Maria Jibaja-Weiss. Dan L Duncan Comprehensive Cancer Center at Baylor College of Medicine, Houston, TX, USA.

Introduction: Breast (BC), Colorectal (CRC), Cervical (CXC) cancers are preventable through early detection. However, these cancer rates remain higher among medically underserved minority populations. Disparities in knowledge and awareness of screening contribute to the increased cancer burden. Group and one-on-one education are evidence-based strategies to promote screening test utilization in these communities. We created an innovative Theater Outreach Program (TOP) to disseminate educational messages in a linguistically and culturally sensitive way to engage minority medically underserved populations. Through the TOP, researchers and clinicians work with local playwrights and actors to develop culturally and linguistically appropriate monologues for African American, Hispanic, and Vietnamese communities. Since the inception of the TOP, we performed monologues in medically underserved areas with a high incidence of relevant cancer throughout our catchment area, Harris County. However, geographic data on screening behaviors may be effective in fine-tuning delivery of our monologues. Methods: Using Esri's ArcMap 10.4 (Esri, Redlands, CA), we geo-processed cancer screening data at the census tract level. We retrieved data on mammography use, Papanicolaou smear use, fecal occult blood test, sigmoidoscopy, or colonoscopy use from the 500 Cities Project. For our GIS analysis, we first geocoded the locations of all the TOP monologues performed from January 2012-July 2018 (n=260). Using the 500CP 2016 data, we created choropleth maps displaying the percent of the eligible population screened for BC, CRC, and CXC cancer in county census tracts. The percent of screened data were classified into five categories based on the "Natural Breaks Classification" method in ArcGIS. For visualization, we overlaid the TOP geocoded locations "points" on top of the screening prevalence choropleth maps, where each census tract is represented as a "polygon" allowing us to show where the census tract polygons contained the TOP points. Results: BC, CXC and CRC screening rates vary widely across census tracts in Houston. Overall, we presented TOP monologues in areas with the lowest prevalence of screening test utilization. However, there are notable areas (e.g., in the

far east quadrant of the city) where TOP monologues have not been presented despite having the lowest screening rates. Conclusion: The yield of GIS maps that we obtained is a robust framework that will help us to monitor diseases in medically underserved minority populations and the use of screening services. These maps enabled us to gain insight into the medical needs and screening services utilization within our catchment area. We will strategically target regions in most need of our cancer prevention performances and linkage to screening services to close the gap of cancer health disparities among minorities.

D013 EHE Foundation. Medha Deoras-Sutliff. EHE Foundation, Newark, OH, USA.

The EHE Foundation leads the global fight against this rare vascular cancer, considered a sarcoma sub-type. Our mission is to seek treatments and a cure for Epithelioid Hemangioendothelioma (EHE) by increasing awareness, pursuing scientific research, advocating for and supporting EHE patients, and bridging information between researchers, providers and patients. Developing and funding a comprehensive and scientifically rational research strategy is a priority. Connecting to partners and constituents in the sarcoma community but also world-wide through sister charities in Canada, UK and Australia helps streamline and focus research and patient support efforts. Alone we are Rare, Together we are Stronger.

D014 Assessing an intervention to increase cervical cancer knowledge and HPV vaccination knowledge among predominantly African American communities in South Carolina. Marvella E Ford¹, Kimberly Cannady¹, NiAsia Hazelton², Kendrea D Knight¹, Claudia Lawton¹, Angela M Malek¹, Judith D Salley³. ¹Medical University of South Carolina, Charleston, SC, USA, ²University of South Carolina, Columbia, SC, USA, ³South Carolina State University, Orangeburg, SC, USA.

BACKGROUND: Human papilloma virus (HPV) is linked to cervical cancer incidence. The HPV vaccine has been shown to significantly reduce the risk of HPV infection and subsequent cervical cancer diagnosis. Unfortunately, African Americans (AA) show lower uptake of the HPV vaccine than other groups. Underuse of the HPV vaccine has been linked to lack of knowledge of its effectiveness in preventing cervical cancer. OBJECTIVES: The purpose of this study was to evaluate an educational intervention to improve cervical cancer knowledge and HPV vaccine knowledge among predominantly AA communities in

South Carolina (SC). **METHODS:** The study was conducted in a convenience sample of residents of five SC counties with high racial disparities in cervical cancer mortality rates that were recruited by community partners. The intervention consisted of a 4.5-hour educational session with 8 different components including a 30-minute cervical cancer/HPV vaccination knowledge component. Pre- and post- intervention surveys were administered. **MEASURES:** A 7-item investigator-developed instrument was used to evaluate pre-/post-intervention changes in cervical cancer knowledge and HPV vaccination knowledge. The items were based on the investigators' review of the contemporary literature on the topics of cervical cancer, HPV infection, and the HPV vaccine. **RESULTS:** The first sample consisted of 64 participants from last year and this year participants consisted of 28 which make 92 in all (99% AA). Most of the participants who reported age were 50+ years. Among those who reported gender, 90% were female. Among those who reported income, 80% had an annual household income >\$40,000. Seventy-two percent of the participants who reported their educational level had received at least some college training. **Conclusions:** Providing cervical cancer and HPV vaccination information leads to increasing knowledge related to cervical cancer and the HPV vaccine. In the future study, the investigators will evaluate changes in the pre-/post-intervention. HPV vaccination uptake rates in the five counties where the intervention was conducted.

D015 A Hispanic community's evaluation of the culturally adapted Conexiones program: An inductive analysis of focus groups. Isela Garcia, Clara Reyes, Rebecca Palacios. NMSU, Las Cruces, NM, USA.

Purpose: This study examined the priority population's evaluation of the Conexiones program's cognitive and cultural appropriateness for use with Hispanic mothers. **Introduction:** When programs lack cultural relevance, there is a lost opportunity to engage ethnic minorities in services that can help combat health disparities. Priority populations should be included in cultural adaptation processes to address cultural mismatches between program validation groups (e.g. Non-Hispanic White) and new consumer groups (e.g. Hispanics). No education programs are designed to help Hispanic mothers diagnosed with cancer manage the impact of their diagnosis on their school-aged children. An evidence-based cancer-parenting program was culturally-adapted to create the Conexiones program for cancer-diagnosed Hispanic mothers. In this study, Hispanic mothers evaluated the adapted Conexiones program for cognitive and cultural appropriateness. **Methods:** A series of questions guided

focus groups of Hispanic mothers in assessing cognitive (e.g., wording, sequencing) and cultural components of the Conexiones materials. Focus groups were audiorecorded and transcribed. Transcriptions were analyzed using inductive content analysis. Trustworthiness was protected by coding to consensus, systematic peer debriefing, and maintenance of an audit trail. **Results:** Participants described four domains for improving the Conexiones educational materials: Softening the Language, Incorrect Translation, Finding the Right Words, and Not Making Assumptions. Softening the Language captured the participant's desire for greater empathy and a warmer and more conversational tone in the patient educator script. Incorrect Translation identified literal translation from English to Spanish that failed to capture the intended meaning of the program text. Poor grammar, lack of context, and misinterpretation also resulted in comprehension problems. Finding the Right Words consisted of suggestions participants made to replace words or reorder phrases to make the text consistent, less repetitive, and reflect language used in the border region. Not Making Assumptions included participants' warning against making presumptions about the priority population (e.g. that patients will have social support from other adults). In addition to these recommendations, participants highlighted cultural and regional considerations for the program and shared positive feedback on the program content. **Conclusion:** The priority population's evaluation of Conexiones after its initial adaptation helped to further refine the program and ensure it fit the needs and beliefs of the new consumer group, Hispanics. Such efforts are important to making evidence-based programs culturally acceptable and appealing to Hispanics. Inclusion of priority populations in the adaptation process ultimately helps develop an optimal program that can be more engaging and beneficial.

D016 Colorectal cancer education among ethnic minority populations. Mayra Serrano, Kimlin Ashing, Alejandro Fernandez, Katty Nerio, Marisela Garcia. City of Hope, Duarte, CA, USA.

Colorectal cancer (CRC) is the second leading cause of cancer death in the United States. Although the disease is primarily found among older adults, racial/ethnic minorities are disproportionately affected by CRC. Most CRC deaths can be prevented through early screening; yet, in most states, less than 20% of racial and ethnic minorities report having had a blood stool test within the past year. The Center to Reduce Cancer Health Disparities (CRCHD) launched the Screen to Save (S2S): NCI Colorectal Cancer Outreach and Screening Initiative to increase CRC screening rates among

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racially and ethnically diverse and rural communities across the nation. City of Hope community health educators (CHEs) worked with community, clinical, and academic partners to conduct CRC educational workshops (via PowerPoint/Flipchart) and outreach activities, and promoted screening tools, such as FIT kits, among racially and ethnically diverse populations. We administered NCI developed pre/post surveys that assessed any changes in CRC knowledge and intention to screen. A total of 134 persons received the S2S education. Most (66%) were age 50 or older; 84% were female; and 62% self-reported as Hispanics/Latinos; 14% African-American. Most (52%) preferred Spanish, 44% had less than a high school education, and 17% of had no insurance. Most (79%) of participants age 50 or older have been previously screened for colorectal cancer. Results show statistically significant increases in knowledge about colon cancer risk and prevention practices with all groups showing an increase in scores across the two time periods ($Z=-7.843$; $p<.000$). After participating in one of the S2S events ($n=108$) 97% of participants agreed that they were more likely to talk to their health providers about CRC screening, 96% to get screened for CRC, 96% to talk to their family or friends about CRC, 95.5% to eat healthier, and 94.5% to increase physical activity. Our findings suggest that educational workshops are effective at increasing knowledge in ethnic minority populations. Although participants are knowledgeable about the risks of CRC, there needs to be more navigation and education in follow-up with participants to submit FIT Kits. In addition, intention to screen is high among our population, therefore more needs to be done in healthcare settings to follow-up with participants regarding their interest in screening. Healthcare access and coverage resources and referrals need to be provided to participants without a medical home or who are uninsured. These healthcare resources can include FQHCs and community clinics, where medically underserved and vulnerable community members can obtain low to no cost care.

D017 Leveraging service learning to promote cancer health education in Milwaukee public high schools. [Kathleen Jensik¹](#), [Dakota Berg²](#), [Melinda Stolley¹](#). ¹Medical College of Wisconsin, Milwaukee, WI, USA, ²Milwaukee Public Schools, Milwaukee, WI USA.

Background: Cancer is the leading cause of death in Wisconsin with notably higher rates of cancer incidence, late stage incidence and mortality noted for Milwaukee and among racial/ethnic minorities living in Milwaukee. Based on results from community-based focus groups on potential solutions to cancer disparities, along with evidence from

multiple national studies of key contributors to cancer disparities, we developed a cancer education program to inform Milwaukee youth about cancer. As such, we partnered with the Milwaukee Public Schools (MPS) to develop and pilot a cancer health education curriculum. The study examines the impact of the cancer health education curriculum (CHEC) in cancer-related knowledge, fear and fatalism and behaviors. The curriculum was integrated with a Service Learning component to provide a deeper reach and depth of educational efforts. Methods: The 4-week curriculum developed with a health education teacher is integrated into the required health education course and leverages the school's service requirement. The curriculum includes: one week of interactive learning sessions (basic cancer biology; cancer risk factors; social determinants of health and cancer disparities; screening, early detection, treatment). During weeks 2-4, students work in small groups to research a particular topic of their choice (i.e., breast cancer screening, nutrition and cancer) creating an informative brochure as well as an interactive activity to teach others about their particular topic. The curriculum culminates in a school wide cancer health fair for students, family and community members fulfilling the students' mandatory service-learning requirement for the year. Students complete measures of cancer knowledge, fear and fatalism, and modifiable risk behaviors pre and post-curriculum. Results: Since 2015, over 700 students at MHS have received the curriculum and over 800 family and community members have attended the cancer health fairs. In the third year of the curriculum, we began to collect data on cancer knowledge, cancer fear and fatalism and modifiable risk behaviors. Results indicate: 1) a significant improvement in cancer knowledge ($n=265$, $p<0.001$), 2) a significant decrease in cancer fear and fatalism ($p<0.001$), 3) a significant increase in fruit consumption ($p<0.005$), 4) a decrease in screen time ($p<0.01$), 5) a decrease in tobacco use ($p<0.05$), 6) an increase in how often students spoke with their family about health in issues in general ($p<0.05$) and about cancer ($p<0.0001$). Qualitative data from the students reflect important gains such as an interest in sharing their new knowledge about cancer with their community and a sense of empowerment that they can do something to prevent cancer. Conclusions: Providing cancer health education within an existing health education class and leveraging the service-learning requirement to provide students with the opportunity to teach others, leads to notable changes in high school students.

D018 Dietary and cultural practices of minorities in New York City as an indicator of colorectal cancer screening behavior and screening intent. [Cicely K. Johnson](#). Hunter College - Center for Cancer Health Disparities Research, New York, NY, USA.

There are significant racial and gender disparities in health behaviors and health outcomes in the United States, and these differences are vast and not well understood. As colorectal cancer is the third most common cancer diagnosed in both men and women in the United States, and African Americans have the highest colorectal cancer incidence and mortality rates of all racial groups in the U.S., it is essential to ascertain the interplay between individual health behaviors that may be unique racial patterns, and health outcomes. This research study is a pilot study that is a part of a larger study with existing preliminary data on the intersection between diet and colorectal cancer. This pilot study examines dietary habits and practices of individuals identifying as Black as a predictor for colorectal cancer screening. This study will assess the relationship between dietary habits and screening behavior and intent. This study will evaluate the correlation between individuals with a higher intake of healthy options and their intent to screen for colorectal cancer within a year. The novelty of this study is rooted in its utilization of a study sample that includes participants who are not currently age eligible for screening according to the new recommended guidelines, but will be age eligible within the next five years, utilization of a novel variable such as dietary habits to correlate with screening behavior and intent, extracting differences by gender, and extracting differences by ethnicity. Future work of this study will be concerned with gathering qualitative data around the interrelationship of culture and diet as it pertains to screening behavior and intent, and the multiple variations of that interrelationship by ethnicity. Results of this significant study can provide health educators, providers and policy makers information that is critically necessary in an effort to create culturally relevant health promotion materials within the diverse Black community.

D019 SGM Cancer CARE: Creating a health workforce trained to conduct sexual and gender minority (SGM) affirmative research from prevention to survivorship. [Miria Kano](#)¹, [Dominique Jasperse](#)¹, [Irene Tami-Murray](#)², [Yen Nhi Pham](#)², [Nelson Sanchez](#)³, [Shine Chang](#)². ¹University of New Mexico, Albuquerque, NM, USA, ²University of Texas, The MD Anderson Cancer Center, Houston, TX, USA, ³Memorial Sloan Kettering, New York, NY, USA.

Background: A health workforce trained to conduct SGM-inclusive cancer research is needed for SGM persons seeking

comprehensive cancer care including prevention, screening, treatment, and survivorship. Research on SGM cancer care has described many disparities, and a number of studies of SGM individuals have documented increased exposure to cancer-risk factors and certain cancers, as well as poorer cancer outcomes. Yet SGM patients are extremely diverse, presenting with unique and varied care needs. Although research on SGM groups has grown, gaps persist in the knowledge of specific SGM cancer risk factors and treatment experiences that are critical for developing evidence-based oncology care guidelines across the cancer care continuum. As no nationally available resource routinely trains and prepares the oncology/biomedical workforce for SGM cancer research, we were recently awarded, a National Cancer Institute 1R25CA240113=01 (Chang and Sanchez PIs), SGM Cancer CARE (Sexual and Gender Minority Cancer: Curricular Advances for Research and Education), to design an up-to-date, competency-based interactive 2-day workshop for early career researchers. We will present results from the needs assessment of researcher and oncology provider needs for SGM cancer research training, clinical care, and health care advocacy that supported our application. Approaches: We distributed an electronic survey containing 32 questions to determine health and research professional interest in, and need for, SGM specific cancer training and education through several professional organization list serves including the LGBTQ Workforce Conference and the Geographic Management of Cancer Health Disparities Program (GMAp). Results: Respondents (n=138) worked predominantly in academic medical centers and public health/government, as researchers (54.62%), clinicians (14.62%), educators (22.31%), and administrators (7.69%). They identified 3 key priorities for improving SGM cancer health research: 1) Increased knowledge of SGM cancer research priorities (3.99 Mean, SD 1.22); 2) Updates on current SGM cancer literature (5.61 Mean, SD 1.45); and 3) Assistance building advisory committees of relevant stakeholders to ensure design and conduct of culturally competent SGM cancer and cancer health disparities research (5.64 Mean, SD 1.40). Importantly, 90.6% lacked sufficient resources for travel to attend SGM cancer research training opportunities, indicating desires for web-based education or blending learning modalities. Conclusion: Findings from our needs assessment suggest that the SGM Cancer CARE curriculum in development is responsive to the needs of health and research professionals. Intended for presentation in a 1.5 day pilot workshop, however, financial constraints may necessitate designing flexible learning formats in order to reach an array of professionals and stimulate learning, thereby increasing SGM cancer research leading to more equitable health for vulnerable SGM populations.

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D020 Addressing the needs of Cedars-Sinai Cancer's catchment area: Cancer screening compliance among the Korean community in Los Angeles. [Dong Hee Kim](#), Yu-Chen Lin, Christie Y. Jeon, Laurel Finster, A. Joan Levine, [Zul Surani](#), Robert W. Haile. Research Center for Health Equity, Samuel Oschin Comprehensive Cancer Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA.

Background: Breast cancer screening rates among Korean American women lag behind other populations in the US; additionally, this population has the lowest mammography adherence rates of all the Asian subgroups. The rates of invasive breast cancer among Korean women in Los Angeles County (LAC) have also increased dramatically, which leads to poor outcomes. Early detection of breast cancer provides a greater range of treatment options and often better survival rates. Given this, we want to understand the unique barriers that Korean women in LAC face in order to adequately serve our catchment area. Methods: To understand the context of cancer screening compliance among Koreans in LAC, the Research Center for Health Equity (RCHE) at Cedars-Sinai Medical Center conducted a culturally adapted survey within its catchment area. We developed a Cancer and Healthcare in Los Angeles Survey (CHILAS) with feedback from Korean community leaders. The survey targeting females has 31 questions and covers screening behavior, medical history, and health care access. The survey was adapted with feedback from Korean community leaders and printed in the Korean language. A free cancer education workshop was offered post survey. For the purposes of the current analyses, we focused on participants were Korean women ≥ 18 yrs who reside in LAC. Surveys were administered at seven different faith-based venues, such as churches and Buddhist temples, during a three-month period. Results: 126 female participants were age eligible (age 45 and above) to answer the mammography screening cancer question and 52 (41.3%) of them had their screening up to date. 113 participants answered both the question about mammography screening and knowing someone with cancer. Of those who 'knew someone with cancer' (N=75), 46% had their screening up to date (N=35). Of those who 'did not know someone with cancer' (N=38), 34% had their screening up to date (N=13), the difference was not significant (p -value =0.21). Two of the top reasons for not getting screened were 1) not feeling sick and 2) no health insurance. Moreover, speaking the same language as the primary provider, financial status, length of waiting for an appointment, and transportation were not associated with breast cancer screening. Although mammography rates were low, colonoscopy rates among age eligible participants in the survey were very high (94.5%), leading us to believe there are unique factors to low

mammography screening in Korean women. Future direction: To our knowledge, there are no existing awareness programs to increase mammography screening for this population. We know that faith-based organizations can increase screening behaviors among parishioners and can be an effective avenue for improving health outcomes. Through the engagement with elders, RCHE has formed an extensive network of partnerships with faith-based organizations we will identify the unique barriers to mammography compliance in Korean Americans.

D021 Chinese E-Women Project: A community-based approach to improving breast cancer knowledge among Chinese American women. [Alice W Lee](#)¹, Cindy Puga¹, Michelle Tsai², Sherry Huang². ¹California State University, Fullerton, Fullerton, CA, USA, ²Orange County Herald Center, Irvine, CA, USA.

Background: Breast cancer is the most common cancer for Chinese women living in the United States (U.S.). Despite overall rates being significantly lower than other races and ethnicities, incidence has steadily increased over the last few decades. This is concerning given that Asian Americans are the fastest growing racial group in the U.S. and Chinese Americans constitute the largest Asian American ethnic population. In addition, mammography screening rates are low among Chinese American women, and this may be attributable to a lack of breast cancer knowledge and awareness. Methods: The Chinese E-Women Project (CEWP) is a breast health education and engagement program developed by the Orange County Herald Center (OCHC), a non-profit organization that serves the Chinese American community in Orange County, California. Two key CEWP components are the Community Gatekeeper Education Session (CGES), which is a formal education session led by trained OCHC staff to engage and educate Chinese American community leaders, and the E-Women Tea Time (EWTT), which is an informal peer group education session led by a past CGES participant. All CGES and EWTT events presented information on breast cancer epidemiology, biology, and screening. Questionnaires testing breast cancer knowledge were administered before and after the education session at each event. We pooled data across the CGES and EWTT events separately and used Wilcoxon signed rank test to evaluate change in participants' overall knowledge. We also examined change in knowledge by question using McNemar's test. Results: Our analysis included a total of 94 CGES and 149 EWTT female participants. For both CGES and EWTT, we observed significant improvements in overall breast cancer knowledge after the education session (both

$p < 0.0001$). Although we did identify one question related to mammography and another question related to personal breast health that did not show significant improvement after the session, knowledge for all other questions significantly improved (all $p < 0.05$). Conclusions: These findings highlight community-based education sessions as effective ways of both informing Chinese American women about breast cancer and engaging them to become advocates of breast health wellness in their community. Future research should evaluate whether these types of sessions can lead to positive individual changes in behavior and screening practice.

D022 A novel strategy to assess impact of community outreach and education activities for Hispanic communities:

The preliminary results of the CONTINUAR protocol. Jomar Lopez¹, Jennifer Garcia¹, Cynthia Cortes², McKenzie McIntyre¹, Laura Moreno¹, Jessica McIntyre¹, Steven K Sutton¹, Eida Castro², Julio Jimenez², Clement K Gwede¹, Susan T Vadaparampil¹. ¹Moffitt Cancer Center & Research Institute, Tampa, Florida, USA, ²Ponce Health Sciences University, Ponce, Puerto Rico, USA.

Introduction: Cancer is a leading cause of death among Hispanic/Latinos (H/L) in the United States and Puerto Rico. Educational interventions to improve health behavior uptake and adherence for primary and secondary prevention could reduce disparities among H/L. While there has been an investment of time and resources to implement health education programs to reach H/L in diverse community settings, little is known about their intermediate outcomes and long-term behavioral impact. Innovative and systematic tracking of event participants can address the gap in knowledge. This report presents the development and preliminary results from the protocol established to track and assess short, intermediate, and long-term changes in cancer prevention knowledge, beliefs, intentions; interest in future research participation; and, ultimately, behavior changes among educational workshop attendees. Methods: The Ponce Health Sciences University – Moffitt Cancer Center Partnership’s Outreach Core provides cancer education to Spanish-preferring audiences in Tampa, FL, and Puerto Rico. We implemented a community outreach protocol (CONTINUAR) to track and assess individual’s cancer prevention knowledge, beliefs, and intentions before and after educational events using an innovative community cohort approach and longitudinal pre/post-test design. Demographic information and personal/familial risk factors were assessed at baseline. All sessions included education about age, gender, and risk-appropriate cancer screenings. Event attendees were asked if they were interested in

completing follow-up surveys at 12 and 24 months. Interested participants were consented via an information sheet. They also provided contact information and preferred contact modality for follow-up surveys. Results: Across two events with 449 community members, 223 (49.7%) completed pre/post assessments and 187 (41.6%) enrolled in the study. All event participants considered themselves H/L and 88% stated Spanish as their preferred language. The median age was 60. A paired samples t-test compared knowledge gained regarding current early detection screening guidelines before and after the educational activity, $t(222) = 7.97$, $p < 0.001$. Most participants surveyed after the workshop reported intention to: speak with a healthcare provider about cancer screening tests (96.2%), get screening for cancer (97.2%), discuss cancer screening with family or friends (95.4%), increase their physical activity (96.2%), participate in research studies (77.1%), and donate tissue to a biobank (68.9%). Conclusion: The results demonstrated the feasibility to enroll participants and an improvement in short-term knowledge. The success of this ongoing longitudinal effort remains to be realized as 12 and 24 months follow-ups aim to assess whether participants are indeed engaged in new health behaviors or accessed cancer-related early detection screening.

D023 Eat, move, live: A community-based intervention strategy aimed at reducing the perceived barriers toward healthy eating through tailored modifications in lifestyle and nutrition.

Katty Nerio, Cristal Resto, Marisela Garcia, Alejandro Fernandez, Mayra Serrano. City of Hope, Duarte, CA, USA.

Racial and ethnic minority groups experience diet-related disparities and as a result tend to have poorer nutrient dense dietary consumption. Dietary intake lacking nutrient dense foods has been associated with higher risk of cancer. Key contributors to diet-related disparities include environmental factors such as perceived barriers toward healthy eating. The Eat, Move, Live (EML) program seeks to increase participants’ knowledge, attitudes, and behaviors regarding nutrition and healthy eating habits. The purpose of this study is to examine the changes in perceived barriers to healthy eating following the completion of a community-based intervention strategy. Participants of the program attended either a 5-week or 12-week series of courses which included: a one-hour interactive nutritional education segment, a 30-minute food preparation followed by a demonstration, and 30-minute physical activity session. Each of the segments sought to address topics aimed at reducing the prevalence of cancer. Health behaviors, beliefs, and demographics were obtained utilizing a self-administered questionnaire. Body

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measurements and biomarkers were taken at baseline and at follow-up. A total of 93 participants completed the self-administered questionnaire. The population was made up primarily of females (83%); 52% were monolingual English speakers, 33% were monolingual Spanish speakers, 13% were Bilingual (English & Spanish), and 2% specified other. 71% of participants had a household income less than \$24,000/year and 30% had less than a high school education. Changes in perceived barriers to healthy eating were examined and there were statistically significant variations among 4 of the 13 reported barriers to healthy eating questions. When asked if it was difficult to eat healthy pre-intervention 39 of the 64 participants marked yes, but post-intervention only 26 of 64 marked yes ($p < .002$). Pre-intervention 22 of 40 stated that they did not know how to prepare healthy meals and post-intervention only 11 of 40 ($p < .003$). This study demonstrated that a tailored community-based intervention strategy can significantly reduce the perception of barriers to healthy eating, which has been linked to a reduction in cancer. EML was shown to increase participants' knowledge, attitudes, and behaviors about nutrition and eating habits.

D024 Evaluating cultural contexts in social support instruments used with African American cancer survivors:

A systematic review. [Shaila M Strayhorn](#)¹, Perla Chebli¹, Catherine Pichardo¹, Yamilé Molina¹, Carol J Ferrans¹, Kimlin T. Ashing². ¹University of Illinois at Chicago, Chicago, IL, USA, ²City of Hope, Duarte, CA, USA.

Background: Various instruments used to measure social support have emphasized the importance of examining the relationships between this interpersonal-level factor and specific health outcomes among cancer survivors. Through these instruments, an increase in certain factors of social support (i.e. sources of social support, type of social support, etc.) have been shown to improve the quality of life among cancer survivors. Unfortunately, social support instruments were not developed specifically for African American cancer survivors and therefore may not address the cultural contexts of this population. Objective: To conduct a systematic review examining the cultural contexts of social support instruments used with African American cancer survivors. Methods: PubMed, PsychINFO, and EMBASE were utilized to identify full-text quantitative articles that 1) possessed a study sample of at least 50% African American cancer survivors, and 2) referenced or documented the psychometric properties of the social support instrument. Results: We screened 1,161 titles and 113 abstracts. Eleven articles met the eligibility criteria and used nine different social support instruments. Only one of the instruments, the Ways of Coping Questionnaire,

was developed with a sample of African American cancer survivors. The remaining instruments were piloted with study samples that were either comprised of racially diverse undergraduates ($n=4$), married couples ($n=1$), breast cancer survivors ($n=2$), or individuals with various chronic illnesses ($n=1$). The Ways of Coping Questionnaire, was the only instrument that inquired about support from church members and God. Four of the remaining instruments, solely focused on support from other informal sources (i.e. family, friends, significant others). Emotional support was also observed to be the most prevalent type of social support within five of the nine instruments. Conclusion: African American cancer survivors were rarely represented during the development of social support instruments. As a result, the unique experiences and cultural contexts of African American cancer survivors are not adequately assessed by these commonly used social support instruments. Therefore, the science of survivorship, particularly with African American cancer survivors, suffers from the notable gap of cultural contexts when measuring social support. Moreover, additional types of social support (i.e. instrumental social support, belonging social support, and tangible social support), were rarely captured within the instruments despite their influence on the overall quality of life among cancer survivors. Developing an instrument that is initially piloted among African American cancer survivors would generate a better understanding of how different factors of social support may impact the overall quality of life of this population.

D025 “Place it in God’s hands”: Exploring the influence of sources of social support and religious coping practices of African American breast cancer survivors.

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Background: Religious coping (i.e. religious practices or beliefs that help an individual adapt to a stressful situation) has been shown to help African American breast cancer survivors obtain a better quality of life as well as find purpose from their cancer experience. Both prayer and church attendance are believed to be the most common religious coping practices among African American breast cancer survivors. However, relatively little is known about: 1) the relative commonness of religious coping practices; and, 2) which sources of social support (i.e. church members, clergy leaders, family, and friends) may also influence religious coping among survivors. Objective(s): To assess the prevalence of religious coping

mechanisms and the sources of social support who influence African American breast cancer survivors. Methods: The current study was a secondary analysis of the OASIS (Offering African American Survivors Increased Support) study. Participants were eligible for this study if they identified as being an African American female adult and were diagnosed between 2011-2014 within a local hospital in Chicago, IL. Eligible participants answered a modified version of the Church-based Social Support Scale and responded to open-ended questions related to their social support experiences by members of their social network. Results: A total of 33 participants completed the questionnaire at the time of data analysis. Weekly religious service attendance was highly prevalent among study participants post-diagnosis (n=12, 36.4%). Approximately eighteen percent of survivors (n=6) reported praying throughout their breast cancer journey. No participants reported receiving prayer from their church members or clergy leaders. However, nine participants (27.3%) expressed that a family member and/or a friend offered to pray for them throughout their cancer experience. Conclusion: There was a relatively high prevalence of church attendance. Family and friends appeared to be the more common source of influence in the form of religious coping through prayer. Future researchers should consider partnering with both family and friends when conducting faith-based and religious-based interventions to improve quality of life among African American breast cancer survivors.

D026 Correlates of lifestyle behaviors to prevent colorectal cancer among low-income Vietnamese Americans. Minsun Lee¹, Lin Zhu¹, Jin-Hyeok Nam¹, Cicely K Johnson², Carolyn Fang³, Grace X Ma¹. ¹Center for Asian Health, Lewis Katz School of Medicine, Temple University, Philadelphia, PA, USA, ²Hunter College, City University of New York, New York City, PA, USA, ³Cancer Prevention and Control, Fox Chase Cancer Center, Temple University Health System, Philadelphia, PA, USA.

Background Colorectal cancer (CRC) is the second most commonly diagnosed cancer and the third highest cause of mortality in Vietnamese Americans. Lifestyle behaviors including diet, physical activity, smoking, and drinking have been associated with the incidence of CRC. Despite the association between health behaviors and CRC, as well as documented non-optimal engagement in healthy lifestyle behaviors among this group, little research has been done to address health behaviors in Vietnamese Americans. Methodology We recruited 804 Vietnamese Americans aged 50 or older from 20 community-based organizations (CBOs) in the greater Philadelphia metropolitan area. As a dependent

variable, lifestyle behaviors were measured as a composite score of smoking, drinking, diet, and physical activity. Measures for independent variables included knowledge on CRC risks and screening, cancer related health beliefs, CRC screening self-efficacy, and CRC related social norm. Descriptive analysis, t-test (for categorical IVs) and correlation analysis (for continuous IVs) were first conducted to select the variables to be included in the multiple regression analysis. Results Among 804 participants, 41% were men, 60% were women, and about 22% were older than 75. Approximately 62% had an annual household income below \$20,000, and only 18% had a college degree or higher. We conducted a bivariate (t-test and correlation) analysis. The results showed that gender, income, knowledge on CRC risk factors, beliefs that getting cancer is determined by the fate, and two CRC-related social norms were associated with composite score of lifestyle behaviors. Multiple regression analysis showed that being female (log odds = 2.02, 95% CI 1.53-2.51) and having greater knowledge (log odds = .61, 95% CI .002-.21) on CRC risk factors are significant predictors of healthy lifestyle behaviors controlling for other variables. Conclusion Findings revealed sub-optimal levels of healthy lifestyle behaviors and knowledge of CRC risk factors among Vietnamese Americans. The study highlights the importance of educating knowledge about the risk factors of CRC to improve lifestyle behaviors, which may eventually contribute to preventing CRC in this population. Acknowledgement: This research project was supported by grant U01MD010627 (PI: Grace X. Ma, PhD) funded by National Institute on Minority Health and Health Disparities (NIMHD) of National Institute of Health (NIH), and partially supported by the grant of U54 CA221704(5) funded by the National Cancer Institute (NCI) of NIH (Contact PIs: Grace X. Ma, PhD and Olorunseun O. Ogunwobi, MD, PhD). The contents of this abstract are solely the responsibility of the authors and do not necessarily represent the official views of NIMHD or the NCI, NIH.

D027 Disparities in HPV awareness and knowledge of HPV-associated cancers. Robel Tesfay¹, Richard Moser². ¹National Cancer Institute, Center of Global Health, Rockville, MD, USA, ²National Cancer Institute, Division of Cancer Prevention and Population Sciences, Rockville, MD, USA.

Human Papillomavirus (HPV) is the most common sexually transmitted infection in the United States. The virus is responsible for 3% of all cancers in men and 2% of all cancers in women, resulting in 43,000 new cases of HPV-associated cancers per year, including cervical, oral, and anogenital cancers. This study aimed to assess these gaps in knowledge across several socio-demographic indicators. Data from

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the Health Information National Trends Survey (HINTS) 4 Cycle 4 (2014), HINTS 5 Cycle 1 (2017), and HINTS 5 Cycle 2 (2018) were combined resulting in a sample size of 10,466 respondents aged ≥ 18 years. Weighted, multi-variable logistic regression models were used to estimate gender, age, education, household income, and racial/ethnic disparities in knowledge of HPV and associated cancers. Predictors were also tested for interactions over time. Compared to males, females had significantly higher odds of hearing about HPV (OR=3.10) and linking HPV and cervical cancer (OR=1.73). Compared to US adults 18-34 years, each age subgroup in the study had lower odds of HPV awareness with significant differences in ages 50 and above. The gap in knowledge also shows a negative linear trend with age (35-49, OR=0.91; 50-64, OR=0.50; 65-74, OR=0.32; and 75+, OR=0.15). Similarly, respondents aged 50-64, 65-74, and 75+ had significantly lower odds of recognizing the HPV-cervical cancer link, when compared to 18-34 year old respondents (OR=0.75, OR=0.55, and OR=0.48), respectively. In comparison to Non-Hispanic (NH) White respondents, there were significantly decreased odds of HPV awareness among NH Asians (OR=0.20), NH Blacks (OR=0.63), and Hispanics (OR=0.68). NH Blacks and NH Other respondents also had significantly lower odds of associating HPV with cervical cancer (OR=0.58 & OR=0.49), respectively. Those with some college and a college or more education were 2.36 and 3.27 more likely to know that HPV can cause cervical cancer when compared to those with a less than high school education, respectively. Compared to US households earning less than \$20,000, those earning more than \$75,000 had higher odds of knowing that HPV can cause cervical cancer (OR=1.64). Interaction effects of education and income with HPV awareness are currently under investigation. No significant age, race/ethnicity, gender or education differences were observed for HPV association with oral, anal and penile cancers, however, an overall low awareness of the causal relationships can be observed. Overall, interventions towards increasing HPV and cervical cancer knowledge should be targeted towards men, older populations and racial/ethnic minorities. This is especially crucial considering the disproportionate impact of HPV and associated cancers in these same groups. There should also be an increased effort towards educating the public about the causal link between HPV and penile, anal, and oral cancers. Increased awareness could in turn lead to safer sex practices and an increased HPV vaccine uptake in these communities.

DO28 Evaluating medical and dental students' human papillomavirus-related cancer knowledge and perceived self-efficacy in HPV vaccine communication and recommendation practices.

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Introduction: Medical and dental care are largely siloed, making it difficult for these culturally, financially, and educationally different health care professionals to work together to provide comprehensive care. Engaging dentists in HPV-related prevention activities may be a meaningful strategy to reduce HPV-related morbidity and mortality. Therefore, effective prevention strategies coupled with systems-level strategies could improve interprofessional approaches in HPV prevention. We sought to assess HPV health literacy and intended HPV vaccination recommendation and communication practices among future health care providers. Methods: A 31-item survey for dental students and 25-item survey for medical students assessing HPV and HPV vaccine knowledge, willingness to administer HPV vaccines, self-efficacy in engaging in preventive efforts, and basic demographics was administered to students from a southeast School of Dental Medicine and School of Medicine. Surveys were administered in Spring 2018 for dental students (N=109) and Spring 2019 for medical students (N=105). Results: Dental students' sample was 61% female, mean age of 25.79 (SD=3.31), 61% white, 48% 1st year and 52% 3rd year. Medical students' sample was 51% female, mean age of 25.18 (SD=3.31), 58% white, 71% 1st year and 29% 2nd-4th year. Among our sample, 62% of dental students self-reported receiving the HPV vaccine (30% completion rate) and 56% of medical self-reported being vaccinated (22% completion rate). The majority (67%) of dental and medical students did not know most HPV infections clear up on their own within 2 years and that HPV-related OPC is higher among men as compared to women (66% of dental; 78% of medical students). In regards to vaccine knowledge, 54% of dental students were not aware of the recommended 2-dose administration and 45% of medical students were not aware of vaccine recommendations for gay, bisexual, and other men who have sex with men, transgender people, and for immunocompromised persons. When asked about perceived self-efficacy in engaging in HPV preventive efforts, 42% of dental students anticipated having an uncomfortable conversation with patients when recommending the HPV vaccine, 43% did not feel confident in performing oral cancer exams, 56% did not feel confident in recommending the HPV vaccine, and 66% did not feel confident in talking about HPV risk factors. Among medical students, 27% anticipated having an uncomfortable conversation with patients when

recommending the HPV vaccine, 29% did not feel confident in recommending the HPV vaccine, and 37% did not feel confident in talking to patients about HPV risk factors. Final analysis will be presented at conference. Conclusion: This study can improve our preliminary understanding of interprofessional training opportunities for effective systems-level strategies to improve bidirectional access and communication across oral health and primary care to engage in effective HPV prevention across professions.

D029 What do veterans ages 27 years and older know and think about the HPV vaccine? [Lisa T Wigfall](#)¹, Susana Ramirez², Yamile Molina³, Nynikka Palmer⁴, Angelica M Roncancio⁵, Daisy Y Morales-Campos⁶. ¹Texas A&M University, College Station, TX, USA, ²University of California at Merced, Merced, CA, USA, ³University of Illinois at Chicago, Chicago, IL, USA, ⁴University of California at San Francisco, San Francisco, CA, USA, ⁵University of Houston, Houston, TX, USA, ⁶University of Texas at Austin, Austin, TX, USA.

Objective. The purpose of this cross-sectional study was to examine HPV-related awareness, knowledge, beliefs, and risk factors among Veterans ages 27 years and older. Methods. We used data from a subsample of 167 Veterans who responded to the 2017 Health Information National Trends Survey (HINTS) to conduct this cross-sectional study. HPV vaccine awareness and beliefs were our primary outcomes of interest. HPV-related cancer risk factors (i.e., cigarette smoking, socioeconomic status) were our secondary outcomes of interest. HPV awareness and knowledge were also examined. Proportions with 95% confidence intervals were performed using Stata/SE version 15.1 (College Station, TX, USA). Results. All of the Veterans who responded to the 2017 HINTS were ages 27 years or older. Most were non-Hispanic White (80%, 73-88%); heterosexual, or straight (97%, 94-99%); male sex (89%, 85-94%); and had an annual household income greater than \$50,000 (67%, 57-78%). While almost half had smoked combustible cigarettes in past (49%, 39-60%) and some (15%, 7-24%) still smoked combustible cigarettes, the majority had never (<1-2 lifetime) smoked electronic cigarettes (82%, 73-91%). About half had heard of the HPV vaccine (52%, 40-64%), of which most were ambivalent about whether or not the HPV vaccine was effective at preventing cervical cancer (72%, 61-84%). Although 63% (52-74%) had heard of HPV, mean HPV knowledge scores (2.0±0.3) were low (range: 0-6). Conclusions. Although the Food and Drug Administration (FDA) has approved the HPV vaccine for use among adults ages 27-45 years, little is known about what adults ages 27 years and older in the general population know and think

about the HPV vaccine. Even more concerning is the fact that almost twice as many of the Civilians (N=1,341) who completed the 2017 HINTS had never (<100 lifetime) smoked combustible cigarettes (61%, 56-66%). Similarly, among the 1,341 Civilians who completed the 2017 HINTS were more aware of HPV (76%, 72-80%) and the HPV vaccine (73%, 69-77%); had higher HPV knowledge scores (2.6±0.01); and were less ambivalent about whether or not the HPV vaccine was effective at preventing cervical cancer (62%, 59-66%). Increasing HPV-related awareness and knowledge, promoting positive beliefs about the HPV vaccine, and reducing modifiable HPV-related cancer risk factors (i.e., cigarette smoking) will be necessary first steps to increasing HPV vaccination among Veterans ages 27 years when/if clinical practice guidelines change in the future as a result of the FDA approval for HPV vaccine use among adults ages 27-45 years.

D030 Arguments in favor and against the new HPV school entry implementation in Puerto Rico: Content analysis of online media coverage. [Glizette O Arroyo-Morales](#)¹, Vilnery Rivera-Figueroa², Roxana Soto-Abreu³, Manuel E Rivera-Encarnación³, Olga L Diaz-Miranda³, Diana T Medina-Laabels³, Ana P Ortiz-Martinez⁴, Erick L Suárez-Pérez⁵, Maria E Fernández⁶, Pamela C Hull⁷, Vivian Colón-López⁸. ¹University of Puerto Rico, Medical Sciences Campus School of Public Health, Department of Health Administration, Evaluative Research of Health Systems program, San Juan, PR, USA, ²University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Health Administration, Evaluative Research of Health Systems program, San Juan, PR, USA, ³Comprehensive Cancer Center, Division of Cancer Control and Population Sciences, San Juan, PR, USA, ⁴Comprehensive Cancer Center, Division of Cancer Control and Population Sciences; University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Biostatistics and Epidemiology, San Juan, PR, USA, ⁵University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Biostatistics and Epidemiology, San Juan, PR, USA, ⁶University of Texas, Health Science Center at Houston, Houston, TX, USA, ⁷Vanderbilt University, Department of Medicine, Nashville, TN, USA, ⁸Comprehensive Cancer Center, Division of Cancer Control and Population Sciences; University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Health Administration, Evaluative Research of Health Systems program, San Juan, PR, USA.

Background: In August 2018, Puerto Rico (PR) adopted the Human papillomavirus (HPV) vaccine as a school-entry requirement for all students (male and female) 11 to 12 years

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old. Information about HPV shared in online media outlets may influence vaccine hesitancy, uptake, and parental decision. Before and after the requirement took effect, news coverage of this policy promoted discussions by groups in favor of the vaccine as well as the uproar of anti-vaccine groups, which may have influenced parental perceptions of the school-entry policy. Objective: This qualitative study explored arguments in favor of and against HPV vaccination and the new school-entry vaccination policy among parents, stakeholders, and coalitions in Puerto Rico. Methods: A systematic review was conducted to identify digital media reports related to the HPV vaccination policy and its implementation in PR from January 2017 to December 2018. This analysis focuses only on the codes extracted from the arguments provided by different organizations, coalitions and parents interviewed in the media. A grounded theory approach was used to identify emergent arguments discussed during this period in the news reports. ATLAS.ti 8 was used to facilitate data manipulation and retrieval. Results: Of all the quotes analyzed, 78% were coded as negative (against), 19% were positive (in favor) and only 3% were neutral towards the new HPV school-entry policy. The analysis identified emergent themes related arguments in favor of and against the HPV vaccine policy implementation. Positive arguments frequently discussed, included the following themes: 1) importance of the HPV vaccine for cancer prevention; 2) acknowledgment of sexual practices/activities in youth and 3) healthcare provider recommendation. Primary themes that emerged in arguments against the HPV school-entry policy included: 1) patient autonomy; 2) the right of parents to be informed about the vaccine; 3) lack of education regarding the efficacy of the vaccine; 4) potential risk of vaccines; and 5) pharmaceutical and economic interests. Conclusion: This study explored the most emerging arguments discussed in the media before and during the implementation of the HPV school entry policy in Puerto Rico. Most information disseminated was against this new policy. Media shared online was not balanced, which can lead to the promotion of vaccine hesitancy. Future online media coverage could expand the scope of information and provide a balanced, unbiased overview of this school-entry policy from a more comprehensive range of reliable sources.

D031 Developmental evaluation model for the Florida-California CaRE2 Health Equity Center. Linda S Behar-Horenstein¹, Joyce Richey², Alexander Parker³, Folakemi T Odedina⁴, [Nissa Askins](#)⁴. ¹University of Florida, Gainesville, FL, USA, ²University of Southern California, Los Angeles, CA, USA, ³University of Florida Health Jacksonville, Jacksonville, FL, USA, ⁴University of Florida Research and Academic Center Lake Nona, Lake Nona, FL, USA.

Introduction: The Florida-California CaRE2 Health Equity Center was established in 2018 to address cancer health disparities in Black and Latino communities through innovative translational research in cancers of high mortality. Long term, the CaRE2 Center aims to: 1) reduce cancer disparities in Blacks and Latinos; 2) train and increase the pool of underrepresented Black and Latino scientists conducting health disparity research; 3) increase research capacity at a historically minority serving institution (FAMU); and 4) increase cancer disparity research at UF and USC-NCCC. Two full projects and one pilot project focused on prostate and pancreatic cancers are supported by several cores, including the Tissue Modelling Core. The projects provide research training opportunities across the triad partnership to underrepresented minority students, post-doctoral fellows, and early stage investigators. In this presentation, we describe how the developmental evaluation model (DEM) guided assessment of the CaRE2 Center's objectives. Methods: The CaRE2 Center Planning and Evaluation Core (PEC) has conducted continuous planning, evaluation and tracking of the partnership activities to ensure the successful achievement of the aims proposed for the Center, its cores, and research projects. The achievement of program goals has been guided by the Provus' DEM, which focuses on evaluating performance and improving program function. Its premise is that evaluation is: (1) a constructive activity; (2) a dynamic ongoing process; and (3) includes comparison of actual performance with standards and expectations. Each PEC member was assigned as a liaison to one or more of the Center's cores and research projects. Using a tabular format, each liaison drafted an evaluation plan to guide assessment of their proposed objectives. The liaisons participated in regularly scheduled core and project meetings during the year one of the Center. Results: Each liaison discussed and solicited feedback related to the comprehensive draft evaluation plans. Using a table format, a list of the aims, outcomes, and corresponding benchmarks was presented alongside PEC feedback. PEC feedback provided: (1) evidence of if and how the benchmark was met; and (2) if achieving a benchmark was still in progress. If a benchmark had not been achieved, PEC requested additional information or suggested

evaluation metrics to assess future attainment. Each report also included a summary statement in which PEC provided commendations, suggestions, weaknesses, and/or guidance for future reports. PEC provided this feedback formatively and individually to core and research projects quarterly and via a cumulative annual progress report. A comprehensive overview of all core and research project formative reports was sent to the Administrative Core for continuous quality improvement. The Center exceeded most of the benchmarks for year one. Conclusion: The DEM has been instrumental in guiding present and future attainment of the CaRE2 Center objectives.

D032 Characterizing county-level community context, patient-caregiver networks, and social functioning among rural cancer survivors and caregivers: Preliminary data from the Illinois Rural Cancer Assessment. [Leslie R Carnahan](#), Karriem S Watson, Yamilé Molina. University of Illinois at Chicago, Chicago, IL, USA.

Background: Rural cancer survivors and caregivers, compared to urban, experience a number of health disparities, including worse patient-reported outcomes (e.g. quality of life, self-rated health). There is a need to characterize multilevel determinants that may contribute to these inequalities. Objective: In the present study, we characterize rural survivors' and caregivers' social contexts, including county-level communities, patient-caregiver networks, and social functioning. Method: The Illinois Rural Cancer Assessment was a descriptive, cross-sectional study for self-identified adult rural cancer survivors and caregivers from rural Illinois. Participants were recruited from 2017-2018 through multiple non-probability-based sampling methods and completed the survey online, by phone, or by self-administration. At the county level, we used 2013 Rural-Urban Continuum Codes for rurality, American Community Survey data for 10 economic indicators, and the American Cancer Society's cancer resources database to enumerate cancer support services. At the interpersonal level, survivors described their network of caregivers via a modified version of Burt General Social Survey. At the intrapersonal level, survivors completed FACT-G to assess social functioning. Two-step Latent Class Analysis (LCA) was conducted. Results: The final sample included 139 survivors and 88 caregivers. Preliminary analyses suggest four county-level contexts for survivors and caregivers: 1) southern, rural, most economically disadvantaged counties with the fewest support services (30%, n=68); 2) northern, more rural, more economically disadvantaged counties with fewer support services (29%, n=65); 3) central, rural, more

economically disadvantaged counties with fewer support services (29%, n=66), and 4) central, metropolitan, most economically advantaged counties with the most and most diverse support services (12%, n=28). There were three types of social network classes among our survivor participants: 1) no caregivers (28%; n=39); 2) only spousal caregivers with constant daily communication (23%; n=32); and, 3) multiple caregivers with variation in daily communication (50%, n=68). For caregivers, 55% reported caregiving for only 1 patient. Caregiving for a family member was most common and about 40% reported daily communication with patients. About 35% of survivors and 40% of caregivers reported low social functioning. Discussion: Our preliminary findings suggest a rich diversity of social environments at different levels for rural survivors and caregivers. Further, LCA suggests non-linear and linear associations between dimensions underlying these community contexts and networks.

D033 High-intensity interval training is feasible in Hispanic patients with breast cancer undergoing anthracycline chemotherapy. [Kyuwan Lee](#), [Karina Ortiz](#), [Jessica Goytizolo](#), [Theresa Serrano](#), [Christina M Dieli-Conwright](#). USC, Los Angeles, CA, USA.

Background and Purpose Chemotherapy may initiate and worsen comorbid conditions such as obesity, diabetes, and cardiovascular disease in women undergoing treatment for breast cancer. Hispanic women are more likely to be obese and physically inactive than matched non-Hispanic counterparts, increasing the risk for developing comorbid conditions during chemotherapy. High intensity interval training (HIIT) is a safe, time-efficient exercise strategy that has been deemed more effective than moderate continuous aerobic exercise at improving cardiovascular health in patients with heart failure and stroke. The study purpose was to determine whether a HIIT intervention is a feasible exercise strategy for Hispanic patients with breast cancer undergoing anthracycline-based chemotherapy. Experimental Design Sedentary, overweight or obese (BMI³25.0 kg/m²) Hispanic patients with breast cancer (Stage I-III;) were randomized to exercise (n=11) or control (n=11). Participants performed a maximal cycling fitness test to measure peak power output (PPO) during maximal oxygen uptake (VO₂max). The exercise group participated in an 8-week HIIT intervention occurring 3 times weekly. Adherence measures used to define feasibility were calculated for each participant by computing (1) the average weekly minutes of HIIT over 8 weeks and (2) the number of sessions attended and multiplied by 100 (percentage of sessions). The HIIT

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intervention was considered feasible if more than 50% of participants completed both an average of 70% of weekly minutes (63/90 minutes) and attended 70% exercise sessions (17/24 sessions). Descriptive statistics were performed for exercise adherence in the exercise group. Paired sample t-test was used to compare VO₂max from baseline to post-intervention in the exercise group. Summary of Results Eleven Hispanic women with an average age of 48.9±6.2 years and BMI of 34.8±7.3 kg/m² were included. The average weekly minutes of exercise completed was 80.2±6.9 out of 90 minutes. The exercise group attended an average of 20.1±3.8 (83.8%) out of 24 sessions. Nine of 11 (82%) participants in the exercise group met both feasibility criteria. No adverse events occurred. VO₂max was not significantly changed in the exercise group (15.6±5.1 to 15.8±4.3, p=0.92) while significantly reduced in the control group (18.1±3.3 to 16.0±3.1, p=0.001) following 8 weeks. Conclusions HIIT is a feasible exercise intervention in Hispanic patients with breast cancer receiving anthracycline-based chemotherapy, as demonstrated by the high adherence to the intervention. HIIT should be considered a safe, feasible exercise strategy to utilize among minority patients with cancer.

D034 Patient and provider concordance and trust in providers among West African Immigrants: Findings from the CaPTC Familial Cohort Study. Nissa Askins¹, Ruth Agaba², Oluwaseyi Adeniji², Adaora Ezeani¹, Ernest Kaninjing³, Folakemi Odedina², Catherine Badejo², Anthonia Sowunmi², Omolara Fatiregun², Ayo Salako², A. A Popoola², Mohammed Faruk², Emeka Iweala², Iya Bassey², Chidiebere Ogo², O. P. Oluwole², H. A. Nggada², Paul Jibrin², Ifeoma Okoye², Abidemi Omonisi², Iheanyi Okpala², A Adeniji², Toy Adeniji⁴. ¹University of Florida, Orlando, FL, USA ²Prostate Cancer Transatlantic Consortium CaPTC, Nigeria, ³Georgia College and State University, Milledgeville, GA, USA, ⁴Prostate Cancer Transatlantic Consortium (CaPTC) Region 2, Nigeria.

Background Healthcare disparities among racial and ethnic groups have been well documented across all aspects of clinical healthcare, and disparities in attainment of preventive services are particularly prevalent. African immigrants may be particularly susceptible to factors that contribute to healthcare disparities but little is known about this population. The purpose of this study was to assess patient-provider concordance and trust of health care providers among West African immigrants in the US. In addition, we explored the relationship between these variables and the prostate cancer (CaP) screening behavior of participants. Methods Data collection was part of a global study of prostate cancer in West African men. A study

questionnaire was used to collect data from West African male immigrants in the US between the ages of 35 and 70 years. Survey scales for this study included country of birth, years since immigration, patient-provider concordance, trust of healthcare provider, attitude and cues towards CaP screening (PSA and DRE), and CaP screening history. Results There were 38 African immigrants from Cameroon, Nigeria, Sierra Leone, and Ghana. Participants' average age was 46.2 years and they had spent an average of 13.9 years in the US. Most of the participants (over 60%) stated that they had no preference in regards to their provider race, ethnicity or gender. Over 70% indicated that their physician was of different ethnicity and race while 50% indicated that their physician was of a different gender. Furthermore, most respondents noted that they trusted their physicians with health decisions. However, 61% and 68% of participants did not complete PSA or DRE testing, respectively. Most stated that they did not discuss the advantages or disadvantages of prostate cancer screening with their physicians, noting they mostly received cues to getting tested from reading information, radio, and/or TV. Conclusion Although health disparities can be explained by socioeconomic status such as lack of insurance and various other observable impediments to accessing health care, others barriers persist. It is important to explore other contributing factors such as patient-physician relationships. This study suggests that patient-provider concordance may not be a priority. Emphasis should be placed on encouraging physician-initiated discussion on CaP screening. Unfortunately, current physician guidelines do not stress CaP screening and fail to account for the documented increased risk and early onset of CaP in Black men.

D035 Tracking of undergraduate research trainees for continuous improvement of the ReTOOL program. Parisa Fathi¹, Folakemi Odedina¹, Bereket Mochona², Renee Reams², Jennifer Nguyen³, Nissa Askins¹, Ernest Kaninjing⁴, Linda Behar-Horenstein¹, Debra Lyon¹, Merr Jennifer Markham¹, Adaora Ezeani¹. ¹University of Florida, Orlando, FL, USA, ²Florida Agricultural and Mechanical University, Tallahassee, FL, USA, ³Mercer University, Macon, GA, USA, ⁴Georgia College & State University, Milledgeville, GA, USA.

Introduction With the limited progress in eliminating cancer disparities, it is important to develop a diverse oncology workforce who will effectively address cancer disparities. Implemented in 2012, the Research Training Opportunities for Outstanding Leaders (ReTOOL) Program focuses on increasing the number of underrepresented minority (URM)

cancer scientists in Florida. URM undergraduate students from the state of Florida are invited to participate in a 16-week, hands-on research experience at the University of Florida (UF). Students are assigned to a UF mentor who facilitates their research training and aid their professional development through multiple scholarly activities (<http://retool.cop.ufl.edu/>). This project focuses on the program evaluation of the ReTOOL program. Methodology ReTOOL alumni are tracked for 10 years to provide evaluation and their career status through biannual surveys. The survey asks about their experience in participating in the program; skills gained during the program; how their participation has benefited their professional development; and their opinions about the program. Alumni respond to open-ended, Likert scale, and multiple choice questions. All open-ended questions in the 2015, 2016, and 2018 surveys were employed for this study. Data analysis comprised the use of themes to categorize the responses. Sub-theming was also used to address specifics within responses; for example, “networking” was divided into “networking among peers” and “networking among UF faculty.” Results Open-ended responses by ReTOOL alumni provided unique perspective on what makes undergraduate research training programs impactful for minority trainees. The ReTOOL alumni noted that strong partnerships with their UF mentor and lab made the program effective. Some attributes of an effective mentor included encouragement, frequent communication, and the ability to shadow in clinical settings. Trainees noted that the information presented about grant and proposal writing would provide future benefits. Understanding scientific research (e.g. ethical practices, documentation, and replication) was a gap filled through participation. Trainees noted that the resources available at UF were excellent and included state-of-the-art technology compared to technology at their home institutions. Improvement opportunities noted included communication with mentors, stipend disbursement timeline, and accommodation. Overall, alumni noted that participating in research informed their graduate school decisions and recommend participating in the program. Conclusion The responses from ReTOOL alumni aided in continuous improvement of the program and effective transplantation of the ReTOOL program at Florida A&M University. Although tracking alumni over the years could be challenging, it is worth it for effective planning of future research training programs. ReTOOL alumni achievements include doctoral degrees (PhDs and MD), publications, presentations and awards.

D036 Assessing underrepresented and health disparities investigators’ interests and needed research support in emerging areas of science. [Linda Fleisher](#), Carrie Norbeck. Fox Chase Cancer Center, Philadelphia, PA, USA.

Purpose: The Geographic Management of Cancer Health Disparities Program (GMAP), initiated 2009, is a national program funded by the National Cancer Institute’s Center to Reduce Cancer Health Disparities (CRCHD). GMAP Region 4 is a thirteen state region with over 800 members of underrepresented and health disparities investigators utilizing a multipronged engagement approach to support diverse investigators in their career trajectory including basic, clinical, population and translational research. Understanding how to support these investigators to be successful in new emerging areas of science is critical. Methods: Previous surveys focused on barriers to funding for diversity training awardees and feedback on the value of specific programs, such as travel scholarships supporting early stage investigators (ESI). This current survey focuses additionally on emerging areas of science, including: precision medicine, mHealth, implementation science and commercialization to better understand our members current research interest in these areas and the kinds of support investigators need as they compete in these arenas. This survey is being distributed and data collection and analysis will be completed this summer. Summary of Results: Our previous surveys indicated that ESI’s ranked the following services as “Most Beneficial.” Travel Scholarships – (95.5%); Pilot Funds (for feasibility data collection to support ongoing research) – (, 77.3%); E-blast with job/funding/training resources – (54.5%); Grant Review - (50.0%); and Introductions to CRCHD Program Officers in Training Navigation - (47.6%). We will compare findings from the current survey to determine the ongoing value of these programs as well as the scope of current research in these new emerging areas and the types of support and services required to build investigators research portfolios in these areas. Recommendations: Ongoing programmatic strategies utilized by GMAP Region 4 have been highly valued. The findings of this current survey will provide a deeper understanding of underrepresented and health disparities researchers’ interest in emerging areas of precision medicine, mHealth, implementation science and commercialization as well as recommendations on how to support their research in these areas particularly related to health disparities.

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D037 Training the next generation of undergraduate URM cancer scientists: Results and lessons learned from a cancer research Partnership Scholar Program.

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Background: To improve cancer disparities among underrepresented minority (URM) populations, better representation of URM individuals in cancer research is needed. The San Diego State University (SDSU) and University of California San Diego (UCSD) Moores Cancer Center Partnership is addressing cancer disparities through an educational program targeting undergraduate URM students. **Aims:** To increase the proportion of URM individuals participating in cancer research by providing a range of research education opportunities supported by the Partnership Scholar Program **Methods:** The Partnership provides a paid intensive summer research internship enriched with year-round activities that include educational sessions, a journal club, mentorship, social activities, and poster sessions and presentations. Program evaluation through follow-up surveys, focus groups and other formal and informal feedback, including advisory and program steering committees are used to improve the program. **Long-term follow-up** among scholars (minimum of 10 years) provides data to evaluate the program's long-term impact on scholars' education and career path. **Results:** Since 2016, 63 URM undergraduate students participated in the scholar program. At the Year 2 follow-up (2016 cohort; n=12), 50% had completed their GRE and/or applied to graduate school or medical school. **Lessons learned** during the course of the program led to changes that were implemented to provide a better learning experience and increase overall program satisfaction, which include: 1) Lengthening the recruitment timeline to improve reach of eligible students and to provide more time for scholar selection and onboarding. 2) Improving the recruitment processes by collaborating with organizations serving URM students. 3) Refining the program contracts and onboarding meetings to help clarify expectations for

scholars and faculty mentors. 4) Program coordinator skills and responsibilities (e.g., communication with scholars and mentors) are key to scholar satisfaction and retention. The coordinator organizes and communicates program activities, holds one-on-one in-person meetings, and provides ongoing mentorship to increase retention and scholar success in their ongoing academic development. 5) Adjustments to program components, such as scheduling and curricula of the summer education sessions, pairing scholars with clinicians, and the addition of social events were implemented to improve scholars' learning experience. 6) Efficient tracking of the multitude of evaluation metrics requires a well-mapped and scheduled evaluation plan that includes automated publication notification systems and LinkedIn groups to evaluate scholars' satisfaction and achievements post-program completion. **Conclusions:** The Partnership identified best practices and lessons learned for implementing lab-based internship scholar programs in biomedical and public health fields that could be considered in other programs. (U54CA132384 & U54CA132379)

D038 MTPCCR lives on! After 20 successful years—a new phase for the cancer diversity training program.

Marjorie Kagawa-Singer¹, Rena J Pasick². ¹UCLA, Los Angeles, CA, USA, ²UCSF, San Francisco, CA, USA.

Background Most US health-related diversity training programs focus on STEM fields. No standing national commitment to diversity training exists in the public health and social/behavioral sciences. This is particularly troubling in the age of precision medicine and the context of unrelenting cancer disparities. For the former to have an impact on the latter, communities with the greatest burden of cancer should be over-represented as participants in research and among patients benefiting from the many scientific advances. Yet the opposite is true. The scientific disciplines embedded in the real world of marginalized and underserved communities are the applied social sciences. Thus, begging the question: why is diversity in the lab more important than diversity in the community? **MTPCCR** Recognizing that to be relevant and effective, disparities research must be led by members of the communities affected by inequities, we secured an NCI training grant in 1998 to establish the Minority Training Program in Cancer Control Research (MTPCCR). The purpose was to encourage master's level students/professionals in public health and social/behavioral sciences to go on to the doctorate and careers as leaders in cancer disparities research. Four continuous grants and 20 years later, the MTPCCR has achieved the following: • 3 programs: o 1st site in Northern California (now UCSF) from 1998-2018 o 2nd

site established at UCLA (2001-2018) o Seeded a separate program, Exito! for Latinxs (UT Health Science Center, San Antonio 2010-2020, PI Amelie Ramirez) • MTPCCR results: o 759 participants to date - Asian - 28% - African American - 28% - Latinx - 22% - White - 3% - Other/Multiple race/ethnicity - 9% - American Indian - 1.7% o 248 (33%) entered doctoral programs (80% attribute this to MTPCCR) o 144 graduated with doctorates; 92 are current doctoral students o MTPCCR alumni are post-doctoral fellows and on faculty around the country - Highest rank to date: Full Professor, UCSF o MTPCCR alumni are PIs on NIH grants - Many focus on cancer disparities Major components of our annual program included: 5-day summer institute; research internships; and doctoral application support awards. Alumni are tracked through a web-based survey. Next Steps Changes to the T funding mechanism now preclude renewal of our model. It is thus time for the institutions with the most to gain from this program and the resources to take up the cause. These include Comprehensive Cancer Centers (whose missions increasingly focus on serving their region and on curbing cancer disparities), and Schools of Public Health. At the vanguard is the UCLA Comprehensive Cancer Center, whose leadership has raised philanthropic funds to continue MTPCCR for the coming two years. With this demonstration of institutionalization, we now turn to development of strategies for organizational partnerships to continue the program with relatively small individual investments and the potential for important gains in both diversity and reducing cancer disparities.

D039 Student-centered Pipeline to Advance Research in Cancer Careers (SPARCC): A new program to increase underrepresented minorities in clinical cancer research careers. [Kristina Kaljo](#), Robert Treat, Janet Rader. Medical College of Wisconsin, Milwaukee, WI, USA.

An eight-week intensive pipeline training program was designed to recruit and prepare underrepresented minority undergraduate students to pursue careers as clinical research professionals and obtain advanced degrees in cancer research to improve diversity and culturally responsive care in clinical cancer research. Cancer clinical trials are imperative to advance therapies and improve patient survival rates, yet barriers exist preventing underrepresented minorities (URM) from participating. There is a need to foster a diverse healthcare workforce who mirror the larger population, yet national statistics report sluggish growth in the recruitment of underrepresented minorities (URM) to scientific occupations. Student-centered Pipeline to Advance Research in Cancer Careers (SPARCC) is a newly funded

five-year National Cancer Institute R25 education program recruiting URM, to become clinical research professionals (CRPs) or seek advanced degrees in clinical cancer research. The eight-week program immerses students in hands-on experiences framed by the Joint Task Force for Clinical Trials Competency Domains. Grounded in theory of experiential learning and culturally responsive teaching, 35 faculty and CRPs taught and served as student champions, spanning pediatric oncology, oncology pharmacy, surgical oncology, gynecologic oncology, genetics, palliative care and medical oncology. Scholars experienced first-hand the methods in which complex trials provide innovative precision cancer treatments. Scholars completed a 'Wicked Problems' research project on cancer health disparities. Analysis of SPARCC evaluation data and one-on-one exit interviews utilizes both qualitative and quantitative methods. Of 39 applications received, 62% (24/39) identified as URM and 77% (30/39) were females. All applicants were enrolled in undergraduate programs or recently graduated with a bachelor's degree. Most were pursuing biomedical science majors (30/39) with interest to seek careers in healthcare (34/39). In June 2019, ten scholars were accepted (9 females, 1 male), 90% of the matriculating cohort identified as URM. Over 84 different workshops were facilitated, and Scholars participated in three, two-week practicum rotations. Workshop sessions were evaluated by students using free text, 5-point Likert scale questions rating efficacy, satisfaction, and skills of the facilitator and an overall ten-point rating. Wicked Problems projects focused on: stigma of prostate health among African American males, cervical cancer screening among Latinas, impact of food insecurities on cancer treatment, skin cancer prevention among African Americans, and improving enrollment of URMs in clinical trials. Evaluation data is forthcoming. SPARCC has paved the way as an innovative and pedagogically sound education training program for URM. By curating an experience integrating research methods, cancer epidemiology, and health disparities, Scholars have a passion for clinical cancer research.

D040 University of Guam/University of Hawaii Cancer Center Partnership: Sixteen years of progress in addressing cancer health disparities in Pacific Islanders. [Rachael T. Leon Guerrero](#)¹, Margaret Hattori-Uchima¹, Hali R Robinett², Carl-Wilhelm Vogel², Neal A Palafox². ¹University of Guam, Mangilao, Guam, USA, ²University of Hawaii Cancer Center, Honolulu, HI, USA.

The University of Guam (UOG)/University of Hawaii Cancer Center (UHCC) Partnership aims to grow cancer research capacity at UOG, develop cancer health disparities research

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at UHCC focusing on Pacific Islanders (PI), raise awareness of cancer and cancer prevention in Guam (GU), Hawaii (HI) and the US Associated Pacific Islands (USAPI), and increase the number of cancer and biomedical science researchers of PI ancestry in the United States. An infrastructure comprised of 4 principal investigators, over 30 participating faculty, administrative staff, and external and internal reviewers, backed by institutional support and NCI sponsorship, has supported 16 years of research, training, and outreach designed to reduce cancer health disparities and advance health equity among PI in GU, HI, and the USAPI. Since 2009, the Partnership has funded 19 cancer research projects addressing cancer research priorities of global and regional relevance, including cervical cancer and Areca (betel) nut chewing - a traditional practice associated with oral pre/carcinoma, affecting 600 million users worldwide. Ninety peer-reviewed manuscripts have been published, over 100 abstracts presented, and 19 grants secured. To address the underrepresentation of PI in biomedical sciences, the Partnership has supported 33 graduate students including 7 doctoral students at UH. Two PhD graduates are now faculty members at UOG and engaged in cancer health disparities research. UOG's Micronesia Studies Program now offers a cancer health disparities track, developed by the Partnership and tailored for the Pacific region. In addition, UOG/UHCC faculty, junior investigators, and pre/postdocs receive mentorship, career development, and summer research fellowships; to date, eight UOG faculty have participated in the summer fellowship program at UHCC and most had received U54pilot funding. Outreach projects have explored community-based participatory approaches to youth tobacco use prevention and cessation in Guam, and the use of social networking to reduce tobacco-related cancer risk. Community-based participatory research has also led to landmark tobacco control legislation in Guam, resulting in decreased tobacco use and increased tobacco taxes, a percentage of which supports cancer programs and patient services in Guam including the Guam Cancer Registry. Current outreach efforts aim to increase colorectal cancer screening and HPV vaccination while building knowledge and awareness among physicians who serve Pacific Islanders in Guam and Hawaii. In conclusion, research capacity at UOG has significantly increased, disparities research at UHCC has expanded, and underrepresented minority students are pursuing careers in cancer research. Supported by NCI grants U54CA143727 and U54CA143728.

DO41 Efforts to implement a participatory evaluation plan for Comprehensive Partnerships to Advance Cancer Health Equity.

Equity. [Jessica McIntyre](#)¹, Sylvia Peral², SJ Dodd³, Linda Behar-Horenstein⁴, Hala Madanat⁵, Abigail Shain⁶, Sherri De Jesus⁷, Kelly Laurila⁸, Hali Robinett⁹, Kristi Holmes¹⁰, Nelson Aguila¹¹, Melissa Marzan¹², Leo Sychala¹³, Anthony Barrios⁵, Desiree Rivers¹⁴, Helena Loest¹⁵, Marilyn Drennan¹⁵, Sarah Suiter¹⁶, Joyce Richey¹⁷, Terrell Brown¹⁸, Lecarde Webb¹⁹, Karen Hubbard¹³, Isabel C Scarinci²⁰. ¹Moffitt Cancer Center, Tampa, FL, USA, ²O'Neal Comprehensive Cancer Center at the University of Alabama at Birmingham, Birmingham, US, ³Hunter College, CUNY, New York, US, ⁴University of Florida, Gainesville, US, ⁵San Diego State University, San Diego, US, ⁶Dana-Farber Cancer Institute, Boston, US, ⁷The University of Texas MD Anderson Cancer Center, Houston, US, ⁸Northern Arizona University, Flagstaff, US, ⁹University of Hawaii Cancer Center, Honolulu, US, ¹⁰Northwestern University Feinberg School of Medicine, Chicago, US, ¹¹Center to Reduce Cancer Health Disparities, National Cancer Institute, Bethesda, US, ¹²Ponce Health Sciences University, Ponce, Puerto Rico, US, ¹³The City College of New York, NY, USA, ¹⁴Morehouse School of Medicine, Atlanta, US, ¹⁵New Mexico State University, Las Cruces, NM, USA, ¹⁶Vanderbilt University Medical Center, Nashville, TN, USA, ¹⁷Keck School of Medicine of USC, Los Angeles, CA, USA, ¹⁸Florida A&M University, Tallahassee, FL, USA, ¹⁹Tuskegee University, Tuskegee, AL, USA, ²⁰O'Neal Comprehensive Cancer Center at the University of Alabama at Birmingham, Birmingham, AL, USA.

Introduction: Comprehensive Partnerships to Advance Cancer Health Equity (CPACHE) aim to create stable and long-term partnerships between minority serving institutions and NCI designated Cancer Centers. All CPACHEs are expected to achieve the following objectives: 1) Increase participation of minority serving institutions and underrepresented students in the nation's cancer research and training enterprise; 2) Produce more competitive grant applications from underrepresented scientists; 3) Increase competitive research capacity at minority serving institutions; 4) Increase involvement and effectiveness of cancer centers in research and training related to underserved populations; 5) Develop more effective research, outreach, and education programs that will have an impact on health disparity populations; and 6) Enhance research in cancer health disparities at cancer centers. Evaluation is a key component to successful and sustainable partnerships. In recent years, funding agencies have called for a collaborative approach among partnerships. This abstract describes collaborative efforts undertaken to implement a participatory evaluation plan for CPACHEs. Methods: During a grantee workshop in July,

2018 Principal Investigators determined it was imperative to develop common metrics to support individual partnership evaluation and enable a better understanding of the CPACHE program nationally. A taskforce comprised of evaluators from each partnership and one NCI Program representative was established. The goals of the taskforce were: 1) To develop an integrated evaluation matrix with process and impact outcomes for each of the six objectives 2) To share best practices and resources for tracking, measuring and reporting progress toward each objective. Results: During a six month period, the CPACHE taskforce has made significant progress toward achieving its goals by: 1) Establishing communication channels, including a mailing list and monthly conference calls; 2) Mobilizing each partnership to develop a program specific evaluation matrix; 3) Developing an integrated evaluation matrix utilizing common metrics; 4) Using an NIH-supported online platform to exchange tools used for tracking and measuring outcomes; 5) Vetting the evaluation matrix with leadership at NCI and individual program PIs; 6) Utilizing surveys to facilitate discussion and inform best practices; and 7) Establishing a model of shared participation by allowing taskforce members to facilitate meetings, and discuss objectives one at a time. Conclusion: The collaborative development of CPACHE performance standards will help each partnership conduct more relevant and effective cancer research, training, outreach, and education aimed at advancing cancer health equity. Significant engagement, participation, and commitment from all stakeholders is critical for a successful evaluation process. Implementation of the evaluation matrix will inform NCI evaluation focused on the impact of the CPACHE program.

D042 Perceptions and barriers to physical activity among Latino adults. [Rosenda Murillo](#), Mariana Vazquez, Isabel M Leal, Daphne C Hernandez, Lorraine R Reitzel. University of Houston, Houston, TX, USA.

Introduction: Latino adults are less likely than their non-Latinos counterparts to meet physical activity recommendations. Perceptions (e.g., physical activity is important for health) and barriers to physical activity (e.g., lack of time, lack of energy) have been examined among Latinos; however, less is known about how perceptions and barriers differ from childhood to adulthood among Latinos. Further, identifying perceptions and barriers to physical activity in childhood and adulthood among foreign-born Latinos may provide further insight into how immigration to the US influences physical activity, given the unique experiences of immigrants. The objective of this study was to utilize a qualitative approach to identify perceptions and

barriers to physical activity in childhood and adulthood among Latino adults. Methods: Twenty-six participants were recruited from Southeast Houston, TX between September–December 2018. Participants were individuals that self-identified as Latino and between the ages of 21-36. Five focus groups and one one-on-one individual interview were conducted in English and Spanish using semi-structured interview guides, audio recorded and transcribed by bilingual researchers. Atlas.ti 8 was used to facilitate data management. Thematic analysis employing inductive and deductive coding was used to code, categorize and summarize data into themes. Results: Data analysis yielded themes relevant to perceptions and barriers to physical activity in Latinos. Participants mentioned that the presence and lack of family support influenced their physical activity in both childhood and adulthood. Responsibilities particularly in adulthood (e.g., work, caregiving) were cited as barriers to engaging in physical activity. The participants also expressed that in adulthood they perceived physical activity important for their health. Participants also mentioned that they found physical activity enjoyable in both childhood and adulthood. Lastly, foreign-born participants cited a different way of life in the US, compared with life in their countries of origin, (e.g., living in walkable areas in their country of origin versus living in unfamiliar and less walkable areas in US, lack of social ties in US) as barriers to physical activity. Conclusions: Participants mentioned commonly reported perceptions and barriers to physical activity by Latinos. Additionally, foreign-born participants also expressed that changes in physical environment and social ties had an impact on their physical activity. This study helps fill the gap in research on understanding the perceptions and barriers to physical activity experienced by Latinos in the US. Study findings should be considered in the development of culturally-tailored interventions to promote physical activity among Latinos.

D043 Éxito!: Building a new pipeline of Latino doctors and cancer researchers. [Arely Perez](#)¹, Daniel C. Hughes¹, Rena Pasick², Amelie G. Ramirez¹. ¹UT Health San Antonio, San Antonio, Texas, USA, ²University of California, San Francisco, San Francisco, California, USA.

Introductory sentence with purpose of study: The Éxito! Latino Cancer Research Leadership Training (Éxito!) program was developed to encourage Latino master's level students and graduates to pursue a doctoral degree and career in Latino cancer health disparities (CHD) research. Cancer is the leading cause of death among Latinos who represent 18% of the population. However, similar to under-represented groups

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there is a disproportionate representation at the terminal degree level. Thus, it is imperative that the next generation of health practitioners and researchers is representative of the diverse U.S. population and that culturally competent solutions are implemented to eliminate cancer related CHD among all ethno-cultural groups especially Latinos. Brief description of pertinent experimental procedures: Twenty-five selected participants are invited to complete an intense five-day Summer Institute (SI). The SI is led by successful Latinx researchers and Latinx role models. For the week, trainees are immersed in intense interactive learning activities, presentations on succeeding in academia/research, on how to obtain funding and tips/tools for applying and overcoming barriers in completing a doctoral degree, specific for Latinx students. Ten, 6-month internships in Latino CHD research are then available for SI alumni annually. Evaluation is done through change (“post-pre” SI training) in Social Cognitive Theory based constructs of academic self-efficacy and confidence in overcoming barriers. Alumni are monitored through acceptance and completing doctoral programs. Summary of the new published data: In nine years, 200 individuals have completed SI training and 49 internships have been awarded. SI training has been associated with a significant improvement in academic self-efficacy ($p < .001$) as well as significant improvement in attendees’ confidence toward obtaining a doctoral degree ($p < .001$). Internship experiences have improved research skills ($p < .001$). 23% ($n=46$) of alumni are enrolled in a doctoral program. Eight have graduated with two more anticipated this summer. Statement of conclusions: *Éxito!* is an excellent model increasing the pipeline of Latino doctoral graduates and cancer researchers. Despite differences within Latinx cultures, *Éxito!* proves that with a shared Latinx ethnicity, students encounter very similar obstacles/concerns in continuing their education, in part because of cultural incongruence. *Éxito!* is framed in cultural congruence. The application of which in academia is a key concern for under-represented ethno-cultural students seeking higher education. The cultural congruence components of the *Éxito!* model in are generalizable to other under-represented groups as well to model not only demonstrated success in increasing the pipeline of Latinx researchers but other underrepresented biomedical researchers as well.

D044 Age and sex effects on quantitative sensory testing values in healthy African American adults. Keesha L. Powell-Roach¹, Starja Q. Booker¹, Yingwei Yao¹, Marie L. Suarez², Miriam O. Ezenwa¹, Roger B. Fillingim¹, Zaijie J. Wang², Robert E. Molokie², Diana J. Wilkie¹. ¹University of Florida, Gainesville, FL, USA, ²University of Illinois, Chicago, IL, USA.

Introduction: Only a few studies have reported quantitative sensory testing (QST) reference values for healthy African Americans, and those studies are limited in sample size and range of age of participants. The intent of our study was to fill a gap in the understanding of pain and somatosensory function in African Americans by generating QST values for healthy African American adults. In a large cohort of pain-free, healthy African American adults whose past pain experiences and current psychological status were known, our study aim was to determine thermal and mechanical QST values and compare those values at the anterior forearm by age and sex. We also determined the values for 5 other body sites and compared the values for differences by testing site location (upper body versus lower body). Methodology: In this cross-sectional study, 124 pain-free African American adults (age 18 to 69 years, 49% female) completed demographic and self-reported pain, fatigue and psychosocial measures. QST included obtaining thermal and mechanical responses and associated pain intensity levels. We applied the Benjamini-Hochberg procedure to adjust the p values to account for the multiple t tests. Results: We found thermal detection values at the anterior forearm were ($29.2^{\circ}\text{C}\pm 1.6$) for cool detection (CD) and ($34.5^{\circ}\text{C}\pm 1.2$) for warm detection (WD). At that site, pain thresholds were: cold pain threshold (CPT_h) ($26.3^{\circ}\text{C}\pm 5.0$), heat pain threshold (HPT_h) ($37.8^{\circ}\text{C}\pm 3.6$), and mechanical pain thresholds (MPT_h) (16.7 ± 22.2 grams of force, gF). There was a significant between sex difference for WD, with women being more sensitive ($q=0.027$). Lower body sites were less sensitive than upper body sites across all thermal modalities ($q<0.003$), but not for the mechanical modality. Mean pain intensity scores rated immediately after the CPT_h and HPT_h were 1.9 ± 1.3 to 2.2 ± 1.2 on the 0-10 pain intensity scale. Similarly, after the MPT_h tests the mean pain intensity scores were 0.5 ± 0.5 to 0.8 ± 0.6 . These scores did not differ significantly by sex or age group and clearly indicate that the participants reported pain threshold at an appropriately low perceptual intensity. Pain intensity values for past pain experiences and low ratings for fatigue, depression and anxiety indicated that these factors were unlikely contributors to their pain threshold reports. Conclusion: The QST values from this protocol at the anterior forearm indicate that healthy African American adults had average thermal pain thresholds within 6°C of the temperature of adaptation and average MPT_h under 20 gF. Differences in responses to thermal and mechanical stimuli for upper versus lower body were consistent with prior research. These findings add to the body of literature confirming that African American adults indeed have lower pain thresholds than those reported for White adults. These QST values can be used as controls for African Americans with cancer to understand the neuropathic

pain syndromes associated with tumor progression and cancer treatments.

D045 Content analysis of online media coverage of the human papillomavirus vaccine as a school-entry policy in Puerto Rico.

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Introduction: In August 2018, Puerto Rico (PR) adopted a Human Papillomavirus (HPV) vaccine school-entry policy, required for students, 11-12 years old. Previous research suggests that influence from media coverage and content might impact parents' perception of vaccine efficacy, safety and willingness to vaccinate their children. We analyzed the coverage related to the implementation of the HPV vaccine in PR as a requirement for school-entry policy. **Methods:** A systematic review was conducted from January 2017 through December 2018. Search terms (in Spanish) included: Virus de Papiloma Humano, VPH, vacuna, vacunación contra VPH, implementación, among others. The search included 17 online websites; 34 articles were gathered, which were included if coverage of the new school entry-policy was mentioned in the content. The following steps were developed to review the content of the articles: 1) a matrix to evaluate the content of the article in relation to the school-entry policy and 2) qualitative analysis using grounded theory approach. Since headlines might promote readers' perception, three different

readers read the article title to document the sentiment (positive, negative or neutral). Fleiss' Kappa analysis was used to assess intra-rater agreement. Results: Data from the matrix showed that 79% focused on this new school-entry mandate as a policy for cancer prevention and 61% of the news articles did not discuss the HPV doses required. Media reports highlighted the link between HPV and HPV-related cancers, mostly cervical cancer (59%). Limited information regarding other HPV-related cancers such as vaginal (18%), vulvar (20%), anal (12%), penile (21%) and oropharynx (24%) was included. In 2017, prior to policy implementation, news coverage focused mostly on the description of the school-entry policy, while 2018 coverage focused on the controversy of the school policy being mandatory. Most of the emergent themes related to the implementation of the HPV vaccine as a school-entry policy were negative, involving: 1) risk of the vaccine (safety and efficacy); 2) representative hesitancy; 3) parental autonomy; 4) right to be informed; and 5) lack of education about HPV and the vaccine. Positive content included: 1) knowledge and acceptance of the HPV vaccine for cancer prevention; 2) the importance of education and protective sexual behaviors; 3) support from coalitions, health providers and government representatives for implementation. The agreement of the headline sentiment between the three raters was fair ($k = 32\%$; $p < 0.01$). **Conclusion:** Most of the media coverage about HPV in PR had limited information related to the vaccine, HPV, and HPV-related cancers. Weak concordance of the headline's sentiments shows how different headlines influence the total impression created by a news story. In the case of HPV and this new policy, this situation could influence negatively public concerns regarding the new school-entry policy, as well as HPV vaccination rates in PR.

D046 Supportive care needs in diverse cancer patients treated at a Comprehensive Cancer Center.

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Introduction: Disparities persist related to supportive care

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interventions across the cancer continuum for racially and ethnically diverse patients. To meet these unique needs and mitigate the complexities of cancer care, we developed a non-nurse Population Health Navigator (PHN) program to reduce barriers to timely, quality care among traditionally underserved populations. The PHN is a novel approach to address concerns expressed by the community as part of a targeted outreach and engagement strategy by providing culturally and linguistically concordant navigation to reduce barriers to care, increase knowledge and awareness of clinical trials, and address supportive care needs. Methods: We purposively sampled patients presenting for oncology care to enroll a diverse sample with regards to race, ethnicity, insurance coverage, age, and cancer type. Participants completed a single interviewer-administered survey regarding their patient experience, including the 34-item Supportive Care Needs Survey assessing adult cancer patients' perceived needs (Boyes et al., 2009). Race and ethnicity were self-reported at time of survey completion. ANOVA and chi-square/Fisher's exact tests compared responses of non-Hispanic White (NHW), non-Hispanic Black (NHB), and Hispanic patients. Results: A majority of survey participants (N=247; participation rate 85%) were female (54.5%) and currently receiving active treatment (60.5%) with a median time since cancer diagnosis of 2.8 years. The racial and ethnic distribution of the sample was 50.6% NHW, 27.3% NHB, and 22.3% Hispanic. Hispanics were more likely to report less than a high school education (47.3% vs 10.4% NHW and 17.9% NHB) and not having enough money to meet the daily needs of their families (45.5% vs 13.6% NHW and 17.9% NHB), $p < .001$. Common cancer types included hematologic (36.4%), breast (20.7%), gastrointestinal (12.6%), and thoracic (9.3%). Hispanic patients indicated a statistically significant greater need for assistance with patient care and support ($p = .0012$) and health system and information needs ($p < .0001$). There were no significant differences in physical and daily living, psychological, and sexual needs ($p > 0.10$) between racial and ethnic groups. Conclusion: Among patients seeking care at the Wake Forest Baptist Comprehensive Cancer Center, differences in supportive care needs were identified for certain racial/ethnic populations. Implementation of a PHN program with non-nurse navigators may be a cost-effective way to provide culturally and linguistically appropriate support for patients with cancer, allowing for programmatic work to be responsive to the needs of underserved communities and ultimately helping to reduce cancer disparities.

DO47 Human papillomavirus school-entry vaccination mandate in Puerto Rico: Barriers and facilitators from the perspective of key informants.

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Introduction: School-entry vaccination mandates have been widely used as a mechanism to ensure high immunization coverage rates. In August 2018, Puerto Rico (PR) mandated a Human papillomavirus (HPV) vaccine school-entry policy for student's ages 11 to 12 years. This new requirement in PR presents an opportunity to study the implementation process across a 5 years period (2018-2023). In this ongoing study, we conducted Key Informant (KI) interviews to document factors that facilitate or impede a successful HPV vaccine school policy implementation in PR. Methods: We conducted 29 KI semi-structured interviews with stakeholders in the Department of Health (DOH), school system, healthcare organizations, community-based organizations and coalitions in PR (in favor and against the school-entry policy) from July 2018 to June 2019. The interview guide included relevant domains based on the Consolidated Framework for Implementation Research, such as Intervention characteristics, Inner setting, Outer setting and Individual characteristics. We transcribed interviews, coded transcripts and analyzed data to identify emergent themes. Results: Potential facilitators of HPV policy implementation included: clear enforcement messages and use of personal anecdotes by nurses from health and school fields, the coverage of the vaccine by medical insurers, and the power of the Secretary of Health to include vaccines required for school-entry.

Perceived barriers to the implementation process were: lack of communication between the DOH and the Department of Education, lack of knowledge about the HPV vaccine, uncertainty about the consistency of implementation in schools, lack of vaccine availability and disproportionate burden for regional school nurses. Other barrier to implementation mentioned included: school directors and teachers were detached from the implementation process, and lack of compliance from private health providers and public schools towards the immunization registry. Coalitions against this mandate focused their concerns on the right of parental autonomy. Recommendations from KI focused on: stricter policies to enforce this law in public schools, clear messages about the new mandate and HPV vaccine current coverage by health care insurers in PR. Moreover, KI expresses the need for more support from the DOH (technical and educational training to school principals and teachers, health promotion), and the need for increased education about the HPV vaccine and recommendations. Conclusions: Although school vaccination mandates are an evidence-based strategy for improving vaccination rates, several implementation barriers could affect the impact. Findings from this study can be used for improving policy procedures and implementation, and can inform states/territories considering adopting similar immunization policies. The information generated will help determine adaptations/modifications that may be needed for policy implementation in PR and other populations in the future.

D048 Social support, quality of life and mental health factors affecting Filipino cancer survivors. [Annalyn Valdez-Dadia](#). California State University, Dominguez Hills, Carson, CA, United States.

Background: Cancer survivorship rates are increasing and the growing number of cancer survivors will present new challenges to the health care system with regards to follow-up care and long-term health care needs. More specifically, cancer survivors are dealing with the physical and mental health consequences of cancer long after treatments are completed, and many of the physical symptoms and side effects that evolved from such treatments have had long-lasting physical and psychological effects. Studies aimed at understanding how social support and quality of life impacts survivorship is limited and there is a paucity in research investigating factors that affect the health-related quality of life and the long-term health care needs of Filipino cancer survivors. Significance: Physical symptoms of cancer survivors can be detected and treated by health care providers, but any psychological distress experienced

by these individuals are not easily identified or assessed. Depression and anxiety are common among individuals diagnosed with cancer and many survivors often report experiencing emotional distress and feelings of abandonment after intensive support during the treatment phase. Objective: This study aims to explore the cultural perceptions of mental health, identify the types of social support that impacts the psychological well-being of Filipino cancer survivors post-treatment, and explore the health-related quality of life and prevalence of psychological distress among Filipino cancer survivors. Methods: Individual, semi-structured interviews were conducted with 10 Filipino cancer survivors residing in Southern California. Thematic analysis was performed to explore and identify cultural perceptions of social support, quality of life and mental health. Results: This exploratory study found that post-treatment needs of Filipino cancer survivors vary by cancer type and treatment received. Although social support (physical and functional) is available, lack of emotional support increases psychological distress and may affect their overall quality of life. Physical health problems are easily identified and readily addressed, but the mental well-being of survivors is often overlooked and rarely discussed. Discussion/Conclusion: Further investigation of post-treatment experiences of Filipino cancer survivors is needed in order to identify the services and resources that would be most beneficial in addressing the emotional support and psychological distress needs during survivorship.

D049 Establish patient-derived pancreatic cancer cell organotypic models for personalized drug treatment. [Bo Han](#)¹, [Shuqing Zhao](#)¹, [Edward Agyare](#)², [Jose Trvino](#)³. ¹University of Southern California, Los Angeles, CA, USA, ²Florida A&M, Tallahassee, FL, USA, ³University of Florida, Gainesville, FL, USA.

Pancreatic cancer (PCa) can vary between individuals, chemotherapy should ideally be tailored to each patient based on the nature of their disease. The detection of potentially chemo-sensitive tumors would significantly improve response rates and facilitate the selection of effective individualized regimens. Developing a method of assessing the likely effectiveness of anticancer drugs using resected tumors of Blacks and whites before treatment will provide PCa patients with a survival advantage. Therefore, we seek to set up patient derived pancreatic cancer organotypic model to test the drug sensitivities. Four patient-derived primary cancer cells from surgically resected Black (2) and White (2) PCa patients were embedded into 3D matrix containing different concentrations of gelatin matrix (3-9%) and transglutaminase (0.1-1.0mg/ml) to mimic tumor

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microenvironments. Highly and low/dormant 3D conditions were defined based on the cell proliferation rates determined by CCK-8, MTT, and live/dead assays at day 2, 7, 14 days. Cell morphology, colony formation and matrix remodeling were recorded by live imaging due to the 3D matrix transparent nature. Commonly used pancreatic cancer treatment chemo drugs Gemcitabine (Gem), 5-Flu, Capecitabine together with our newly developed Stearoyl-Gem were tested for drug sensitivities in both 2D culture and 3D organotypic cultures. Cell viability, apoptosis, ROS expression, and ATP level in all treatment conditions were imaged and quantitated. The tumor organotypic model mimic two traits of pancreatic tumor microenvironment, including dense extracellular matrix and high transglutaminase expression. Patient derived cancer cells showed significant differences in cell morphology, proliferation, cluster formation in different stiffness microenvironment. We observed patient specific drug sensitivity in 3D cultures. In general, the drug C50 in 3D was shift to higher concentrations when compared with 2D culture. Spontaneous forming tumoroid further in-sensitize drug treatments if we postponed treatment after cell embedding time extended from 48 hours to 144 hours. The cells exhibited delayed drug responses in 3D when compared post treatment 3-day results to 6-day results. Newly developed Stearoyl-Gem showed higher drug potency when compared with Gem. The established patient-derived primary cancer organotypic model provides a platform for testing therapeutic drugs at tumor cell competent and/or dormant conditions. The high throughput 3D model closely mimics tumor microenvironment and may provide a quick turn-around and cost-effective information for patient treatment.

D050 Enhancing efficacy of modified-gemcitabine

nanoparticles in pancreatic PDX model. Tiara King¹, Taylor Smith¹, Kevin Affram², Jose Trevino³, Bo Han⁴, Edward Agyare¹, [Andriana Inkoomb](#)¹. ¹Florida A&M University, Tallahassee, Florida, USA, ²FDA, Silver Spring, MD, USA, ³University of Florida, Gainesville, FL, USA, ⁴University of Southern California, Los Angeles, CA, USA.

Gemcitabine (Gem) is preferred anticancer drug for the treatment of pancreatic cancer (PCa) either alone in debilitated patients or in combination with other drugs in healthy patients, however; the therapeutic concentration of Gem is severally reduced due to rapid metabolism. Due to its short stay in the blood, the maintenance of therapeutic concentrations of Gem requires a continuous parenteral administration leading to severe side effects such as renal and hematological toxicities. This inherent drawback has necessitated novel approach of delivering Gem to improve

stability. The objective of this study was to chemically modify Gem and evaluate its anticancer activity against pancreatic cancer cells. Gem was modified by linking 4-amino group of Gem and stearyl linear acyl derivative to form 4-(N)-stearoyl-gemcitabine (Gem-stearate). Gem-stearate nanoparticle (GSN) was further prepared by mixing lecithin and labrasol solutions until homogenous mixture was formed. Gem-stearate was then added to the mixture and vortexed intermittently until homogenous solution was achieved. The bond between 4-amino group of Gem and stearyl derivative was confirmed by Nuclear Magnetic Resonance (NMR) and micro-elemental analysis. The particle size of GSN was determined by using a Particle Size Analyze. Patient-derived primary pancreatic cancer cells (CMZ and G46Ca) and MiaPaCa-2 cells were treated with blank nanoparticles and different concentrations of free Gem and GSN for 48 hours and determined the viability by using Resazurin assay. Mice with pre-established tumors (patient-derived xenografts (PDX)) of pancreatic model (G46Ca) were treated with Gem and GSN. Results: Analysis of the H-NMR spectra displayed amide bond single peak of interest was at 11ppm suggesting a bond formation between 4-amino group of Gem and stearyl derivative. The mass fractions of elements of GSN were found to be (Theory (T) and Found (F)): i) Carbon: 61.23% (T) and 60.97±0.07% (F), ii) Hydrogen: 8.56% (T) and 8.59±0.08% (F), iii) Nitrogen: 7.93 % (T) and 7.52±0.01% (F) and iv) Fluorine:7.17% (T) and 6.94±0.02% (F)). Growth inhibition of GSN-treated CMZ culture (IC50 =21±5µM) was remarkably higher than free Gem treated CMZ culture (IC50 = 62±3 µM). Similar trend of higher GSN inhibitions in G46Ca and MiaPaCa-2 cultures were found (IC50 =46±16 µM; IC50 =27±4 µM) respectively compared with free Gem treated G46Ca and Mia-PaCa-2 culture (IC50 =68±26 µM; IC50 =54±52 µM) respectively. Put together, the anticancer activity of GSN nanoparticle was significantly more effective than free Gem in CMZ, G46Ca and MiaPaCa-2 cultures compared with their corresponding free Gem treated cultures. For the tumor efficacy studies, GSN exhibited significant tumor growth inhibition compared with molar equivalent dose of free Gem. Immunohistostaining showed that GSNs have significant antiproliferative activity in G46Ca tumors. Conclusion: This study reveals that GSN may be a novel approach in delivering an effective and stable Gem to treat pancreatic cancer.

D051 Targeting ubiquitin receptor ADRM1 for the treatment of quadruple-negative breast cancer. [Balasubramanyam](#)

[Karanam](#)¹, Ravi Anchoori², Richard Roden², Clayton Yates¹. ¹Tuskegee University, Tuskegee, AL, USA, ²Johns Hopkins School of Medicine, Baltimore, MD, USA.

Quadruple Negative Breast cancer (QNBC) is a subtype of Triple Negative Breast Cancer (TNBC) with loss of Androgen receptor (AR). We determined the expression of AR and its relationship to breast cancer subtypes, using Gene Expression Omnibus (GEO) profiles that contained racial and clinical outcomes data totaling 1061 patients. Expression of the AR protein level was confirmed in an additional multi-institutional cohort of 197 breast cancer patients, for a total of 1258 patient evaluated. Relative to White women, African American women had higher percentage (81%) of AR-negative tumors, and, for both races, AR-negative tumors correlated with the basal subtype, a shorter time to progression, and worse overall survival (OS) compared to White women. Currently available treatments are unable to eradicate metastatic breast cancer (TNBC and QNBC), and median survival for these patients is only 2–4 years. Improving the survival rates for metastatic disease has been the subject of intense investigation, and new agents and strategies are actively being evaluated. Targeting the UPS (Ubiquitin-proteasome system) with small molecules can an effective can cancer therapy. We have developed an orally-available proteasome inhibitor bis-benzylidene piperidone (RA190), that binds to the ubiquitin receptor RPN13/ADRM1 on the 19S regulatory particle of the proteasome and directly kills cancer cells by triggering proteotoxic stress. The objective of this study is to investigate the expression of ADRM1 in QNBC patients and target ADRM1 with RA190 for the treatment of QNBC., We used forest plot analysis of TCGA patient samples to determine the expression of Ubiquitin receptor ADRM1, and invitro assays to find the sensitivity of RA190 against AR-positive and AR-Negative breast cancer cells. Our results indicate that ADRM1 is significantly elevated and in QNBC breast tumors of African American patients. Our cell culture data show that, AR-positive and AR-Negative breast cancer cells have differential sensitivity in IC50 values to inhibitor RA190. Our findings will advance our knowledge of vulnerable pathways in QNBC/TNBCs optimal control and reveal if this mechanism is more likely to occur in African American patients.

D052 Pharmacokinetic analysis of co-formulation of calcipotriol and paclitaxel for pancreatic ductal adenocarcinoma shows reduced systemic exposures and eliminations: Implications for safety and efficacy. [Victor R Lincha](#)

[Lincha](#)¹, Jun Zhao², Chun Li², Diana S-L Chow¹. ¹University of Houston, Houston, TX, USA, ²MD Anderson Cancer Center, Houston, TX, USA.

Introduction: The 5-year survival rate for Pancreatic Ductal Adenocarcinoma (PDAC) remains 7%. An emerging treatment strategy involves the combination of vitamin D receptor (VDR) ligands with chemotherapeutic agents to re-program the activated cancer-associated fibroblast (CAFs). Calcipotriol (CAP), a synthetic analogue of vitamin D can reprogram CAFs, but is toxic with side effects including cachexia and edema. Due to the abundance of the VDR in the body, diminished plasma exposure and elimination of calcipotriol together with enhanced accumulation in the tumor are desirable to reduce toxicity and increase efficacy. We propose to achieve this with a slow-releasing micellar nanoformulation with a well-controlled size to take advantage of the leaky tumor fenestrations and enhance delivery. Method: 8-week old male C57BL/6 mice were administered with either formulated or non-formulated single IV bolus dose of CAP and paclitaxel (PTX). Drugs from blood samples were extracted, and simultaneously quantified using validated LC-MS/MS assay. Pharmacokinetic modeling was performed with Phoenix[®] WinNonlin (8.0) using 2-compartment model. Results: Our co-formulation of CAP and PTX resulted in >2-fold decrease in plasma exposure (AUC) and 5-fold reduction of peak concentration (C_{max}) of CAP. Similarly, PTX AUC and C_{max} were halved in mice administered with the formulated drugs. The PTX total clearance (CL) was similar between both groups, but CAP CL was 5-fold lower in formulation-administered mice. Further, CAP elimination (k_{10}) from central compartment and from central to peripheral compartments (k_{12}) were 2 and >3-fold slower, respectively, in the formulation group. The reverse elimination (k_{21}) are similar. Similarly, the k_{10} of PTX was almost halved, while the k_{12} was 44-fold slower in mice receiving formulated drugs. The reverse elimination from the peripheral to the central compartment (k_{21}) for formulated PTX is almost 10 times slower than in the mice receiving non-formulated PTX. Conclusion: Our micellar co-formulation of CAP and PTX is able to reduce total clearance of these agents from the systemic circulation. Further, rate constants derived show that PTX elimination from the systemic circulation to tissues is very slow and we expect this to correlate with an extended duration of action of this drug. Finally, our formulation halved the systemic exposure and peak concentrations of CAP that should lead to a more favorable safety profile of this agent.

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Ongoing work will focus on studying the pharmacokinetics of co-formulated CAP and PTX in a larger cohort of animals and we eventually hope to demonstrate the therapeutic merits of our nanoformulation strategy in pancreatic tumor-bearing mice.

D053 Improved safety and efficacy of cancer therapies with ultra-low cost ethanol-polymer-drug injections. [Corrine A. Nief](#), Robert Morhard, Erika Chelales, Jenna Mueller, Nimmi Ramanujam. Duke University, Durham, NC, USA.

The current standard of care for most solid cancers is surgery and radiation; however, 90% of people in low-income areas do not have access to radiation or surgery (Meara JG. *The Lancet*. 2015;386:569-624). In low-resource areas, treatment is typically limited to small-molecule chemotherapies and palliative care, if available. Small-molecule chemotherapies are currently given systemically and can cause significant morbidity through off-target toxicities which are difficult to manage away from a hospital. We propose using intratumoral injection of ethanol, a slow release polymer, and small molecule drugs to specifically address the challenges of cancer treatment in low-resource settings. We show here that simple injections of ethanol and the phase-changing polymer ethyl cellulose (EC) can be used for tumor destruction and intratumoral small-molecule drug delivery. Here fluorescein (FL) is used as a surrogate for a hydrophobic small molecule drug injected in the ethanol that can be monitored with fluorescent imaging. Intratumoral ethanol injections have traditionally been difficult to control and predict due to rapid vascular clearance that can result in adverse events. However, the transition from liquid to solid of EC upon contact with aqueous solutions, such as blood, is used to block local vessels connecting the tumor from the inside out. Thus, we hypothesized that ethanol-EC-FL injections can be used to cause tumor necrosis and localize drug delivery to the tumor in a mouse model. Here, we assess improvements in safety, therapeutic efficacy, and drug delivery efficacy in a mouse model. Fluorescent imaging showed that the addition of EC significantly increases FL retention in the tumor ($p < 0.05$, $n = 20$), indicating that EC would significantly improve small molecule delivery via intratumoral injections compared to ethanol-FL alone. Ethanol-EC-FL also significantly increased tumor necrosis compared to ethanol-FL injections and untreated controls ($p < 0.05$, $n = 5$). Ethanol-EC-FL also significantly increased survival compared to ethanol alone ($p < 0.05$, $n = 5$). The addition of EC reduced the rate of local collateral damage, such as subdermal bleeding and dragging of the injected leg with the addition of EC ($P < 0.05$, $n = 10$). In summary, the polymer EC aids in the retention of ethanol and

FL at the injections site in a normalized distribution around the tumor, increasing safety, and decreasing tumor growth. These results give proof-of-concept of that ultralow cost ethanol-EC injections can act as a tumor ablation method and drug delivery platform to reduce tumor related morbidities and outcomes in the absence of radiation and surgery.

D055 Molecular mechanisms of cisplatin-induced toxicity to acute promyelocytic leukemia cells. [Paul Tchounwou](#), Sanjay Kumar, Andrea Brown. Jackson State University, Jackson, MS, USA.

Purpose: Acute promyelocytic leukemia (APL), is a blood cancer that accounts for about 10% of all acute myeloid leukemia cases. Each year in the United States, APL affects about 1,500 patients of all age groups and causes approximately 1.2% of cancer deaths. Research has also pointed out the Hispanic populations have a higher incidence of APL compared to other racial groups. Cisplatin is a widely used anti-tumor drug for the treatment of a broad range of human malignancies with successful therapeutic outcomes for head and neck, ovarian, and testicular cancers. It has been found to inhibit cell cycle progression and to induce oxidative stress and apoptosis in APL cells. However, its molecular mechanisms of cytotoxic action are poorly understood. We hypothesized that cisplatin induces cytotoxicity through DNA adduct formation, oxidative stress, transcriptional factors (p53 and AP-1), cell cycle regulation, stress signaling and apoptosis in APL cells. **Methods:** We used the APL cell line as a model, and applied a variety of molecular tools (cytotoxicity and oxidative stress assays, western blot analysis, flow cytometry, and confocal microscopy) to elucidate cytotoxic mode of action of cisplatin. **Results:** We found that cisplatin inhibited cell proliferation by a cytotoxicity characterized by DNA-adduct formation, oxidative stress, cell cycle arrest, stress signaling and apoptosis in APL cells. Cisplatin also activated p53 and phosphorylated activator protein (AP-1) component, c-Jun at serine (63, 73) residue simultaneously leading to cell cycle arrest through stimulation of p21 and down regulation of cyclins and cyclin dependent kinases (cdks) in APL cell lines. It strongly activated the intrinsic pathway of apoptosis through alteration of the mitochondrial membrane potential, release of cytochrome C, and up-regulation of caspase 3 activity by modulating p38MAPK pathway in APL cells. **Conclusion:** Overall the findings from this study provide novel targets of cisplatin mode of action that may be very useful in designing of new APL drugs.

D056 Differences in breast cancer survival by race, age, and tumor estrogen receptor status. Ewune Ewane, M Yi, A Akhtar, A M Brewster, Lorna McNeil-Haughton, Kelly K Hunt, Dallah M Black. UT Health M.D. Anderson Cancer Center, Houston, TX, USA.

Background: Breast cancer survival advancement can be ascribed to various efforts including community screening programs and educational outreach resulting in earlier diagnosis, treatment advances, and more accessible care. However, racial disparities continue to persist. Identification of populations susceptible to adverse health outcomes is substantial to construct health disparities resolutions. The purpose of the study is to identify trends in breast cancer disease specific survival (DSS) in black patients compared to white patients by age at diagnosis, year of diagnosis, and tumor estrogen receptor (ER) status. Methods: The Surveillance, Epidemiology, and End Results database was utilized to identify patients of black or white race diagnosed with stage I-III, ER positive (+) or ER negative (-) breast cancer between 1990 and 2009. The Kaplan-Meier method was used to determine 14-year breast cancer DSS. Changes in DSS were analyzed over the study's time period and in 3 age groups to evaluate women who were of pre-menopausal age (< 50 years), perimenopausal or postmenopausal and of the average age for breast cancer diagnosis (50-64 years), and elderly (65 + years). Results: The total study sample was 344,142 patients; 309,415 identified as white (89.9%) and 34,727 identified as black (10.1%) women. All patients diagnosed most recently had stable or improving DSS ($p < 0.05$). White patients with ER+ or ER- disease had significantly higher DSS compared to blacks in all age groups and years of diagnosis ($p < 0.05$); more specifically all black patients diagnosed in 2005-2009, had significantly lower disease specific survival (DSS) compared to white patients diagnosed a decade earlier in 1995-1999 ($p < 0.05$). For women 65+ with ER+ cancer, black patients diagnosed between 2005-2009 had a DSS of 86% compared to 91% in white patients diagnosed between 1995-2000. In ER- patients less than 50 years of age, black patients diagnosed between 2005-2009 had 78% DSS compared to white patient DSS of 84% within the same period. Among black patients, young women <50 years of age ER+ and ER- women aged 50-64 years had consistent and most improvement in DSS over the study's 4 time intervals; for ER+ cancer, DSS was 68% for those diagnosed in 1990-1994, 71% for 1995-1999, 75% for 2000-2005, and 79% for 2006-2009 and for ER- cancer, the DSS was 60% for those diagnosed in 1990-1994, 67% for 1995-1999, and 72% for 2000-2005, and 75% for 2006-2009 ($p < 0.05$). Conclusion: Improvements in breast cancer DSS are evidenced in black and white women, most

especially black patients < 50 years of age with ER+ and 50-64 with ER- disease. However, findings demonstrate DSS remain lower in all black patients compared to white patients, independent of year of diagnosis, age, and tumor receptor status. Continued efforts are crucial to identify and address the causes of continued disparities in breast cancer DSS, particularly in subsets of black patients not having survival improvements.

D057 Impact of antibiotic exposure on the overall survival in patients receiving immune checkpoint inhibitors: Does race matter? Armani B Hayes¹, John Allen². ¹Edward Waters College, Jacksonville, FL, USA, ²University of Florida College of Pharmacy, Orlando, FL., USA.

Background: Immune checkpoint inhibitors (ICIs) are commonly used in the treatment of multiple types of cancer. Several small studies have identified an association between antibiotic exposure and ICI failure. Furthermore, ICI failure has also been associated with decreased tumor mutation burden (TMB), with racial disparities being noted. However, to date there are no studies that have investigated the relationship of potential racial disparities and antibiotic exposure on clinical outcomes in patients receiving ICI therapy. The purpose of our systematic review and meta-analysis is to determine the impact of antibiotic (ATB) exposure on overall survival in patients receiving ICI therapy. An additional goal is to determine if racial disparities are present. Methods: We conducted a systematic review and meta-analysis utilizing PRISMA guidance of all randomized controlled trials, or observational studies that evaluated the impact of antibiotic exposure on ICI efficacy. We excluded studies that did not report overall survival. The primary outcome of this study is overall survival (OS) among ICI patients with antibiotic exposure, compared to patients who received ICI therapy alone. Secondary outcomes include response rate (RR), and progression-free survival (PFS). An a priori subgroup analysis for the primary outcome will be conducted based on race, cancer type, and specific ICI utilized. Results: A total of twelve studies (n=1,868 patients) were included in the final analysis. Among all patients, the most common reasons for ICI use were NSCLC (n=1,180), melanoma (n=316) and RCC (n=238). Among all patients, the most commonly used ICI was anti PD-1/PD-L1 (n=708), nivolumab (n=440) and pembrolizumab (n=63). Of the total patients analyzed, 446 patients (23.9%) received ATB within 6 months surrounding ICI therapy, and 1,422 patients (76.1%) did not receive any ATB surrounding ICI therapy. No studies reported ethnicity in their published results. Patients treated with ATB had lower overall survival compared to those without antibiotic exposure (ATB- 7.5 months; No ATB- 18.9 months). RR (ATB- 14.7%; No ATB 50.9%) and PFS (ATB- 2.4 months; No

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ATB- 5.1 months) were also shorter. Conclusions: ATB use was associated with less overall survival compared to non-ATB use in patients receiving ICI therapy. Our findings suggest that measures to promote reduced ATB use in patients receiving ICI therapy may help to improve clinical outcomes. No studies in the final analysis reported race and ethnicity. While it is hypothesized that race and ethnicity may play a role in ICI response, further research to evaluate the role of race and ethnicity is needed, which may help clinicians to better identify patients most likely to benefit from ICI therapy.

D058 Truth Talking Tour: Women's sexuality after

cancer. Candace Henley¹, Joanne Glenn², Vida Henderson³, Jacqueline Kanoon³, Melissa Simon⁴, Susan Hong³, Karriem S Watson³. ¹Blue Hat Foundation, Chicago, US, ²Women on Top of Their Game, Chicago, US, ³University of Illinois Cancer Center, Chicago, IL, USA, ⁴Robert H. Lurie Cancer Center Northwestern University, Chicago, IL, USA.

Background Due in part to advances in diagnosis, treatment, and early detection the number of cancer survivors in the United States is growing with an estimated 16.9 million cancer survivors and projected to increase to 21.7 million by 2029. Among the current survivor population, 8.8 million are female. Disparities in survivorship care exist, including poorer health outcomes related to sexual health impairment and stress from financial toxicity of cancer. A larger proportion of African American (AA) breast and colorectal cancer survivors experience issues related to lack of resources and information related to sexuality after cancer. The impact of breast cancer on sexuality among women is often examined, yet limited research has been conducted with AA survivors of other cancers such as colorectal cancer. Cultural considerations such as religion/spirituality and body image should be included in interventions addressing psychosocial needs of female AA cancer survivors. The Truth Talking Tour: Women's Sexuality after Cancer was created by community stakeholders to give women a safe space to talk about sexuality and cancer. **Methods** The University of Illinois Patient Brigade convened a cohort of patient-centered outcomes research (PCOR) "ready" advocates to engage in desired training, guide center leadership activities and inform research tools/dissemination strategies that can inform PCOR. The Truth Talking Tour was developed by Patient Brigade cancer advocacy leaders for women in any stage of their cancer survivorship and included active participation from community members and health care providers. Results Thirty-nine women attended the workshop held in Spring 2019 at a community location on the Southside of Chicago.

All survey respondents were AA, age range from 40 to 68, age at cancer diagnosis ranged from 25 to 63. Pre/post survey was conducted to explore impact of the convening on knowledge, priorities and needs of AA female cancer survivors. Results demonstrated that AA female cancer survivors see convening with other survivors and clinician experts as important and missing from current efforts. Results also showed that women with a cancer diagnosis are physically and psychologically challenged in their fight against cancer and face challenges with sexual identities currently unmet by survivorship care plans. Priority areas that emerged included lack of resources, lack of knowledge of providers, and lack of culturally tailored interventions for AA female cancer survivors. **Conclusions** The Truth Talking Tour survey data demonstrated additional research is needed to assess the needs of AA female cancer survivors impacted by lack of data on sexuality after cancer. Feasibility of the convening demonstrated that community-academic partnerships rooted in dialogue and data may be a great way to inform future interventions to improve sexuality after cancer among AA women. The community stakeholders leading the Truth Talking Tour have planned additional tours in the south, west and east coast.

D059 Bridge to Good Living: Thriving beyond lung

cancer in West Virginia. Stephenie K Kennedy-Rea¹, Anne Swisher¹, Adrienne Duckworth¹, Tara Miller², Salman Osmon³, Abby Starkey¹, Megan Burkart¹, Garth Graebe¹, Mary Anne Yanosik¹, Rachel Harper¹, Amy Allen¹. ¹WVU Cancer Institute, Morgantown, WV, USA, ²Charleston Area Medical Center, Charleston, WV, USA, ³United Hospital Center, Clarksburg, WV, USA.

Introduction: The goal of the *Bridge Program* is to improve the overall coordination of care, increase quality of life, and decrease the consequences of treatment for patients diagnosed with lung cancer.

Brief Description: Patients diagnosed with late stage lung cancer are often referred to supportive or palliative care programs that provide symptom management, psychosocial support and follow up, as well as advanced planning. In contrast, the needs of patients diagnosed at a curable or early stage often go unaddressed. The focus of the *Bridge Program* is to develop and implement a comprehensive survivorship program for Stage 1-3 lung cancer patients completing curative treatment.

The *Bridge Program* enrolls and assesses patients at the end of cancer treatment utilizing a multidisciplinary team approach. The Program's goal is to improve patient and

caregiver quality of life in the major life domains of physical, social, psychological, and spiritual. We see this program bridging patients from active cancer care to the next step on their journey in life. Using a multidisciplinary team approach creates an opportunity for collaboration and information sharing that leads to the development of an enhanced survivorship care plan.

Summary of Data: Between March 2017 and June 2019, the *Bridge Program* enrolled 81 patients across three locations. At the end of cancer care, 100% of these patients had at least one unmet need and nearly half had seven or more. Assessment identified a total of 540 unmet needs which resulted in 132 clinician referrals. When categorizing unmet needs into physical, practical, and emotional domains, Bridge patients identified more unmet needs in the physical category than any other. The most common referrals were for Physical Therapy and Occupational Therapy. Following enrollment into the Program, 93% of Bridge patients showed a decrease in the number of unmet needs at their first recurrence and monitoring visit.

When comparing a cohort of Bridge enrolled versus non-Bridge patients, we found that prior to visiting the Emergency Department, Bridge patients contacted their treatment team at a higher rate than non-Bridge patients and that the completion of Survivorship Care Plans was 100% for Bridge patients and only 38% for non-Bridge patients.

Conclusion: Lung cancer patients have many unmet needs following active treatment for lung cancer. The *Bridge Program* addresses a cancer that is not frequently talked about in survivorship care: lung cancer. With increased screening and improvements in treatment, we can anticipate an increase in the number of lung cancer survivors. The *Bridge Program* provides a novel patient-centered model that addresses a cohort of patients that are often older and sicker than other cancer patients.

D060 Impact of physical activity and sleep quality on quality of life in rural cancer survivors in central Pennsylvania. [Scherezade K Mama](#)¹, [Nishat Bhuiyan](#)¹, [Kathryn H Schmitz](#)². ¹The Pennsylvania State University, University Park, PA, USA, ²Penn State Cancer Institute, Hershey, PA, USA.

Purpose: Poor sleep quality is a long-term adverse effect of cancer treatment and is associated with poor quality of life (QOL). Physical activity (PA) improves sleep quality, yet rural cancer survivors are less likely to do PA and report poorer QOL than those residing in urban areas. This study evaluated the association between sleep quality and QOL among rural cancer survivors in central Pennsylvania and explored the

impact of PA on sleep quality in this underserved population. Method: Rural cancer survivors were recruited to the Partnering to Prevent and Control Cancer study, a cross-sectional study to explore factors related to PA in rural cancer survivors living in central Pennsylvania. Participants ($N=219$) completed questionnaires assessing sociodemographics, sleep quality, QOL (physical and social functioning, role limitations due to physical health and emotional problems, fatigue, emotional well-being, pain, and general health), and weekly leisure-time PA (WLPA). Independent samples t-tests were used to explore associations between poor sleep quality and QOL indicators, and logistic regression was used to explore the association between WLPA and sleep quality. Results: Participants (60.7% female; M age=64.5±12.2 years; M BMI=29.6±6.9 kg/m²) were mostly breast (30.6%) or prostate (27.4%) cancer survivors and were more than 12 weeks but less than 5 years post-treatment (90.4%). Most participants had completed college (25.7%) or less (49.5%) and reported an annual household income \geq \$40,000 (80.5%). Over half (59.7%) of rural cancer survivors reported poor sleep quality, and 57.8% were not meeting PA recommendations of \geq 150 minutes of WLPA/week. Poor sleep quality was associated with poorer QOL for all indicators ($p < .05$). Rural cancer survivors who were moderately active (OR=0.4, 95% CI: 0.2-0.8) or meeting PA recommendations (OR=0.5, 95% CI: 0.2-0.9) were less likely to report poor sleep quality, and those meeting PA recommendations were more likely to report higher QOL (OR=18.1, 95% CI: 4.1-80.3) than those who were inactive. Conclusions: Rural cancer survivors in PPCC report poorer sleep quality and QOL and engage in less PA than urban cancer survivors, contributing to cancer health disparities. Interventions are needed to increase PA in an effort to improve sleep quality and physical and psychological health. Furthermore, interventions and survivorship care plans must be designed to meet the unique physical and psychological needs of this underserved population to reduce long-term adverse effects of cancer treatment in rural cancer survivors.

D061 Long-term socioeconomic status of childhood leukemia survivors and their family in a universal healthcare coverage system: A PETALE study. [Sophie Marcoux](#), [Marie-France Raynault](#), [Caroline Laverdière](#), [Daniel Sinnett](#). Université de Montréal, Montréal, Québec, Canada.

Introduction: Financial toxicity as a side effect of cancer treatments has been well demonstrated in adults survivors, mainly in countries without universal healthcare coverage. Evidence supporting an association between socioeconomic deprivation and decreased survival for most prevalent

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adult cancer are mounting, including in various European healthcare coverage settings. As such, the relationship between cancer and socioeconomic status can generally be considered bidirectional. Although financial hardship on families during childhood cancer treatment has been demonstrated, long-term impact has been less studied. Purpose of the study: Study the long-term socioeconomic status evolution of childhood acute lymphoblastic leukemia (cALL) survivors and their family using residential aggregated data from Canadian government administrative databases. Methods: The PETALE cohort (n = 246) includes cALL survivors who were diagnosed and treated at Sainte-Justine University Health Center using DFCI treatment protocols. They participated to an extensive late adverse effects evaluation at 15.5 ± 5.2 years post-diagnosis, at an average age of 21.6 ± 6.3 years old. Patients with refractory disease, relapse or transplant were excluded from the study. Data from 1996, 2001, 2006, 2011 and 2016 Canadian government extensive population census linked to territorial codes (postal codes) were used to extrapolate socioeconomic variables. Centiles for average household income, % of single parent families, % of adults without minimal high school education completion, % of households with less than 20 000 CAD annual income and % of households under the minimum threshold of low income were compared at diagnosis and at PETALE study. Summary of findings: From diagnosis to PETALE Study, most families maintain (54.6%) or improve (33.5%) their socioeconomic status. However, for 1 out of 5 families (21.6%) suffer from a decrease in average household income. Age at diagnosis, participant gender and radiotherapy as part of the treatments do not alter outcomes. Excluding participants > 20 years old at PETALE (i.e. analyzing only families were participants can be assumed to live with their parents) did not change findings. Conclusions: Although ecological fallacy cannot be excluded, the ratio of precarious families does not seem to increase in a sustained way once non-complicated (no relapse, no graft) survivorship is achieved. The universal healthcare coverage and various financial supportive policies (example: financial assistance programs for handicapped children) and other public policies for kids and adolescents in Québec (Canada) could explain these findings.

D062 Mechanistic insights into phase 1b/2 study of chitosan for pharmacologic manipulation of AGE (advanced glycation endproducts) levels in prostate cancer patients. [Shanora G Brown](#)¹, Brandon Sutton¹, Taiwo Biotidara¹, Dave Turner², Robert Wilson², Michael Lilly². ¹South Carolina State University, Orangeburg, SC, USA, ²Medical University of South Carolina, Charleston, SC, USA.

Lifestyle choices have long been known to have a major role in the development or prevention of cancer. Diet, chronic stress, smoking, poverty, physical activity, and socioeconomic variables are recognized as significant factors in prevention of cancer. Increasingly, these behaviors are studied as variables that affect cancer survivorship and response to treatment as well. One general mechanism through which diet could affect cancer growth is through promoting or inhibiting the accumulation of advanced glycation endproducts. Advanced glycation endproducts (AGEs) are reactive metabolites produced as by-products of sugar metabolism and oxidative stress. Furthermore, among PCa patients, AGE accumulation is higher in blacks with African ancestry (AAs) than in European Americans (EAs). As AGEs appear to promote cancer survival and growth, interventions to limit their accumulation may be viewed as potential cancer therapeutic agents. Chitosan, a polysaccharide obtained from shellfish or mushrooms that is thought to be poorly absorbed, directly binds AGE-modified proteins in aqueous solutions. No studies to date have demonstrated that chitosan can reduce either serum or tissue levels of AGEs in humans with AGE-related diseases. The investigators are conducting a Phase 1, assay-guided trial of chitosan in patients with prostate cancer on ADT and propose that chitosan will act as an absorbent of pre-formed AGEs, preventing their absorption from the gut and thus reducing their levels in the body. This intervention produced an 80% reduction in the plasma level of carboxymethyl lysine (CML) AGE adducts and more remarkably there was also a reduction in tissue AGE levels as determined by skin autofluorescence. These data support the idea that chitosan could be an active AGE-reducing agent that is clinically tolerable. Plasma and stool bio-fluid specimens have been collected from the four patients enrolled in the clinical trial and will be assayed. As these mechanistic studies are ongoing, the result will document any systemic effects from the chitosan intervention on inflammation, bowel permeability and microbiome diversity.

D063 Intratumoral macrophage analysis and characterization of HER2+ pretreatment breast tumor biopsy using multiplex immunofluorescence. [Emmaly D Gutierrez](#), Christina Preece, Alison Stopeck, Patricia Thompson. Stony Brook University, Stony Brook, NY, USA.

Background: Latinas in the US experience overall worse breast cancer (BC) survival than non-Latinas. Higher rates of aggressive BC subtypes including estrogen receptor negative(ER-) and HER2+ in Latinas are partly suspected. High intra-tumoral immune cells including myeloid suppressive M2 type macrophages (MAC) that suppress

tumor immune responses are positively associated with poor outcomes and low response to therapy. Unclear is if tumor associated immune cells differ by race/ethnicity. Objective: To develop and evaluate the performance of a multiplex immunofluorescence (IF) methods to classify tumor-associated macrophages (TAM) as M1 and M2 in HER2+ breast tumors. Methods: Two panels of three antibodies were studied in HER2+ breast cancer biopsy specimens (n=19 patients). Two myeloid panels targeting CD80, CD68, CD163, CD206 with a nuclear (DAPI) and tumor cell (cytokeratin 8/18) was investigated. Banked breast tumor tissues were deparaffinized, and stained using indirect multiplex IF. Each tissue underwent multiple staining for CD206, CD68, and CD163 with stripping. A tyramide signal amplification IF (Perkin Elmer) was used in fluorescent labeling. Whole slide analysis image analysis was performed using HALO image analysis software. Results: All biopsy tissues yielded high quality IF profiles. Analyses per patient tumor (i.e., 5 regions of high tumor cell density containing a minimum of 5000 nucleated cells) revealed a fairly homogeneous MAC profile. In contrast, significant between patient heterogeneity in intratumoral M2 MAC density and differences by ER status was observed. In this sample, Her2+ BCs contained a high intratumoral TAM content – i.e., mean 27% (range <1% to 70%) of cells in tumor dense regions were positive for the pan MAC marker CD68+. Further, intratumoral CD68+ cells (all MAC) were slightly higher in abundance in ER-/HER2+ tumors at 31% compared to 20% in ER+/HER2+ tumors. Further, the relative abundance of CD68+/CD206+ cells (M2 type) in tumor rich regions showed a high degree of variability between cases with a mean 7.1% of total cells (range 0 to 48%). Notable, the relative abundance of double CD68/CD206 cells was higher in the ER+ tumors at 8.8% (range 0 to 48%) compared to 3.3% in ER- that showed a narrow range of 0 to 8%. A similar pattern was observed for the CD68/CD163 double positive M2 type that included large heterogeneity between patients and higher abundance in ER+/HER2+ tumors. In contrast, while exhibiting high heterogeneity between patients, the triple positive CD68, CD163, CD206 cells population appeared to be proportionally higher in ER-/HER2 tumors. Ongoing work includes characterization of the M1 type MAC and their relative abundance in HER2+ tumors by ER status. Conclusion: These results demonstrate the feasibility of multiplex IF to characterize TAM subsets in patient derived BC tissues. Future efforts will include relating TAM to HER2 targeted therapy response rates and examination of differences in TAM profiles in patient populations by race/ethnicity.

D064 Race-related RNA splicing dysregulation of PI3Kd signaling: A therapeutic target for aggressive prostate cancer.

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Background: Age-adjusted incidence and mortality rates for prostate cancer (PCa) among African Americans (AAs) are greater than among whites. The more aggressive characteristics of PCa in AAs contribute to the disparity, in addition to social determinants of health. Prior work has shown race-related differential RNA splicing of PI3Kd in PCa tissue and a novel short RNA splice variant of PI3Kd enriched in PCa from AAs. This variant drives PCa aggressiveness and associates with poorer survival for PCa. PCa cells engineered to overexpress the PI3Kd variant enriched in PCa from AAs are resistant to CAL-101, a PI3Kd inhibitor, and those overexpressing the PI3Kd variant enriched in PCa from whites are sensitive to CAL-101. Available inhibitors that target race-related RNA splicing dysregulated pathways in PCa represent potential novel therapeutic strategies for aggressive PCa.

Methods: We identified a panel of PI3Kd inhibitors of varying subunit specificity, which are available and/or currently being tested in other diseases. A panel of non-engineered PCa cell lines derived from AAs or whites were treated with the inhibitors and resulting alterations in proliferation were assessed using an Incucyte Live-Cell Imaging System. The cell lines were tested for baseline RNA and protein levels of total PI3K and levels of each PI3K subunit. After treatment, cells were tested for RNA levels of targets in pathways that cross talk with the PI3K pathway and downstream targets of PI3K signaling.

Results: The seven non-engineered PCa cell lines derived from AAs or whites varied in PI3Kd subunit expression across a 60-fold range. A panel of seven PI3Kd inhibitors varied in subunit specificity for PI3Kd, with PI3Kg (lowly expressed) being the most common secondary target. Specificity for all other subunits ranged from 5-19,000x relative to PI3Kd IC50. LNCaP and LN95 cell lines had the highest baseline expression of PI3Kd and the largest inhibition of proliferation in response to the highly PI3Kd-specific inhibitors, piasalisib and idelalisib, whereas 22RV1, MDA PCa 2b and VCaP cell lines had the lowest baseline expression of PI3Kd and the smallest response to the highly PI3Kd-specific inhibitors. However, none of the cell lines exhibited sensitivity to umbralisib, a highly PI3Kd-specific inhibitor, suggesting that subunit baseline expression is not the only factor determining sensitivity. All cell lines exhibited marked proliferation inhibition in response to copanlisib and LY3023414, which have less subunit specificity and/or known off-target effects.

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Further studies of effects of these inhibitors on oncogenic signaling and PCa cell biology are underway, including evaluation of inhibitor activity in PCa patient-derived xenografts derived from AAs or whites.

Conclusions: PI3Kd inhibitors have a potential therapeutic role in PCa dependent on the PI3K subunit status of the tumor. PI3Kd inhibition has potential as a novel therapeutic strategy to improve outcomes for men with PCa driven by this mechanism.

D065 Investigating the Interplay of monocytes in the tumor microenvironment of glioblastomas. Maryam Tayyab, Maame Gyamfi, Michael Caponegro, Dr. Styliani-Anna (Stella) Tsirka. Stony Brook University, Stony Brook, NY, USA.

We are members of INDUCER- Increasing Diversity in Undergraduate Cancer Biology Education & Research. Our program strives to give opportunities to experience cancer research to underrepresented students interested in the biomedical sciences. We want to help bridge the gap in medicine between Caucasians and People of Color and combat racial disparity. We utilize the GL261 cell line in the murine model to study and understand glioblastomas and their tumor microenvironment, which includes microglia and macrophages. Microglia function as macrophages of the central nervous system, play a critical role in the innate and adaptive responses to pathogens and can take on a pro-inflammatory/anti-tumorigenic (M1) or anti-inflammatory/pro-tumorigenic (M2) phenotype. Our research introduces Colony Stimulating Factor 1 Receptor (CSF1R), which is expressed by both microglia and macrophages, whose signaling is critical for their proliferation and survival. Pexidartinib is a CSF1R inhibitor drug developed by Plexxikon Inc (PLX), a pharmaceutical company. They have generated PLX3397 and PLX5622. Each drug inhibits specific kinases, for example, PLX3397 inhibits c-KIT, CSF1R, and FLT3, which are key players in tumor proliferation, while PLX5622 is a specific inhibitor that only targets CSF1R signaling. Both PLX3397 and PLX5622, provided to mice in their chow, ablate microglia in the CNS of wild type mice, without affecting peripheral macrophages. Upon discontinuation of the diet, microglia repopulate the CNS. PLX73086 is a second generation CSF1R inhibitor, and little is known about its effects on microglia and macrophages. What is known is that it should only ablate macrophages in the periphery, not affecting the CNS because it is not expected to cross the Blood Brain Barrier. Upon the discontinuation of the diet, repopulation is similarly expected. In our research, we studied the effects of PLX73086 on macrophages and microglia of the murine glioma model, after being fed the diet for 7 days

and 7 days off the diet. We compared the extent of ablation and repopulation of the tissue.

D066 A prospective study on chemotherapy-induced anemia using serial hemoglobin measurement in cancer patients undergoing treatment at National Hospital Abuja, Nigeria. Simeon Chinedu Aruah¹, Rasaan Oyeseun¹, Oche Ogbel¹, Sampson Ezikeanyi², Elias Aniwada³, Manjit Dosanjh⁴, Laurence Wroe⁵, Norman Coleman⁶. ¹National Hospital Abuja, Abuja, FCT Abuja, Nigeria, ²UNFPA Abuja, Abuja, FCT Abuja, Nigeria, ³Department of Community Medicine, University of Nigeria College of Medicine, Enugu, Enugu, Nigeria, ⁴CERN, Geneva, Geneva, Geneva, Switzerland, ⁵Department of physics, Denys Wilkinson Building, Oxford, UK, ⁶International Cancer Expert Corps Inc., Washington DC, USA.

Introduction: Anaemia is a common complication of myelo-suppressive chemotherapy. Severe anaemia is usually treated with red blood cell transfusion, however, mild-to-moderate anaemia are most often managed conservatively. There is no universally established benchmark for haemoglobin of patients selected for cancer chemotherapy to guide a global best practice and enhance patients treatment outcome and their quality of life. Objective: The objective of this study is to examine the change in Hb levels of cancer patients undergoing chemotherapy measuring Hb after treatment. Materials & Methods: A total of 100 voluntary patients with solid malignancies were recruited within a period of eight (8) months. Baseline demographic characteristics and type of tumours were documented. Pre-treatment Hb level was measured on the first day of consultation and repeated every 2 weeks during and after the therapy until after three consecutive Hb readings (6 weeks). Results & Analysis: All data were analysed using IBM statistical package for Social Science (SPSS) version 20. 88 of the 100 cancer patients were female. Breast 68% (68) was the commonest site of tumour. Prevalence of anaemia in the study was 72% and majority of the patients had their Hb within the range of 9.60 g/dl to 10.62 g/dl at the end of their treatment. At P-value >0.05 and standard deviation there was no statistical significance on distribution of mean haemoglobin values, were independent of sex and type of treatment. Conclusion and Recommendation: Our results show that chemotherapy has no significant effect on Hb level between 11 g/dl to 12 g/dl. Prevalence of anaemia in the cohort of patients was 72%. We recommend a benchmark minimum of Hb of 11 g/dl for all patients being selected for chemotherapy in Nigeria.

D067 The REACT study: A feasibility study to develop and test the integration of a California Cancer Registry Early Case Ascertainment process via electronic pathology reporting with an online clinical trial matching tool. [Hala T Borno](#), Christine Duffy, Sylvia Zhang, Todd Golden, Zinnia Loya, Debby Oh, Anobel Odisho, Scarlett Lin Gomez.

University of California, San Francisco, San Francisco, CA, USA.

Background: Representation of diverse patient populations in prostate cancer clinical trials is essential to ensure that trial results are applicable to all affected men. However, underrepresentation among racial/ethnic minorities remains a critical problem in cancer research. Population-based cancer registries provide a potential platform to overcome problems with inclusion of diverse patient populations in clinical research if they are used as a source for recruitment. Methods: Leveraging the statewide implementation of electronic pathology (e-path) for cancer case identification, we performed a pilot feasibility study, REACT (Registry Early case Ascertainment process via e-path with an online Clinical Trial matching tool), within the Greater Bay Area Cancer Registry to (1) develop and test a process using e-path to rapidly identify new cases of advanced prostate cancer for potential enrollment into existing prostate cancer clinical trials; and (2) test the utility of an online clinical trial matching tool used in combination with e-path to improve matching of underrepresented patients into advanced prostate cancer clinical trials. All study materials were translated into Spanish, and a Spanish-speaking bilingual recruiter is one of two recruiters. This study will accrue 50 patients. Results: Thus far, a total of 224 cases were identified from 19 reporting facilities through e-path and 213 (92%) were sent invitation letters. We have initiated recruitment contact calls with N=101; of these, 11 were excluded due to physician-indicated contraindication, and 17 (17%) declined participation. To date, 12 patients have enrolled in the study, 10 of whom completed baseline surveys, and 4 subsequently completed follow-up surveys after using the online matching tool. The majority (N=7) of participants were NH White; of higher income, >\$150,000 (N=6); and of higher education, >bachelor's/associate degree (N=8). Nine participants indicated use of the internet to learn about prostate cancer and 4 found internet prostate-cancer related information very useful. Nine participants reported receipt of prostate cancer treatment in the past 3 months, 8 received hormonal therapy, 4 received radiation, and 2 received surgery. To assess research knowledge and attitudes, 7 indicated awareness of cancer clinical trials, 6 indicated interest in participating in clinical research, 7 held a positive and 3 held a neutral attitude towards cancer clinical trials, however 5 indicated

that they would not participate in a randomized study. To assess utility of the matching tool, 2 indicated it increased their interest in participating in clinical trials. Discussion: As the study progresses, we will focus effort on recruitment of underserved patients. However, thus far, preliminary results indicate that e-path used in combination with an online clinical trial matching tool may serve as an important recruitment vehicle for prostate cancer clinical trials.

D069 Does adherence to National Comprehensive Cancer Network (NCCN) practice guidelines improve survival? [Kiran Clair](#), Sora Tanjasiri, Robert Bristow. University of California, Irvine, Irvine, CA, USA.

Introduction Significant advancements have been made over the last 50 years in the areas of cancer biology, pathology, therapeutics, and surgical planning with only modest improvements in the overall survival of patients. Disparities in survival across different racial/ethnic groups and geography are multifactorial; however, a minimum set of quality indicators would allow us to assess adherence to clinical guideline therapy as a measure of quality care and a therapeutic standard all patients should be provided. The National Comprehensive Cancer Network (NCCN) has developed clinical practice guidelines to assist providers in the treatment and surveillance of patients across many primary cancer sites. In this systematic review, we aim to evaluate available literature assessing the relationship of NCCN guideline adherent cancer care and overall survival in gastrointestinal malignancies. Methods We performed a systematic literature search through June 2019. We searched MEDLINE (Pubmed) using a combination of MESH terms, only English language literature was included. Our search query was designed to assess the inclusion of survival data in studies evaluating the receipt of NCCN guideline adherent care in gastrointestinal cancers. Study exclusion criteria included: therapeutic or surgical clinical trial, non-NCCN guideline assessment, symptom-based guidelines, evaluation of tumor board or multidisciplinary team, disease specific practice guidelines. We plan to include additional disease groups: gynecologic, genitourinary, hepatobiliary, and breast cancer in our future analysis. Results The results of our review identified 59 studies, of which 23 studies were excluded based on criteria listed above. Of the 26 studies, 7 studies included overall survival as part of the statistical analysis in relation to compliance with NCCN guidelines. Of the 7 studies, 5 of these studies showed a favorable relationship with improved overall survival associated with increased compliance with NCCN guidelines. One study did not show a difference in overall survival, and one study had mixed

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results. This observed pattern supports the hypothesis that increased adherence to NCCN guidelines is associated with improved overall survival for patients with gastrointestinal malignancies. Conclusion Despite some limitations, our review has demonstrated that increased compliance with NCCN guidelines is associated with improved overall survival. Additional research is needed to further assess the relationship between NCCN guideline adherence and overall survival across other disease types. Specific parameters of the NCCN guideline should be analyzed to assess which aspects and sequences of treatment are most critical to patient survival. This effort could help assess opportunities for intervention for patients who are most at risk for receiving non-adherent guideline-based cancer care.

D070 Examining medical providers' involvement in diabetes and hypertension clinical care management of Black breast cancer patients.

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Purpose: Hypertension and diabetes are common comorbidities present at breast cancer diagnosis, which may account for half of the Black-White breast cancer survival disparity. Having a coordinated team of medical providers to manage both breast cancer and comorbidities for patients can improve care quality and outcomes; however, these relationships are understudied. Therefore, we examined 1) type of medical provider involved in diabetes and hypertension clinical care management and 2) whether type of physician team was associated with optimal clinical care management of diabetes and hypertension during breast cancer care. Methods: We used medical and pharmacy records and interview data from the Women's Circle of Health Follow-Up Study, an ongoing population-based cohort of Black breast cancer survivors. Women with diabetes or hypertension for at least one year prior to breast cancer diagnosis (2012-2016) were included (N=274). Optimal diabetes management was categorized as physician order of HbA1c test, LDL-cholesterol test, and medical attention for nephropathy; and optimal hypertension management was categorized as physician order of lipid screen and prescription for hypertension medications within

the 12-months post cancer diagnosis. Visits with any cancer specialist, primary care provider, or medical specialist were examined and then categorized as shared care (visits with both a cancer specialist and primary care physician and/or medical specialist) or cancer specialist only. The likelihood of receiving optimal clinical care management for either diabetes and hypertension during breast cancer care was compared by type of physician team using multivariable binomial regression, adjusting for age and health insurance at diagnosis, cancer stage, and comorbidity type and disease severity. Results: 86% of patients had a primary care visit in the 12-months after diagnosis. Most clinical care for comorbidities were managed by primary care providers (diabetes tests: 65% HbA1c, 88% LDL- cholesterol, 60% microalbuminuria; hypertension: 88% lipid screen, 85% hypertension medications). Half of all measures were ordered within 6 months of diagnosis. Only half (49%) of patients received optimal comorbid clinical care management and 90% received shared care. Patients with shared care were four times more likely to have optimal clinical care management for diabetes and hypertension compared with patients who only saw cancer specialists (aRR: 4.41; 95% CI: 1.57, 12.34). Conclusions: These findings are important in that shared care may promote optimal clinical care management for diabetes and hypertension and lead to reduced mortality and improved outcomes, particularly for racial/ethnic minority patients with a greater burden of chronic conditions. Future research is needed to explore the processes of shared care to determine whether medical providers are performing clinical care independently or if providers are communicating to coordinate patients' care.

D071 Impact of racial differences in financial burden on time to treatment.

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Hill, NC, US, ⁷Department of Health Policy and Management, Gillings School of Public Health, UNC-Chapel Hill, Lineberger Comprehensive Cancer Center, UNC-Chapel Hill, Chapel Hill, NC, US.

Background Racial disparities in time-to-treatment exist among cancer patients, with patients of color being more likely to experience treatment delays. Such racial differences in treatment initiation are likely on the causal pathway to inequities in treatment outcomes. Emerging research has documented racial differences in financial burden, but little is known about the contribution of financial burden to disparities in treatment delays. In this study, we evaluated whether financial burden partly accounted for racial disparities in time to treatment initiation among a cohort of cancer survivors. Methods We used cross-sectional data of patients enrolled in the University of North Carolina Health Registry/Cancer Survivorship Cohort (HR/CSC) between 2010 and 2016. The sample for this study was limited to cancer patients and survivors who identified as non-Hispanic White or Black, received a diagnosis for breast, genitourinary, gastrointestinal, or head or neck cancer, and completed a questionnaire at least 30 days following their diagnosis (N=2,123). Time to treatment was measured in number of days from diagnosis to start of first course of treatment, ascertained from the medical record. Initial treatment was either surgery, chemotherapy, radiation, or hormonal therapy, depending on the clinical indication. Financial burden was assessed using the Patient Satisfaction Questionnaire-18 on the self-reported satisfaction with the financial aspects of care (>3.5 is satisfied; ≤3.5 is unsatisfied). To assess racial differences in time to treatment, we conducted both unadjusted and adjusted OLS regression analysis. Results In the first model predicting time to treatment as a function of race and clinical factors only, Black race was associated with a 11.4 day increase in the number of days between diagnosis and treatment ($p < 0.001$). In a second model adjusting for race, clinical factors and financial burden, the absence of financial burden was associated with a decrease in the number of days between diagnosis and treatment ($\beta = -3.2, p = 0.042$). Results were similar in the final fully adjusted model accounting for the above covariates in addition to sociodemographic factors, with the absence of financial burden being associated with a minor decrease in the time to treatment initiation ($\beta = -3.0, p = 0.044$). There was only a minor attenuation in the Black-White disparity in the fully adjusted model, with Black race being associated with an increase of 10.6 days between diagnosis and treatment initiation ($p = 0.001$). Conclusions In Black patients and patients who report experiencing financial burden a greater number of days elapse between diagnosis and treatment

initiation. Decreases in the time from diagnosis to first treatment is a modifiable factor in treatment inequities whether both for related to financial burden and race.

D072 Challenges providing gynecologic cancer care for women in Puerto Rico after the impact of Hurricanes Irma and Maria: Findings from key informant interviews. Sandra I. García-Camacho¹, Mirza Rivera², William Calo³, Pablo Mendez², Guillermo Tortolero-Luna¹, Yanina Bernhardt-Utz¹, Astrid Diaz-Quñones⁴, Vanessa Patricia Gomez-Vargas⁴, Sharee Umpierre-Catinchi⁵, Istoni DaLuz-Santana², Ana Ortiz⁴. ¹Cancer Control and Population Sciences Division, University of Puerto Rico Comprehensive Cancer Center, San Juan, PR, USA, ²Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR, USA, ³Pennsylvania State University Hershey College of Medicine, Hershey, PA, USA, ⁴Cancer Control and Population Sciences Division, University of Puerto Rico Comprehensive Cancer Center; Graduate School of Public Health, University of Puerto Rico Medical Sciences Campus, San Juan, PR, USA, ⁵School of Medicine, University of Puerto Rico Medical Sciences Campus, San Juan, PR, USA.

Introduction: Cancer patients are among the most vulnerable populations in the aftermath of natural disasters. Proper delivery and continuity of cancer care is a top priority of medical management after a disaster. On September 2017, Hurricanes Irma and María impacted Puerto Rico (PR), causing major disruption in essential services. Using key informant (KI) interviews, this study documents the experiences and responses of providers/organizations involved in the delivery of gynecologic oncology care in PR. Methods: We conducted 23 KI interviews from organizations in different parts of the island. KIs included providers (gynecologist oncologists, hematologist oncologists, surgeons, radiologists, oncologists, obstetrics and gynecologists), nonprofit organizations (vice-presidents and personnel of the American Cancer Society [ACS] of PR), cancer care facilities (vice-presidents and personnel of public and private hospitals and clinics), and government agencies (Auxiliary Secretary of the PR Department of Health and Government personnel). The interviews addressed problems encountered in their clinics/organizations in the aftermath of the hurricanes, perceived stressors and risks of patients, and recommendations for future preparedness efforts. Results: All clinics/organizations took some preparedness measures but did not have an updated emergency protocol to follow. Most of the physicians prepared by protecting the clinics and calling patients to reschedule surgeries and follow-up visits. All KIs experienced in their clinics/organizations disruption

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of telecommunications; potable water, and electric power after the hurricanes. They confronted challenges in finding essential supplies like fuel for electricity generators, oxygen, and chemotherapy drugs. The oncologists implemented an emergency collaboration network to share services, medical supplies, and other essential medications needed for the care of patients. Some of them expressed that treatments, such as radiotherapy, were delayed because the equipment required a stable source of energy and cooling temperatures. Organizations such as the ACS helped move patients to the United States so that they did not have to interrupt their cancer treatment; many of these patients had to come back as they were not able to get services there. Even the largest hospitals in PR, including those in the most populous cities, confronted serious problems of communication with the government and FEMA. Conclusion: Although interruptions and delays in services occurred, all the KIs interviewed mentioned to have given the best effort to try to prevent patients from interrupting their treatment. One of the biggest obstacles to provide oncology treatment was the lack of effective communication between agencies. These results guided the topic areas that will be assessed in the subsequent quantitative phase of this NCI sponsored project, and the development of a disaster management plan for cancer patients in PR. NCI Grant #R21CA239457.

D073 Combination of insulin-like growth factor-1 receptor/insulin receptor (IGF1R/IR) and androgen receptor (AR) antagonists with metformins inhibits triple-negative breast cancer (TNBC) progression in vitro and in vivo. Nalo M. Hamilton, PhD, APRN-BC¹, Diana C. Márquez-Garbán, MD*², Michael E. Jung, PhD³, Jaydutt Vadgama⁴, Richard J. Pietras, MD, PhD². ¹UCLA School of Nursing, Los Angeles, California, USA, ²UCLA David Geffen School of Medicine, Los Angeles, California, USA, ³UCLA Department of Chemistry and Biochemistry, Los Angeles, California, USA, ⁴Charles Drew University School of Medicine and Science, Los Angeles, CA, USA.

Triple-negative breast cancer (TNBC) affects only about 15% of women with breast cancer (BC) but accounts for almost 50% of all BC deaths. At this time, development of targeted treatments for TNBC is urgently needed. Insulin-like growth factors and diabetes mellitus type 2 are noted to be associated with increased incidence of estrogen receptor-negative BCs such as TNBC particularly among African American patients. Since receptors for insulin-like growth factor-1 receptor/insulin receptor (IGF1R/IR) and androgen receptor (AR) are known to be enriched and to cross-communicate in subtypes of TNBC (Hamilton N

et al., *Int J Mol Sci* 2017;18:2305 [PMCID: PMC5713274]; Hamilton N et al., *Biomed Res Int.* 2015;2015:925703 [PMCID: PMC4385615]), we first assessed effects of these receptor antagonists on proliferation of human and murine TNBC cells in vitro. Combination treatment with BMS-754807 and/or NVP-AEW541 (IGF1R/IR inhibitors) plus enzalutamide (AR inhibitor) effectively reduced proliferation of human MDA-MB-231, BT549, HCC1937 and murine 4T1 TNBC cells in vitro ($P < 0.001$). Moreover, metformin and analogues of metformin that inhibit TNBC progression in part by interactions with AMPK and with IGF1R/IR pathways elicited further suppression of TNBC cell proliferation when combined with the IGF1R/IR-AR antagonists ($P < 0.001$). Importantly, the combination treatments also reduced the migration in vitro of human and murine TNBC cells to a greater extent than any single agent given alone. Calculations to determine the coefficient of drug interaction (CDI) revealed therapeutic synergy in drug combinations predominantly in those containing BMS-754807. Of note, combination treatments containing BMS-754807 were found to significantly stimulate excess reactive oxygen species (ROS) in vitro, a process that may promote tumor cell apoptosis. In ongoing experiments, novel metformin analogues are also found to inhibit human MDA-MB-231 xenograft progression in vivo ($P < 0.001$). Our findings suggest that combination treatments containing IGF1R/IR and AR antagonists alone and combined with metformins suppress TNBC progression, with potential to impact patient outcome in the future. [Funding by NCI U54 CA1433930; California Breast Cancer Research Program] *Authors contributed equally.

D074 Variations in genomic testing across cancer sites and by demographic characteristics. Siran Koroukian, Weichuan Dong, Johnie Rose, Fredrick Schumacher, Sarah Markt. Case Western Reserve University, Cleveland, OH, USA.

Study Objective: Genomic testing is essential to identify the best treatment modalities for certain cancers; yet, its uptake has been relatively low, especially among disadvantaged subgroups of the population. The aim of this study is to identify demographic and clinical factors associated with receipt of genomic testing in Ohioans diagnosed with either incident female breast, kidney, bladder, prostate, colorectal, or lung cancer. Methods: We used data from the 2009 linked Ohio Cancer Incidence Surveillance System and Medicare files, and identified genomic testing using the appropriate procedure codes in claims data. Our study population included 10,945 patients. Independent variables examined were age at diagnosis (< 65 , 65-74, 75+), sex, race (White or All Other), dual enrollment in the

Medicare and Medicaid program (or 'dual') as a marker for low income and heightened vulnerability, and advanced stage at diagnosis (Regional/Distant versus Local stage). We conducted multivariable logistic regression analysis to identify correlates of genomic testing by cancer site. Results: For all cancer sites combined, 11.1% were younger than 65, and 40.6% were older than 75 years of age. Eighty eight percent were White, 47.0% were women, 13.9% were duals, and one third were diagnosed with advanced-stage cancer. Overall, only 19.5% underwent genomic testing, ranging from a low of 6.7% in prostate cancer patients, to a high of 39.3% in breast cancer patients. In addition, we observed considerable variation in genomic testing by age, race, sex, dual status, and cancer stage across cancer sites. Adjusting for the independent variables listed above, being 75 years of age or older was significantly and positively associated with increased likelihood of undergoing genomic testing in breast (adjusted odds ratio: 1.17, 95% confidence interval: 1.04, 1.32), kidney and bladder combined (1.29 (1.09, 1.53)), and prostate cancer patients (1.45 (1.12, 1.89)). Advanced-stage disease was associated with increased likelihood of genomic testing in breast and colorectal cancer patients (1.40 (1.17, 1.67) and 3.07 (2.30, 4.11), respectively), but with decreased likelihood in kidney and bladder cancer patients (0.66 (0.48, 0.91)). Finally, we note that White patients with lung cancer were significantly more likely than others to undergo genomic testing (2.49 (1.29, 4.78)). Conclusion: Our data from 2009 provide baseline statistics on genomic testing uptake in Ohio. Data for subsequent years will help us to assess trends in providing personalized medicine.

D075 Investigating the immuno-biology underlying differential response to immunotherapy in White and non-White patients with metastatic acral melanoma. [Kaysia](#)

[Ludford](#), Chantal Saberian, Sara K Nabhan, Stephen Gruschkus, Chantale Bernatchez, Natalie Jackson, Cara L Haymaker, Patrick Hwu, Adi Diab. The University of Texas MD Anderson Cancer Center, Houston, TX, USA.

Background: Acral melanoma (ACML), the rarest form of melanoma (MEL) represents 4-6% of all MEL cases however it is the most common subtype darker pigmented individuals accounting for up to 70% of all cases. Checkpoint inhibitors (CPI) have emerged as an efficacious treatment option. In cutaneous melanoma (CtMEL), tumor mutational burden (TMB) correlates with response rate. Despite low TMB in AMEL, responses to CPI parallel those in CtMEL. Given the differences in ethnicity among ACML patients compared CtMEL patients we aimed to study: (i) the correlation between response and TMB, (ii) the relationship between

ethnicity and response and (iii) the underlying immune-biology accounting for differential responses. Method: All advanced and metastatic ACML patients (pts) treated with anti-CTLA4 (ipilimumab) or anti-PD1 (pembrolizumab or nivolumab) immunotherapy between March 2011 and January 2019 at MD Anderson Cancer Center, Texas, were included in this retrospective analysis. Clinical response, progression free survival and overall survival (PFS and OS) and their correlation to ethnicity and TMB were evaluated. Objective response was measured using RECIST 1.1 and analyzed using logistic regression. PFS and OS were assessed using the Kaplan Meir method and log-rank test. TMB was predicted using validated algorithm based on a defined gene mutation set obtained using next generation sequencing. Results: 44 pts with Stages III-IV ACML (IIIA: 2%, IIIB 9%, IIIC 27%, IV-M1A: 16%, IV-M1B: 25%, IV-M1C: 20%, IV-M1D2%) were included in the analysis. Median age was 63 years old (39-88) and 60% were men. Of 44 patients 12 (27%) self-identified as Hispanic, 2 as (5%) Asian and 30 (68%) as White. The overall response rate was nearly 5 times higher in Hispanic compared to White pts (OR 4.60, p-value 0.04). The median TMB in Hispanic patients was 16 mutations/mb compared to 7 mutations/mb in White pts. The median PFS and OS for White pts were 7.2 months and 34.3 months respectively while for Hispanic pts the median PFS and OS were 6.7 (log-rank p=0.69) and 26.1 months (log-rank p=0.38) respectively. In addition to this data deep immune analysis of tumor tissue including nanostring, gene expression and TCR sequencing will be assessed and reported. Conclusions: The data from this small retrospective study suggests that White pts with ACML had low response rates to CPI presumably due to low TMB while interestingly, Hispanic pts, despite relatively low TMB have high response rates paralleling those seen in the overall CtMEL population. Despite higher response rates in Hispanic patients, there was no significant difference in OS. This data together with further immune analysis provides the rationale to design prospective studies to investigate how tumor micro-environment varies with ethnicity. Additionally we will investigate the social and biological determinants that limit survival in Hispanic pts despite higher response rates.

D076 Florida-California Cancer Health Disparity Research, Education & Engagement (CaRE2) Center: Research education overview and preliminary results. [Bereket](#)

[Mochona](#)¹, Debra Lyon², Ite A. Offringa³, Kinfe K. Redda¹, Renee R. Reams¹, Folakemi Odedina², Diana J. Wilkie², John D. Carpten³, Mariana C. Stern³. ¹Florida A&M University, Tallahassee, FL, USA, ²University of Florida, Gainesville, FL, USA, ³University of Southern California, Los Angeles, CA, USA.

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Introduction: Florida Agricultural & Mechanical University (FAMU), University of Florida (UF) and University of Southern California (USC) have partnered to build a strong pathway to workforce diversity in Florida and California. Combined, the three institutions have unique expertise to support research education for Black and Latino students. FAMU (a minority serving institution) has a demonstrated track record of enrolling Under-Represented Minority (URM) students and preparing them as outstanding graduates who go on to pursue PhD degrees in biomedical and behavioral sciences. Hence, FAMU provides a unique environment for the development and testing of this triad partnership program. UF is a top world leader in interdisciplinary research and is one of only a few institutions with an academic health center having six health-related colleges. The UF's multidisciplinary centers and institutes are designed to create synergies and collaborative research opportunities that focus on the translational nature of biomedical research, following the continuum from fundamental research to clinical research to patient care. USC, located in the multicultural city of Los Angeles, has a highly diverse student body, with 20% of the student population comprised of Black and Hispanic/Latino students. The USC Norris Comprehensive Cancer Center (NCCC) is a major regional and national resource for cancer research, treatment, prevention, and education. Collectively, the three institutions investigate the complex origins and progression of cancer, develop prevention strategies, and search for cures. Methodology and Results: Preliminary results from the first year, which included multiple URM trainees: (thirteen undergraduate, one postbaccalaureate, eight graduate, seven postdoctoral fellows and twelve early-stage investigators), suggested that participation in CaRE2 program is a positive professional development experience, leading to acquisition of research skills in interdisciplinary cancer research, knowledge about cancer health disparities, building of personal and professional networks, and exposure to career opportunities in cancer through interaction with peers, mentors and NCI personnel. Conclusion: The CaRE2 Program appears to enhance the trainees' motivation for a career in cancer research and may lead to the development of a more diverse workforce to address cancer health disparities. The CaRE2 program is funded by the National Cancer Institute (NCI) of the National Institutes of Health (NIH) through the grant of NIH/NCI1U54CA233396, 1U54CA233344 and 1U54CA233346.

D077 Sociodemographic and geographic disparities in treatment for early-stage non-small cell lung cancer (NSCLC) patients in California.

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Background: Lung cancer is the second most commonly diagnosed cancer and the leading cause of cancer-related death in the U.S. In 2013, the U.S. Preventive Services Task Force began recommending lung cancer screening, which has resulted in earlier stage diagnosis for many tobacco users. The National Comprehensive Cancer Network (NCCN) provides evidence-based cancer treatment recommendations. Evidence suggests that a patient's receipt of guideline-concordant treatment (GCT) increases survival, especially for screen-detected, earlier stage cancers. The objective of this study is to describe receipt of timely GCT in California NSCLC patients by sociodemographic characteristics and geography. Methods: We studied 23,080 patients diagnosed with stage I/II NSCLC (2006-2015) in the California Cancer Registry. We classified treatment received as: undertreated, GCT, or over-treated according to NCCN guidelines, and timeliness (treatment began \leq 45 days after diagnosis) among patients who received GCT. We describe the population according to treatment received, and timeliness by detailed race/ethnicity, stage of diagnosis, sex, age, insurance type, marital status, cancer approved program, and neighborhood socioeconomic status. We calculated absolute and relative inequalities in GCT and timeliness between race/ethnic groups. Hotspot analyses were conducted to identify regions at increased risk for under-treatment/overtreatment, and treatment delay by patient residential census tract. Results: Overall, 69.95% of patients received GCT, 14.53% were undertreated and 15.55% over-treated. Among patients who received GCT, 56.78% began treatment within 45 days of diagnosis. Under-treatment and treatment delay were more frequent in patients who were black or Hispanic, had public insurance, and were of lower socioeconomic status. We detected moderate absolute inequalities in receipt of GCT and timely care; no relative inequalities were observed. Cold and hot spots for under- and over-treatment and timeliness were identified within Metropolitan areas across California. Conclusion: Under-treatment and delayed treatment for early stage lung cancer disproportionately affect priority populations. With rising numbers of early stage lung cancers due to screening smokers, administration of timely proper treatment of lung cancer is critical.

D078 Unlocking the vault: Can 2nd opinions by Comprehensive Cancer Center breast oncologists improve treatment quality for African Americans? [Rena J Pasick¹](#),

Brittany Campbell¹, Hope S Rugo¹, Christen Dillard¹, Marion Harris², Galen Joseph¹. ¹UCSF, San Francisco, CA, US, ²Advocate, San Francisco, CA, USA.

Research increasingly points to inadequate treatment as a factor in the excess breast cancer mortality experienced by African Americans. Likely causes include lack of guideline-concordant care, underuse of medical advances, and limited opportunities to participate in clinical trials and genetic counseling. African Americans are disproportionately affected because they are more likely to receive care in low-resource settings. Importantly, emerging research shows that NCI-designated Comprehensive Cancer Centers (CCCs) have the best cancer outcomes compared with other clinical settings - yet African Americans and Latinx are under-represented as patients in CCCs. It is as if the leading cancer clinicians and the resources at their disposal are locked in a vault inaccessible to those with the greatest need. We used ethnographic methods to explore the feasibility of and extent to which the simple mechanism of a CCC 2nd opinion can improve the quality of treatment offered to African American breast cancer patients receiving care in a range of other institutions. Through community outreach, 14 patients were recruited and 17 CCC consultations were conducted at no charge. Each visit was observed and audio-taped to capture the consulting oncologist's recommendations. Patients were interviewed 3 weeks after the consultation and again up to 1 year later to document the impact of the consultation on their treatment. Consulting oncologists were also interviewed. Our findings reveal a variety of ways in which the CCC 2nd opinion substantially improved the quality of treatment for African American breast cancer patients. In all cases CCC clinicians offered important recommendations, from complete revision of a treatment plan to adding/changing medications, modifying the plan for monitoring, and/or improving management of side effects. Patients reported that all major recommendations were implemented by their treating clinicians. In one dramatic case, chemotherapy was failing to slow the growth a young public hospital patient's stage 3 tumor associated with a P53 mutation. The CCC clinician recommended and advocated for an entirely different treatment. In remission two years later, the patient has had another child. To our knowledge, this is the first study to explore the CCC consultation as an intervention to reduce mortality disparities. It appears highly feasible to target CCC 2nd opinions to vulnerable patients at relatively low cost to the CCC. Many CCC clinicians are eager to see high-risk under-represented patients, and go beyond the

consultation by communicating with treating clinicians and seeing patients more than once. Patients readily recognized the expertise of CCC clinicians and were deeply grateful for the opportunity. Based on this pilot study, the 2nd opinion concept warrants further testing via a randomized trial. Comprehensive Cancer Centers can and must take greater responsibility for disparities in their region through innovations that extend their expertise beyond their walls.

D079 Oncologists' approach in managing pre-existing chronic comorbidities during patients' active cancer treatment. [Dudith Pierre-Victor¹](#), Iman K. Martin², Brenda Adjei³, Mary Shaw-Ridley⁴, Bruce Rapkin⁵, Marjorie Good¹,

Diane ST. Germain¹, Bernard Parker¹, Wortia McCaskill-Stevens¹. ¹Division of Cancer Prevention, National Cancer Institute, NIH, Bethesda, MD, USA, ²Division of Blood Diseases and Resources, National Heart, Lung, and Blood Institute, NIH, Bethesda, MD, USA, ³Division of Cancer Control and Population Sciences, National Cancer Institute, NIH, Bethesda, MD, USA, ⁴School of Public Health, Jackson State University, Jackson, MS, USA, ⁵Department of Epidemiology & Population Health, Albert Einstein College of Medicine, New York, NY, USA.

Background Cancer frequently occurs with other chronic diseases, and this poses serious care coordination challenges during patients' active cancer treatment (ACT) and contributes to disparities in health outcomes. There is limited research addressing pre-existing chronic comorbidity (PCC) management during ACT. This study aimed to examine oncologists' approach for PCC management during ACT. Methods Oncologists in the National Cancer Institute's Community Oncology Research Program (NCORP) were surveyed about their approach in managing PCC. The Likert scale survey was piloted-tested, IRB-approved, and administered to oncologists. In December 2018, NCORP network oncologists were sent an email invitation to complete the online survey. Pearson chi-square test was used to identify differences in oncologists' management approach of PCC. Results Among the 375 respondents of the ongoing survey, 45.6% practiced primarily as medical oncologists, 37.3% as hematology, surgical, or radiation oncologists, and 17.1% as other oncology specialists. Approximately 70% of oncologists reported that >50% of their patients had ≥ 1 PCC. When asked about the three most challenging PCC to manage, 23.3% cited diabetes, 19.5% cited heart disease, and 57.1% cited another PCC. Medical oncologists were more likely to cite diabetes first (77.5%) and less likely (22.5%) to cite heart disease first compared to other specialists ($p=0.004$). Co-management with patients' PCP

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was the most common management approach for diabetes among medical oncologists (42.2%) compared to those of other specialties (15.0%) while referral to other physicians was the most common approach among those of other specialties (50.0%) compared to medical oncologists (22.5%) ($p=0.002$). Consultation and referral were the most common management approaches for heart disease across oncology specialties. Conclusion Oncologists face significant challenges to manage patients' PCC during ACT. These results indicate that the medical oncologist is more likely to co-manage diabetes with patients' PCP compared to other oncology specialists, but heart disease was seldom co-managed. Greater collaboration between oncology and non-oncology specialists is needed for effective management of PCC during ACT to ensure complete and coordinated care and to reduce disparities in health outcomes for these patients.

D080 Securing the cancer continuum of care model for racially and ethnically diverse and medically underserved populations.

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Disparities in access to cancer care and treatment outcomes among racial, ethnic and underserved populations have been observed for decades. Despite a plethora of national

and local initiatives aimed at addressing these disparities, progress to date has been limited. Guided by the domains of the cancer care continuum (CCC) established by the IOM/ NASEM [1] the Diverse Cancer Communities Working Group [2] (CWG) will deliver a framework with domains, processes and activities which when disseminated and implemented in the US, will contribute in an impactful way to addressing cancer care disparities. To achieve our goal, we utilized methodology similar to that used to identify best practices in recruiting diverse patients into cancer clinical trials.[3] We conducted an environmental scan to identify strategies and associated experts who successfully provided community and/or patient-centric, IOM defined domain standards in our population of interest. The environmental scan was conducted between March and September 2018, resulting in the identification of 84 unique experts and 44 unique patient organizations. The identified experts had documented processes and best practices along the six CCC domains as follows: Prevention & Risk Reduction (29%); Screening (30%); Diagnosis (11%); Treatment (8%); Survivorship (18%); and End-of-Life (5%). Of the 84 participants, 26% are experts in all six domains, 36% are experts in multiple domains, and 14% are also experts in Patient Navigator Research Programs. Drawing from our environmental scan, the CWG engaged the experts and advocates to develop the foundation for a theoretical underpinning of an evidence-based, practical continuum of care framework. Highest cross-cancer-continuum areas of impact included 1) patient navigation which addresses barriers to enable patients to progress successfully along the cancer continuum of care, 2) excellence in community engagement, a necessary mandate to build trust in among minority and underserved populations, and 3) implementation of health care system changes based on real-world examples. Additionally, experts focused on opportunities to close gaps between the CCC domains with specific emphasis on screening, diagnosis, treatment, and survivorship, with the understanding that health care system change is often effectively sustained by long-term policy implementation that ultimately increases access, utilization and standardization across the continuum. This adapted framework is intended to guide researchers, health care leaders and policy leaders to promote health equity in cancer outcomes. References: [1] Institute of Medicine 2013. Delivering High-Quality Cancer Care; Charting a New Course for a System in Crisis. Washington, DC: The National Academies Press. <https://doi.org/10.17226/18359>; [2] URL: <http://shcllc.info/cancer-working-group/> [3] URL: <http://ascopubs.org/doi/full/10.1200/JOP.18.00638>

D081 Geographic relationship between lung cancer clinical trial sites and patient prevalence and demographics in the Medicare Fee-for-service program.

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Racial and ethnic minority groups have low rates of inclusion in cancer clinical trials (CCTs). For example, African American patients comprise 5% of patients enrolled in CCTs that support US Food and Drug Administration approval of new drugs but represent 13.3% of the general US population. Though cancer is the leading cause of death for Asian Americans, only 3% of CCTs is composed of Asian American participants. With the promise and rise of precision medicine, it is critical that study populations in clinical research reflect the changing US demographics. Expanding access to health data and analytics empower stakeholders to better understand and advocate for equitable research and treatment access in cancer. Research question: To what extent does the current US CCT site placement for non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC) reflect the reality of lung cancer patient prevalence and demographics in the US? Methods: Researchers used the following two primary data sources: (1) Medicare Fee-for-Service (FFS) patient-level claims data from 2016, including the following data elements: prevalence, co-morbidities, hospital encounters, and costs for patients with ICD-10 codes for NSCLC and SCLC, by demographic (age, gender, race, and ethnicity). Locations were designated as high (greater than 0.87%) or low (less than 0.87%) prevalence, based on national average prevalence. (2) CCT placement data was sourced from 2018 ClinicalTrials.gov to determine ongoing NSCLC and SCLC studies where there are US study sites. Data were mapped on the Lung Cancer Index™, a National Minority Quality Forum (NMQF) geographic information system (GIS) with an interactive data warehouse and data visualization system, including geomapping. Preliminary data conclusions: 1) Of the 2812 interventional CCTs, the study team mapped 495 therapeutic, interventional, currently enrolling CCTs (after excluding trials for behavioral interventions and palliative care). 2) Of the 10015 zip codes mapped, 58.8% of those were designated as zones of high prevalence (HP) of lung cancer. Of the 5888 HP zip codes, only 10.5% had NSCLC trials and 5.6% percent had SCLC trials. 3) When analyzed by counties, of the 59% of counties with high prevalence of African American patients, only 3% and 1% of counties had more than 10 NSCLC trials and 10 SCLC trials respectively. Similarly, of the 24% of counties with high prevalence of Asian American

lung cancer patients, only 3% and 1% of counties had more than 10 NSCLC and 10 SCLC trials respectively. Implications: While additional analyses are ongoing, preliminary findings suggest that there is a major disconnect between US lung CCT placement and where patients live. The advent of precision medicine creates urgency to improve CCT enrollment of racial and ethnic minority groups, for equitable benefit of resulting innovation and access to optimal treatment. Lung cancer prevalence, including by population demographics, at the zip code and county level can be a critical guide to CCT site placement.

D083 Care burden of informal caregivers of African American cancer survivors.

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For many cancers, African Americans are diagnosed at a later stage and have poorer cancer outcomes than whites. Based on few studies, informal caregivers for African Americans are nearly all female, less than 65 years old, and provide assistance mostly with Instrumental Activities of Daily Living (IADLs). We surveyed a larger number of caregivers than previous studies about their objective and subjective care burden. Informal caregivers were recruited by nomination from participants in the Detroit Research on Cancer Survivors study, a population-based cohort study of African Americans residing in metropolitan Detroit diagnosed with a primary invasive cancer of the breast, colon/rectum, lung or prostate since January 1, 2013. Caregivers completed a baseline survey after being nominated and consenting to participate, and are invited to complete annual follow-up surveys. The survey included items on demographics, assistance with activities of daily living (ADLs), assistance with IADLs, and subjective caregiver burden (using a validated Care Burden Scale). Baseline characteristics of the first 350 informal caregiver/survivor dyads are reported here. Approximately 82% of nominated caregivers chose to participate. Most (n=145) cared for a breast cancer survivor, followed by prostate (122), colorectal (42) and lung (40). Approximately one third of cancer survivors were diagnosed with Stage I disease, another third with Stage II, and another third with advanced disease. The average age at diagnosis was 57.9 years.

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Most caregivers (77.7%) were female, African American or multiracial (>90%), completed education beyond high school (65.1%), were related to the survivor (90.0%), lived in same household or within 20 minutes (85.7%), and had at least one comorbidity (85.4%); 29.1% had four or more comorbidities. The average caregiver age was 52.5 years. About half (56.6%) were employed either full or part-time at the time of the survivor's diagnosis. Caregivers spent between 6-9 hours/day, 5-6 days/week, on average, in care. Additionally, they spent about 8 hours per week driving and/or accompanying the patient to appointments. The most common ADL needs (~60%) provided by caregivers were transferring, climbing stairs and dressing. Most (70-90%) survivors received assistance with the specific IADLs of housework, laundry, shopping, cooking, and driving. The reported burden was "little to none" for most caregivers (78.7%), with those no longer providing care at the time of survey more likely to recall the least burden. Similar to other reports of cancer caregivers, the 350 caregivers for African American cancer survivors in this study were overwhelmingly female, related to the survivor and lived in close proximity. Our future research will focus on why most caregivers reported their caregiving burden as minimal despite the number of hours and amount of assistance provided. Additionally, changes in the caregiving experience will be studied as dyads are followed over time.

D084 Overall survival (OS) of African-American (AA) and Caucasian (CAU) men who received sipuleucel-T for metastatic castration-resistant prostate cancer (mCRPC)—final PROCEED analysis. *Oliver Sartor*¹, Andrew J Armstrong², Chiledum Ahaghotu³, David G McLeod⁴, Matthew R Cooperberg⁵, David F Penson⁶, Philip W Kantoff⁷, Nicholas J Vogelzang⁸, Arif Hussain⁹, Christopher. M Pieczonka¹⁰, Neal D Shore¹¹, David I Quinn¹², Elisabeth I Heath¹³, Ronald F Tutrone¹⁴, Paul F Schellhammer¹⁵, Matthew Harmon¹⁶, Nancy N Chang¹⁷, Stephen J Freedland¹⁸, Celestia S Higano¹⁹. ¹Tulane Medical School, New Orleans, LA, USA, ²Duke Prostate and Urologic Cancer Center, Duke Cancer Institute, Durham, NC, USA, ³Medstar Southern Maryland Hospital Center, Clinton, MD, USA, ⁴Center for Prostate Disease Research at the Uniformed Services University of Health Sciences, and the Walter Reed National Military Medical Center, Bethesda, MD, USA, ⁵Departments of Urology and Epidemiology & Biostatistics, University of California San Francisco, San Francisco, CA, USA, ⁶Vanderbilt University Medical Center, Nashville, VA, USA, ⁷Memorial Sloan Kettering Cancer Center, New York, NY, USA, ⁸Comprehensive Cancer Centers of Nevada, Las Vegas, NV, USA, ⁹University of Maryland School of Medicine, Baltimore, MD, USA, ¹⁰Associated Medical

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BACKGROUND: Prostate cancer risk and mortality are higher in AAs versus CAUs. Post-hoc analyses of pooled Phase 3 data (n = 737) suggested substantial OS benefit for AA men receiving sipuleucel-T (n=33) vs placebo (n = 10) (McLeod 2012). Compared with pooled placebo patients (n = 249), number needed to treat for OS benefit at 3 years was 3 for AAs and 8 for all sipuleucel-T-treated patients (n = 488) (Moses 2017). Herein we analyzed PROCEED (NCT01306890), a large real-world registry, in which all patients received sipuleucel-T. Previously presented at ASCO Annual Meeting 2019 (Sartor 2019). **METHODS:** In PROCEED, 1902 mCRPC patients received 1 or more sipuleucel-T infusions. OS of all AA (n=221) and CAU (n=1649) men were compared. Baseline prostate-specific antigen (PSA), the most important prognostic variable for OS after sipuleucel-T (Schellhammer 2013), substantially differed by race. Thus, OS for a PSA-matched cohort (n=219 AA; n=438 CAU) was compared and univariable/multivariable analyses were performed. Post-sipuleucel-T use of OS-prolonging anticancer interventions was also assessed. **RESULTS:** After a median follow-up of 46.6 mo, median OS was 35.2 (all sipuleucel-T-treated AAs) and 29.9 mo (all sipuleucel-T-treated CAUs): HR 0.81, 95% CI 0.68-0.97; P=0.03. In the PSA-matched cohort, median OS was 35.3 and 25.8 mo, respectively (HR 0.70, 95% CI 0.57-0.86; p<0.001). Sipuleucel-T-treated AAs with lower baseline PSA had markedly longer median OS vs sipuleucel-T-treated CAUs. Among those with PSA less than or equal to median baseline PSA (29.48 ng/ml), median OS was 54.3 mo (AA) vs. 33.4 (CAUs); HR 0.52, 95% CI 0.37-0.72; p<0.001. Along with other known prognostic factors, AA race was independently associated with prolonged OS on detailed multivariable analyses (HR 0.60, 95% CI 0.48-0.74; p<0.001) and confirmed on sensitivity analyses. Post-sipuleucel-T life-prolonging anti-cancer therapies were balanced between groups. **CONCLUSIONS:** Sipuleucel-T-treated AAs had significantly

improved OS vs sipuleucel-T-treated CAUs. This analysis marks the largest known racial difference in OS in response to any therapy for mCRPC, a finding with implications for both prostate cancer pathophysiology and cancer immunotherapy. REFERENCES: Sartor 2012 (DOI: 10.1200/JCO.2019.37.15_suppl.5035); McLeod 2012 (DOI: 10.1016/j.juro.2012.02.1051); Moses KA et al 2017 (DOI: 10.1016/j.urology.2016.07.045); Schellhammer 2013 (DOI: 10.1016/j.urology.2013.01.061)

D085 Differences in the use of proton beam therapy among patients diagnosed with American Society for Radiation Oncology Group 1 proton beam therapy indication cancer types in the United States. [Helmneh M. Sineshaw¹](#), K.

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Purpose: To examine the extent of racial/ethnic and geographic differences in the use of proton beam therapy (PBT) among newly diagnosed cancer patients in the United States. Methods: We included all patients diagnosed from 2009 to 2016 with invasive single or first primary cancer categorized as Group 1 indication (recommended) for PBT by the American Society for Radiation Oncology. We conducted descriptive and multivariable multinomial logistic regression analyses to assess patient and facility characteristics associated with receipt of PBT. Results: Of the total 246,932 patients diagnosed with Group 1 indication cancer types, 0.6% received PBT. PBT use was lower in non-Hispanic (NH) blacks compared with NH whites (0.3% vs 0.6%). Patients who were older, uninsured, with low median income, higher comorbidity score, treated at low volume or community programs or at facilities located in the south, and residing in rural areas had the lowest PBT use. There was a 46% relative difference in PBT use between NH blacks and NH whites, with marked variation by geographic region of facility. NH black had 37% lower odds of receiving PBT compared with NH whites (odds ratio, 0.63; 95% confidence interval, 0.50-0.79), which became nonsignificant after accounting for difference in cancer type. Further, minority race/ethnicity, older age, high comorbidity score, uninsurance/non-private insurance, treatment out of NCI-designated center, and treatment out of facilities in the northeast region were significantly associated with lower odds of PBT use versus no radiation treatment. Conclusions: Despite very low overall PBT use in the United States, there were marked differences in PBT use among patients diagnosed with Group 1 indication cancer types by race/ethnicity and geographic region of treatment facility.

D086 Assessing patient-level knowledge of precision medicine in a community health center setting. [Melinda C.](#)

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Factors influencing cancer treatment decisions require comprehension of genetic tests, risk stratification, and treatment options. This comprehension in turn requires understanding of numeracy, genetic literacy, health literacy, and medical trust, all important for acceptance and implementation of precision medicine. Using a mixed methods approach, we sought to identify patient-level factors influencing the understanding of cancer risk and precision medicine among community health center patients. At a community health center in Nashville, Tennessee we enrolled 26 English-speaking patients between the ages of 40-79 years who were either a cancer patient (n=4), had a family member with cancer (n=20), and/or were previously a caregiver for a cancer patient (n=15). The participants enrolled in one of four focus groups, and also completed surveys to assess patient-level understanding of precision medicine, numeracy, and health literacy. We used a three-item health literacy screening questionnaire and the Subjective Numeracy Scale to assess health literacy and numeracy, respectively. Participants were median age 60, 89% African American and 77% female, with 35% having a high school degree or less and 35% a household income of \leq \$15,000. While health literacy was generally high (\leq 15% reported low confidence in filling out medical forms, understanding medical information, or needing help to read the information), 42% felt that genes or genetics had little impact on health and most reported little familiarity with precision medicine (69%), pharmacogenetics (77%), biomarkers (81%) or biobanks (81%). The majority of participants reported that trust in their providers was extremely or very important when receiving genetic tests (77%) and over 60% felt receiving genetic test results was extremely important. Numeracy levels were moderate, with nearly half reporting some discomfort working with fractions and 38% finding numerical information only occasionally useful. The findings suggest that many patients lack familiarity with precision medicine concepts relevant for understanding cancer treatment decisions. Future efforts in digital technologies may be able to help bridge the gap in patient understanding and allow medically underserved populations to have equitable opportunities for precision medicine.

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D087 Racial/ethnic differences in ovarian cancer incidence and mortality among adult women in the United States, 2001-2016. Fangjian Guo, Abbey B. Berenson, Yong-Fang Kuo. University of Texas Medical Branch, Galveston, TX, USA.

Background: Ovarian cancer is the fifth most common cause of cancer death among US women. Assessing racial/ethnic differences in ovarian cancer incidence and mortality will provide important information regarding improving efforts of prevention, early detection, and treatment in population groups that need to be targeted. Methods: We included adult women diagnosed with ovarian cancer \geq ages 20 from the National Program for Cancer Registries and Surveillance, Epidemiology, and End Results Incidence Incidence--U.S. Cancer Statistics 2001-2016 database. Incidence of ovarian cancer was age- adjusted to the U.S. standard population. Joinpoint analyses were used to assess incidence trend and calculate annual percentage change (APC). Hazard ratios (HRs) and 95% CIs were estimated from the Cox proportional hazard models for comparing differences in 5-year survival probability across races/ethnicities, after controlling for age at diagnosis and county of residence. Results: Among adult women \geq 20 years old, ovarian cancer incidence decreased among Hispanics, non-Hispanic Whites, and non-Hispanic Blacks, from 9.4 per 100,000 in 2001 to 6.9 per 100,000 in 2016 (APC -1.8, 95% confidence interval (CI) -2.2 - -1.5) in Hispanics, from 11.0 per 100,000 in 2001 to 7.6 per 100,000 in 2016 (APC -2.1, 95% CI -2.3 - -1.9) in non-Hispanic Whites, and from 8.0 per 100,000 in 2001 to 6.6 per 100,000 in 2016 (APC -1.3, 95% CI -1.6 - -1.0) in non-Hispanic Blacks. No joinpoints were found among those racial/ethnic groups. Among ovarian cancer patients, observed 5-year ovarian-cancer-specific survival was 51.6% (95% CI 50.4%-52.8%) in Hispanics, 44.7% (95% CI 44.2%-45.1%) in non-Hispanic Whites, and 37.4% (95% CI 36.1%-38.8%) in non-Hispanic Blacks (HR for dying from ovarian cancer, Whites vs. Blacks 0.68, 95% CI 0.66-0.71; Hispanics vs. Blacks 0.73, 95% CI 0.69-0.76). Similar patterns were also observed for 5-year overall survival and 5-year relative survival among adult ovarian patients. Conclusions: Ovarian cancer incidence decreased across all three racial/ethnic groups from 2001 to 2016. Although Non-Hispanic Blacks had the lowest ovarian cancer incidence, they had the lowest survival rate. More efforts are needed to focus on this underserved population to target early detection and treatment of ovarian cancer.

D088 Analysis of tumor mutational burden, cancer immunotherapy use and outcomes based on genomic ancestry in non-small cell lung cancer patients treated in community practice in the United States. Nicole Richie, Patricia Luhn, Uzor Ogbu, Gerren Wilson, William Capra, Mark Lee, Otis Brawley. Genentech, South San Francisco, CA, USA.

Introduction Racial disparities in cancer care and outcome are multifactorial and well documented, being attributed to social determinants, access to and quality of care. In addition, variation in biologic drivers by self-reported race/ethnicity or genetic ancestry may contribute to inequities in outcomes. Differences in tumor mutational burden (TMB), an important predictor of response to cancer immunotherapy (CIT), have been reported in non-small cell lung cancer (NSCLC) patients of different genomic ancestries. The impact of differing TMB-levels on outcomes and underlying cause is unknown, though smoking is associated with increased TMB. This study seeks to describe the receipt of CIT-containing regimens and the distribution and relationship of TMB with overall survival in NSCLC patients across ancestral groups. Methods 3962 patients with advanced NSCLC diagnosed between 1/1/11 and 4/30/19 were selected from the de-identified Flatiron Health-Foundation Medicine (FMI) linked clinicogenomics database. TMB was categorized as high or low (16mutations (mut)/ megabase (Mb) cut off). Genomic ancestry was classified as previously described by FMI. CIT use and TMB status was described by ancestry and the association of TMB status with overall survival (OS) from diagnosis was estimated using Cox proportional hazards models. Analyses were further stratified by genomic ancestry (European vs. Non-European) and receipt of CIT at any point after advanced diagnosis date. Results The study population was 72% European ancestry (EUR), 8% African (AFR), 5% American (AMR), and 3% Asian (ASN). Genomic ancestry was largely correlated with self-reported race. The use of CIT-containing regimens was similar across ancestries, from 36% - 45% for those of ASN and AFR ancestry, respectively. TMB levels varied across ancestry groups; patients of AFR ancestry had the highest median TMB level (9.6 mut/Mb, [Interquartile Range: 4.4 - 15.7]), whereas ASN had lowest (3.5 mut/Mb, [2.6, 13.0]). Median TMB for EUR patients was 7.8 mut/Mb [3.5 - 13.9]. Similar trends were observed among patients with a history of smoking, though overall TMB levels were higher. TMB-high patients accounted for 24% of those of AFR, 20% for EUR, and 27% and 5% for AMR and ASN ancestry respectively. TMB-high was associated with better survival in patients who had ever received CIT (0.63, [95% CI: 0.52, 0.77]). These results were consistent when stratified by EUR (0.62 [0.50, 0.77]) and non-EUR ancestry (0.59 [0.34, 1.02]). Conclusions We observed different levels of TMB across ancestral groups.

Differences in prevalence of smoking may be a contributing factor. TMB-high was equally predictive of improved OS among patients receiving CIT for those of EUR and non-EUR ancestry. There were no observed differences in receipt of CIT based on genomic ancestry in this population. These results suggest that addressing reported inequitable access to TMB testing among African American NSCLC patients may improve racial/ethnic disparities in NSCLC outcomes.

D090 Can exposure to environmental chemical and biologic agents increase the risk of prostate cancer and its outcomes?

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Introduction: It is generally believed that the environment plays some role in the development of prostate cancer, but the extent of that role is not understood. The objective of this study is to perform a systematic review of the literature to bring together the best available evidence on the suspected relationship between the environment and prostate cancer. **Methods:** PubMed, Web of Science, CINAHL, CancerLit, and the Cochrane Library were searched. We examined peer-reviewed English language studies examining the association between the environment and prostate cancer risk between 1990 and May 31, 2019. We further included studies if they met all of the following criteria: (1) considered at least one chemical or biological agents; (2) reported risk for incidence, mortality, serious adverse events, or hospital admissions. We extracted data from each study, including location, health outcome, and risk estimates. Results of the studies were combined using a qualitative synthesis due to the variation across and within outcomes in reported results. **Results:** We assessed 198 studies, of which we selected 51 for an in-depth review. Thirty-four articles fulfilled our predetermined inclusion criteria and were included in the qualitative synthesis. Of the 34 articles, 16 were prospective cohort studies, and 9 were case-control studies. These 34 articles explored a number of environmental agents including chemicals, ionizing radiation, electromagnetic fields, and infectious agents. Chemical exposures included second-hand exposure to industrial chemicals and to environmental carcinogens. Several of the studies (n=21) were based on ecological comparisons and did not provide a quantitative risk estimate. Exposure to ionizing radiation and electromagnetic fields showed no association with risk of prostate cancer. There is an inconsequential link between

pesticides and an increased risk of prostate cancer through a potential endocrine-disrupting mechanism based on androgen imbalance. In most cases the overall evidence was inadequate in number, reported outcomes, quality of study to establish a relationship between a specific environmental agent and risk of prostate cancer; the evidence from chemical exposure studies was not sufficient to draw an inference. **Conclusions:** Overall, the reviewed epidemiologic evidence provides a weak level of evidence supporting the hypothesis that there is a causal relationship between environmental exposures and increased risk of prostate cancer. Because a large number of individuals are exposed to suspected environmental carcinogens, investigation of the association between prostate cancer and environmental chemical and biological agents deserves to be a high priority. Such investigations do not only have health implications but can also provide a fundamental understanding of the process of prostate carcinogenesis.

D091 The impact of distance to hospital on cervical cancer outcomes.

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Objective – To determine the impact of distance on cervical cancer outcomes in addition to identifying potential factors by exploring age-specific differences **Methods –**Using the National Cancer Database (NCDB) for the years 2004 to 2013, cervical cancer incidence and mortality rates were calculated, and potential factors were investigated by using multivariable logistic regression analysis. **Results –** A total of 90,076 white and black women (≥20 years old) were diagnosed with cervical cancer from 2004 to 2013 (82.7% and 17.3% respectively). Race, region, insurance, income, facility type, comorbidity, cancer stage, age, and year of diagnosis were significantly associated with cervical cancer mortality. Only cancer stage was significantly associated with mortality for both white and black women across age groups. Race, insurance, facility type, comorbidity, cancer stage, distance to hospital, and age were significantly associated with five-year survival rates. **Conclusions –** This study confirmed the impact of distance to hospital on five-year survival rates. Both white and black women living more than 50 miles away showed significant lower five-year survival rates than those who lived in less than 10 miles (OR=0.82, 95%CI 0.73 to 0.91; OR=0.59, 95%CI 0.45 to 0.77 respectively).

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D092 Racial disparities in HIV-associated

lymphoma. Gregory S Calip¹, Jifang Zhou¹, Karen I Sweiss¹, Pritesh R Patel¹, Sina Ith¹, Colin C Hubbard¹, Naomi Y Ko², Brian C-H Chiu³. ¹University of Illinois at Chicago, Chicago, IL, USA, ²Boston University School of Medicine, Boston, MA, USA, ³The University of Chicago, Chicago, IL, USA.

Introduction: Human immunodeficiency virus (HIV)-related lymphomas are more frequently diagnosed at advanced stages and HIV is associated with lower survival in Hodgkin and non-Hodgkin lymphoma. Less is documented on how the impacts of HIV on lymphoma outcomes differ between racial groups in the United States. Methods: We conducted a hospital-based retrospective cohort study of adults ages 18 years and older diagnosed with Hodgkin and non-Hodgkin lymphoma between 2004 and 2016 using the National Cancer Database. Information on demographic, socioeconomic and clinical characteristics were collected including histologic subtype, stage, initial treatments and whether lymphoma diagnoses were HIV-associated and/or patients were HIV positive. For the three most frequent HIV-associated lymphoma subtypes – Hodgkin lymphoma (HL), diffuse large B-cell lymphoma (DLBCL) and Burkitt lymphoma (BL) – modified Poisson regression models were used to estimate adjusted rate ratios (RR) and 95% confidence intervals (CI) for the race-specific impacts of HIV on risk of advanced stages, B-symptoms at diagnosis, and receipt of chemo-immunotherapy. We measured Kaplan Meier survivor functions and estimated adjusted hazard ratios (HR) and 95% CI for the impact of HIV on overall survival by race in Cox proportional hazards models. Results: From an overall cohort of 579,123 lymphoma patients, 18,826 (3.3%) were HIV-associated. Compared to patients with non-HIV-associated lymphoma, HIV positive patients were younger (median 47 vs. 64 years) and more likely to be male (77% vs. 54%), black (34% vs. 8%), Hispanic (15% vs. 6%), have Medicaid or be uninsured (35% vs. 10%) and live in zip codes with the lowest quartile of median income (30% vs. 16%) and lowest quartile of attained education (34% vs. 19%). Among patients with HIV-associated lymphomas, black and Hispanic patients were diagnosed at lower median ages (45 and 44 years, respectively) compared to white patients (49 years). Rates of chemo-immunotherapy treatment for HIV-associated lymphoma were lower among black (68%) and Asian/Pacific Islander patients (63%) compared to white patients (73%). Black patients with HIV-associated lymphomas had consistently lower five-year survival across subtypes, a trend not seen with non-HIV-associated lymphomas. In multivariable models accounting for differences in stage and treatment, HIV was associated with a 33% increase (95% CI 10% to 61%) in risk of all-cause mortality among

black patients with HL. Among white, Hispanic and Asian/Pacific Islander patients with HL, HIV was not associated with a statistically significant increase in overall mortality. Conclusions: Among HIV-associated lymphoma patients, we observed racial differences in outcomes with black patients experiencing the lowest five-year survival, a trend not seen in non-HIV-associated lymphomas. In adjusted analyses, HIV was associated with significantly increased overall mortality among black patients with HL but not in other racial groups.

D093 Who carries the excess cancer risk burden: Implications of disparities in polycyclic aromatic

hydrocarbon exposure. Larisa M Gearhart-Serna¹, Moises Tacam Jr.², Theodore A Slotkin¹, Gayathri R Devi¹. ¹Duke University School of Medicine, Durham, NC, USA, ²Duke University, Durham, NC, USA.

Polycyclic aromatic hydrocarbons (PAHs) are a toxic and ubiquitous class of environmental chemicals sourced from industrial practices, tobacco smoke, grilled and smoked meats, car exhaust, and other human and natural sources. Many PAHs are also considered carcinogenic. In this study, we sought to identify the most vulnerable populations for high PAH exposure in the U.S. and resultant excess cancer risk. Urinary biomarker data were collected from 2005-2014 by the U.S. CDC National Health and Nutrition Examination Survey for metabolites of four PAHs: naphthalene, fluorene, phenanthrene, and pyrene. We conducted reverse dosimetry modeling to estimate exposure to the four PAHs, singly and in sum, for each adult individual in the dataset, expressed as a daily intake rate. These were calculated using known excretion fractions and molecular weights specific to each PAH parent or metabolite compound, standardized adult urine output, and individual body weights. We then stratified these exposures by demographic factors (age, gender, race/ethnicity, education level, and family income), in addition to lifestyle factors (smoking status, exposure to secondhand smoke, and BMI). We analyzed these stratified demographic and lifestyle groups according to effect size, and analyzed subpopulations within each group by principal component analysis, so as to determine the most influential factors and the most vulnerable subpopulations for high PAH exposure. We then calculated lifetime excess cancer risk for subpopulations based on their PAH exposure using benzo(a)pyrene (BaP) toxic equivalency factors, BaP cancer slope factor, and a 70-year lifespan estimation. There were 8570 individuals in the final dataset, although smoking status information available for 3818 of these individuals. Unsurprisingly, smokers and those exposed to secondhand smoke had the highest total PAH intake rates. 36.9% of PAH

exposure variance was explained by the demographic and lifestyle factors included in this analysis, with an additional 4.8% explained by smoking status and secondhand smoke exposure interactions with other demographic variables such as race/ethnicity. However, only 7.5% of the PAH exposure variance was explained when all smokers and those exposed to secondhand smoke were removed from the dataset, indicating the strength of association between tobacco smoke exposure and PAH intake. Demographic subpopulations such as those who did not complete high school, middle-income bracket (\$45-75,000), and other Hispanic racial/ethnic identity had higher PAH exposure and resultant excess cancer risk, while higher income bracket (75,000+), those with a college degree, Asian identity, and females in general had lower PAH exposure levels and lower excess cancer risk. These results suggest that, in addition to smokers and those exposed to secondhand smoke, there are demographic subpopulations with disproportionately high PAH exposure and resultant excess cancer risk burden, which is a public health concern.

D094 Associations among state-level racial inequality, individual-level unfair treatment, and incident breast cancer in a risk-enriched cohort.

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Background: There is a small but growing body of evidence suggesting that structural inequality is associated with racial disparities in breast cancer stage at diagnosis and mortality. Less is known about the potential relationship between structural inequality and breast cancer incidence or subtypes. To address this gap, we developed a multidimensional state-level measure of racial inequality and assessed whether higher levels of inequality are associated with 1) higher odds of an invasive breast cancer diagnosis, and 2) among those diagnosed, higher odds of an estrogen receptor negative (ER-) vs. positive (ER+) tumor. Methods: The Sister Study is a longitudinal cohort of women who had a sister diagnosed with breast cancer, but did not have a personal history of the disease at enrollment. Leveraging this cohort, we generated state-level composite scores (range = 1-5) summarizing differences between non-Hispanic white and black residents across four domains: educational attainment, employment & occupational status, political participation, and incarceration. Data for the racial inequality measure were drawn from publicly available sources and linked to the participants'

state of residence at the time of enrollment. An individual-level measure of unfair treatment due to race was included as a proximal exposure to racial inequality. Invasive breast cancer diagnoses and subtypes were recorded through September 2016. The final analytic sample was limited to non-Hispanic white (n= 38,760) and black (n=4,061) Sister Study participants and their states of residence (n=40). Two-level population average models were constructed to assess the relationship among state- and individual-level factors and the odds of 1) an invasive breast cancer diagnosis (n=1,475) and 2) ER subtype among women with invasive breast cancer (1,278 ER+ cases; 197 ER- cases). Results: Adjusting for self-reported race, education, age, and epidemiologic risk factors (e.g., breast feeding history, menopausal status), we found that women residing in states with higher levels of racial inequality did not have higher odds of invasive breast cancer. However, among women diagnosed with an invasive breast cancer, we found higher odds of ER- vs. ER+ subtype among women living in states with higher levels of racial inequality (OR range = 1.7 – 2.6 for inequality composite scores of 3-5 vs. 1; p-values of <0.001 to 0.04). The proximal measure of unfair treatment due to race was also a significant factor in the fully-adjusted model, with women reporting 2 or more incidents of unfair treatment having a 2.6 times higher odds of an ER- diagnosis than women reporting no such incidents. Conclusions: In this relatively small sample of invasive breast cancer cases, structural and interpersonal experiences with racial inequality were associated with greater odds of the ER- vs. ER+ subtype, but not with the overall odds of an invasive breast cancer diagnosis. Reanalysis using a longer follow-up period may provide greater insight into this novel association.

D095 Plasma levels of polychlorinated biphenyls (PCBs) and breast cancer mortality: The Carolina Breast Cancer Study.

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Background: Polychlorinated biphenyls (PCBs) are a group of 209 synthetic organic chemicals, several of which are known carcinogens or endocrine disruptors. PCBs are hypothesized to influence the risk of developing breast cancer; however, whether PCBs influence the risk of mortality following breast cancer is poorly understood. We examined plasma levels of 17 PCB congeners in association with mortality among women who participated in the population-based Carolina Breast Cancer Study (CBCS). Methods: Participants included 456 white and 292 black women who were diagnosed

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with primary invasive breast cancer from 1993-1996, and who had PCB and lipid measurements from blood samples obtained on average 4.1 months after diagnosis. Using the National Death Index, we identified 392 deaths including 210 from breast cancer, over a median follow-up of 20.6 years. We used Cox regression to estimate covariate-adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for all-cause and breast cancer-specific 5-year mortality, and 20-year mortality conditional on 5-year survival in relation to tertiles and continuous ln-transformed lipid-adjusted PCB levels. We also examined effect measure modification by race. Results: The highest (vs. lowest) tertile of PCB118 was associated with a 5-year breast cancer-specific mortality HR of 1.86 (95% CI=1.07-3.23). One-ln unit increases in PCB74, PCB99, PCB118, and total PCBs were associated with 5-year breast cancer-specific mortality HRs ranging from 1.33 (95% CI=1.02-1.74) for PCB74 to 1.40 (95% CI=1.02-1.92) for PCB118. By race, a one-ln unit increase in PCB74 was associated with a HR of 1.47 (95% CI=1.01-2.14) among black women and with a HR of 1.19 (95% CI=0.79-1.77) among white women (P-Interaction=0.05). Continuous PCB levels were associated with 20-year conditional all-cause mortality HRs ranging from 1.20 (95% CI=1.03-1.41) for a one-ln unit increase in PCB182+PCB187 to 1.37 (95% CI=1.12-1.68) for a one-ln unit increase in PCB118. PCBs were not associated with 5-year all-cause mortality or with 20-year conditional breast cancer-specific mortality. Conclusion: PCBs may increase the risk of short-term breast cancer-specific mortality as well as long-term all-cause mortality among women with breast cancer.

D096 Disparities in toxic heavy metal burden and breast cancer risk: Findings from the Metropolitan Chicago Breast Cancer Registry. Alpana Kaushiva¹, Jacob Kresovich², Serap Erdal¹, [Garth Rauscher](#)¹. ¹University of Illinois at Chicago, Chicago, USA, ²National Institute of Environmental Health Sciences, Raleigh, USA.

BACKGROUND: Evidence regarding associations of ambient toxic heavy metals (THMs) and breast cancer (BC) incidence is mixed. Observed inconsistencies may be a consequence of utilizing ambient THM levels collected close to time of BC diagnosis, and not incorporating an appropriate latent period. In addition, most studies have not examined associations of ambient THMs and BC incidence stratified by estrogen receptor (ER) and menopausal status, and have examined relatively homogenous populations of non-Hispanic White (nHW) women. We examined time-to-event associations of ambient THM concentrations and BC subtypes among women enrolled in the racially/ethnically diverse Metropolitan Chicago Breast Cancer Registry (MCBCR) cohort. **METHODS:**

Using the Environmental Protection Agency's 2005 National Air Toxics Assessment (NATA), we examined census tract-level ambient concentrations for 11 THMs (antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, and selenium). For women enrolled in MCBCR between 2003-2007, residential addresses were geocoded and matched to census-tract estimates of the ambient THM concentrations. Women were followed to time of BC diagnosis or December 31, 2014. Cox proportional hazards (PH) regression models were used to estimate hazard ratios (HR) and 95% confidence intervals (95% CI), adjusted for age and race. **RESULTS:** Over a mean follow up time of 10 years, there were 6,579 incident BC cases (with a mean time to diagnosis of 3 years) and 205,095 cancer-free women in the cohort. Over a quarter of our study population was African American (AA), and nearly 10% were Hispanic. Compared to nHW women, AA women were more likely to reside in census tracts with higher quartile ambient concentrations of beryllium, cadmium, chromium, cobalt, lead, manganese, and mercury ($p < 0.001$ for all). Similarly, Hispanic women were more likely to reside in census tracts characterized by higher quartile concentrations of beryllium, cadmium, chromium, lead, manganese, mercury, and nickel ($p < 0.001$ for all). In age and race adjusted models, compared to women residing in census tracts with the lowest quartile of ambient concentrations, increased BC incidence was observed for women residing in census tracts with the highest quartile of ambient concentrations of antimony (HR=1.08, 95% CI 1.00-1.17), beryllium (HR=1.09, 95% CI 1.01-1.18), cadmium (HR=1.07, 95% CI 1.00-1.17), lead (HR=1.18, 95% CI 1.09, 1.28), and nickel (HR=1.24, 95% CI 1.15-1.33). In models stratified by ER status and menopausal status, associations with beryllium, lead, and nickel were stronger for ER positive post-menopausal BC. Associations with antimony and cadmium were stronger for ER-negative BC risk. **DISCUSSION:** We found that African American and Hispanic women were disproportionately exposed to higher levels of ambient THMs, which in turn were associated with specific subtypes of BC. Future studies will focus on determinants of these observed environmental disparities in the MCBCR cohort.

D097 Association between high mammographic density and environmental chromium and arsenic exposure in a pilot study of women living in rural communities. [L. Joseph Su](#), Tung-Chin Chiang, Lora J Rogers, Gail A Runnells, Susan A Kadlubar, Zoey Crystal, Christopher Wardell, Sharp Malak. University of Arkansas for Medical Sciences, Little Rock, AR, USA.

Background Environmental contamination with heavy metals, such as metalloid arsenic (As), cadmium (Cd), and chromium

(Cr), in soil in the Mississippi River Delta region has been documented by the US Geological Survey. Rural residents are more likely to be exposed throughout their life than those who live in urban cities because much of the vegetation grown in this area has a potentially higher content of these heavy metals. At the same time, this region also experiences higher breast cancer (BC) disparity when compared to the other parts of the country. Mammographic density (MD) is one of the strongest risk factors for nonfamilial BC and it is also related to long-term prospective increases in tumor incidence, independent of its masking effects on detection. High MD thus is directly related to breast carcinogenesis. Methods Urine samples and lifestyle factors were obtained from a subcohort of women recruited through a mobile mammography unit into the Arkansas Rural Community Health Study cohort. Mammography at enrollment is available on everyone in this subcohort. Urinary samples were analyzed for heavy metal exposure, including As, Cd, and Cr concentration using Fisher-Thermo inductively coupled plasma mass spectrometry (ICP-MS). All samples were analyzed in duplicates and concentrations were presented as microgram/gram creatinine. Mammographic density was assessed by staff radiologist based on the American College of Radiology (ACR) Breast Imaging Reporting and Data System (BI-RADS) and verified with the LIBRA software, developed by the University of Pennsylvania. MD was categorized as dichotomous high (C and D) and low (A and B). Multivariable logistic regression was used to calculate odds ratios (OR) and 95% confidence interval (CI). Results Among 189 subjects who have completed follow-up interviews and contributed blood and urine samples, we analyzed urine samples for heavy metal concentration, adjusted for urinary creatinine value and specific gravity. The mean (standard deviation) concentration of Cr, As and Cd were 0.27 (0.04), 0.28 (0.38) and 0.13 (0.11) ppb, respectively. We evaluated the association between MD and three major heavy metals of interest. When comparing the highest tertile urine Cr to the lowest tertile, Cr is positively associated with high MD (OR = 5.50, 95%CI = 1.08, 27.98) after adjusting for age, BMI, race, education, hormonal use, age at menarche, age at last menstrual cycle, and family history of breast cancer. Urine As is also positively associated with high MD (OR = 2.39, 95%CI = 0.98, 5.87, p = 0.06), adjusted for age and BMI. Cd was not significantly associated with MD with the current sample size. Conclusion Cr, As, and Cd are considered as Group 1 carcinogens according to the International Agency for Research on Cancer. This study suggests that there is a significantly increased odds of high MD even at very low levels of exposure to environmental Cr and As. Identifying sources of these contaminants would reduce the risk of breast cancer in rural communities.

D098 Risk of recurrence among South Carolina women with breast cancer from 2002–2010: Findings from a retrospective cohort investigation.

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BACKGROUND: There were approximately 3.5 million breast cancer (BrCA) survivors in the United States in 2016, a number that is expected to increase to 4.5 million by the year 2026. Although there is a relatively high five-year survival rate (89%) for breast cancer, there is still an increased risk of recurrence among subsets of BrCA survivors. The goal of the study is to understand the predictors associated with BrCA recurrence among the urban and rural populations in South Carolina (SC). METHODS: Data from the SC Central Cancer Registry was linked with the SC Medicaid Program and another private payor insurance plan. BrCA recurrence was identified using a previously validated algorithm. The predictors of recurrence among women diagnosed with BrCA from 2002 to 2010 were assessed. The odds ratio and 95% confidence interval (CI) of recurrence in rural communities by regional location was estimated using a multivariable logistic regression model. RESULTS: Overall, 29% (n = 729) of women experience recurrence, while 71% (n = 1780) did not. Age at diagnosis, urban/rural status, regional location, insurance type, and enrollment into the Best Chance Network were all significant predictors of recurrence. For patients living in the Lowcountry region of SC, there was a significant increase in the odds of experiencing recurrence for those residing in rural communities compared to those in urban communities after adjusting for receipt of chemotherapy or surgery and stage (OR: 2.23, 95% CI: 1.40–3.55). CONCLUSION: Our results indicate that geographic location and other demographic factors are significantly associated with recurrence. There is a great need for increasing guidance and support to aid in the understanding and navigation of follow-up care for BrCA survivors. Increased navigational support services and educational resources are needed to eliminate the rural disparity that exists within SC and to improve the outcomes of BrCA survivors.

D099 Excess burden of major cancer risk factors in racial/ethnic minority adult cancer survivors in the United States (2005–2016).

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Background: While major cancer risk factors (CRFs) are well documented in the US general population, their burden in 16.9 million US cancer survivors has not been described. Continued CRF exposure may contribute to recurrence,

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second cancers, and other chronic disease risks. Using US representative surveys, we previously reported high CRF prevalences in cancer survivors. To better target health-promoting interventions, sub-populations of survivors with higher CRF burdens need to be identified, especially racial/ethnic minorities who have higher cancer-specific and other chronic disease mortality rates. Thus, we quantified CRF prevalences and trends in cancer survivors by major US racial/ethnic minorities and compared with non-Hispanic Whites (NHW) over 12 years. Methods: We analyzed data for 455 non-Hispanic Black [NHB], 389 Hispanic, and 1739 NHW cancer survivors (self-reported MD diagnosis of cancer except non-melanoma skin) >20 years old who participated in the 2005-16 National Health and Nutrition Examination Surveys. We estimated unadjusted race/ethnicity-specific prevalences of major CRFs – current smoking, alcohol (>2 drinks/day), overweight/obesity (BMI>25 kg/m²), physical inactivity (<10 mins moderate activity/day), self-reported poor/fair diet, and diabetes history – and prevalence trends. We estimated age- and sex-adjusted CRF prevalence ratios and comparing NHB and Hispanic to NHW survivors using Poisson regression. Results: Median time since diagnosis (8 years) did not differ by race/ethnicity. Hispanic survivors were younger and more likely female compared to NHW and NHB survivors. Adjusting for age and sex, compared to NHW survivors, smoking prevalence was 35% higher in NHB survivors but did not differ in Hispanic survivors, and alcohol prevalence was 44% higher in Hispanic survivors, but did not differ in NHB survivors. In both NHB and Hispanic survivors, prevalences of overweight/obesity (NHB 12%, Hispanic 20%), physical inactivity (27%, 20%), poor/fair diet, (48%, 42%), and diabetes history (121%, 98%) were statistically significantly higher than in NHW survivors. CRF prevalences were significantly higher in NHB and Hispanic compared to NHW survivors over 12 years. Conclusions: CRF prevalences are disproportionately higher in Hispanics and NHB compared to NHW cancer survivors, accounting for age and sex, and these patterns have persisted over time. These US nationally representative data may be used to direct interventions for specific CRFs to specific racial/ethnic minority subpopulations of cancer survivors to increase wellbeing.

D100, PR06 Exposure to phthalates and risk of invasive breast cancer: The Multiethnic Cohort Study. Anna H Wu¹, Adrian A Franke², Chiuchen Tseng¹, Shannon M Conroy³, Yuqing S Li³, Mindy DeRouen⁴, Linda Polfus⁵, Christian Caberto², Daniel Stram¹, Chris Haiman¹, Lynne R Wilkens², Loic Le Marchand², Iona Cheng⁴. ¹University of Southern California, Los Angeles, CA, USA, ²University of Hawaii, Honolulu, Hawaii, USA, ³University of California, Davis, CA, USA, ⁴University of California, San Francisco, CA, USA.

Background: Phthalates (Phth), known endocrine-disruptors, may play a role in breast carcinogenesis. Low molecular weight phthalates (LMWPhth) are commonly found in personal care products while high MWPhth (HMWPhth) are used primarily as plasticizers. Individual Phth may disrupt normal mammary gland development and promote tumorigenesis by binding to and activating the estrogen receptor (ER). Methods: We prospectively examined the association between pre-diagnostic urinary levels of Phth metabolites and breast cancer risk in a case-control study nested within the Multiethnic Cohort (MEC). We measured 11 Phth metabolites and phthalic acid from overnight/first morning urine samples of 798 women with invasive breast cancer (355 Japanese Americans, 218 Whites, 125 Native Hawaiians, 62 Latinos, and 38 African Americans; the latter three groups were combined due to small numbers) and 796 matched controls using an ultra-sensitive isotope dilution orbitrap LCMS assay after hydrolysis from conjugation, extraction and concentration. Average time between urine collection and breast cancer diagnosis was 5.5 years (SD=3.3). Cases and controls were 1:1 matched on area (Hawaii or California), birth year (± 1 year), race/ethnicity, urine type (overnight or first morning), and date of urine collection (± 1 year). Association of LMWPhth (MBP, MiBP, MEP, MMP), HMWPhth (MBzP, MEHP, MEHHP, MEOHP, MECPP, MCMHP, MCHP), and total Phth exposure (LMWPhth + HMWPhth), and phthalic acids with breast cancer risk were examined using conditional logistic regression. All models were adjusted for creatinine levels, demographics, and potential confounders (e.g. education and established breast cancer risk factors). Stratified analyses were conducted by race/ethnicity and ER and progesterone receptor (PR) status. Results: Women in the highest tertile (T3) of total Phth exposure showed a significant increased risk of breast cancer compared to women in the lowest tertile (T1) (HR=1.36, 95% CI: 1.02-1.82). The association was suggested across race/ethnicity with a statistically significant positive association observed in the three smaller groups combined (Native Hawaiians, Latinos, and African Americans) with HR for T2=2.29 (95% CI: 1.27-4.41) and HR for T3=2.42 (95% CI: 1.25-4.70); Ptrend=0.006. By ERPR status, risk associations

tended to be stronger for ER-PR- (n=96 cases) (HR=1.13, 95% CI: 0.89-1.45) than for ER+PR+ (n=694 cases) (HR=1.06, 95% CI: 0.94-1.19) breast tumors. Among the three smaller groups combined, total Phth exposure was associated with a significant increased risk of ER-PR- breast cancer (n=38 cases) (P=0.045). Conclusion: This is one of the first studies of Phth exposure and breast cancer to include large numbers of diverse populations in a single study. Risk patterns were stronger among the combined group of Native Hawaiians, Latinos, and African American and for ER-PR- breast cancer. Better understanding of these differences in risk associations by race/ethnicity and ERPR status is needed.

D101 Breast cancer in Black women: Do risk factors differ for those who have a family history of breast cancer? Gary R. Zirpoli¹, Traci N Bethea¹, Leslie Bernstein², Melissa A Troester³, Christine B Ambrosone⁴, Julie R Palmer¹. ¹Slone Epidemiology Center at Boston University, Boston, MA, USA, ²Beckman Research Institute of City of Hope, Monrovia, CA, USA, ³Lineberger Comprehensive Cancer Center, Department of Pathology and Laboratory Medicine, and Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA, ⁴Department of Cancer Prevention and Control, Roswell Park Comprehensive Cancer Center, Buffalo, NY, USA.

Background: Women who have at least one first-degree relative diagnosed with breast cancer have an almost two-fold risk of developing breast cancer themselves. Therefore, there is particular interest in identifying modifiable factors that can reduce risk. To date, most studies of breast cancer risk in women with a family history of breast cancer have focused on White women. Methods: We pooled questionnaire data on Black women from three case-control studies (Women's Contraceptive and Reproductive Experiences, Carolina Breast Cancer Study, and Women's Circle of Health Study) and nested case-control data from the prospective Black Women's Health Study for an analytic sample of 5,015 invasive breast cancer cases and 15,354 controls; 15.9% of cases and 9.4% of controls reported a first-degree family history of breast cancer ("family history"). We used logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for risk of breast cancer overall, and by estrogen receptor (ER) status, within strata of family history. All models were adjusted for age and study. Additional covariates were body mass index (recent and at age 18), adult height, smoking, alcohol consumption, parity, breastfeeding, age at first birth, age at menarche, interval between menarche and first birth, age at menopause, and history of benign breast disease. Results: ORs were consistent among women with and without a family history for most

factors. However, associations of parity and breastfeeding with risk of ER negative breast cancer were stronger among women with a positive family history: the OR for ever parous vs. nulliparous was 1.63 (1.11-2.39) among women with a family history and 1.31 (1.13-1.53) among those without. In both groups, the elevated OR associated with parity was reduced if the women had breastfed at least one child. The ORs for ER negative breast cancer associated with parity without breastfeeding were 1.86 (1.25-2.77) and 1.43 (1.22-1.67), among women with and without a family history of breast cancer, respectively (p-interaction >0.05). Additional control for other reproductive factors did not materially change the estimates. Breastfeeding was not associated with risk of ER positive breast cancer in either group. Conclusion: As has been shown previously, parous women were found to be at increased risk of ER negative breast cancer, with the increase attenuated by breastfeeding. Stratification by family history of breast cancer indicated that the associations may be stronger among women with a first-degree family history, although interactions were not statistically significant. Findings from the present study demonstrate that Black women who already have a higher than average baseline risk of ER negative breast cancer due to their familial history may favorably modify their risk by breastfeeding.

D102 Lower acculturation is associated with lower aerobic physical activity among recent Latino immigrant cancer survivors. Shreya Desai, Mariana Vazquez, Daphne C Hernandez, Lorraine R Reitzel, Rosenda Murillo. University of Houston, Houston, TX, USA.

Introduction: Latino cancer survivors engage in less physical activity than non-Latino cancer survivors. Previous research has shown that higher acculturation is associated with higher leisure-time physical activity among foreign-born Latinos. However, there is limited research on the association of acculturation with leisure-time aerobic and muscle-strengthening activity among foreign-born Latino cancer survivors, for whom the acculturation and physical activity association may be influenced by lifestyle changes related to cancer survivorship. Therefore, we examined whether acculturation was associated with aerobic and muscle-strengthening physical activity among Latino cancer survivors. Methods: We used cross-sectional data from the 2008-2015 National Health Interview Survey (n=1,293). Participants were individuals that self-identified as Latino, ≥20 years old, and not pregnant. Cancer diagnosis was assessed by the survey variable, "Ever told by a doctor you have cancer?" Nativity (US-born, foreign-born) and years living in the US (<10 years living in US, ≥10 years living in US) were used as proxies of acculturation. Aerobic physical

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activity was measured based on self-reported minutes of moderate-to-vigorous aerobic physical activity engaged in per week, then categorized into none, some activity, and meeting the aerobic activity guideline. Muscle-strengthening activity was measured based on self-reported frequency of muscle-strengthening activity per week, then categorized into meeting and not meeting the muscle-strengthening guideline. Cutoffs for meeting the aerobic and muscle-strengthening guidelines were based on the 2018 Physical Activity Guidelines for Americans. Logistic regression models were used to examine the association of acculturation with aerobic and muscle-strengthening activity among Latino cancer survivors. Models were adjusted for age, sex, education, and Hispanic subgroup. Results: Approximately 33% of the sample reported meeting the aerobic activity guideline, and 15% reported meeting the muscle-strengthening guideline. Foreign-born cancer survivors living in the US <10 years were significantly less likely to meet the aerobic physical activity guideline (Odds Ratio [OR]: 0.26, 95% Confidence Interval: 0.10-0.67) and to engage in some aerobic activity (OR: 0.38, 95% CI: 0.16-0.89), compared with US-born Latino cancer survivors. There was no significant association between acculturation and muscle-strengthening activity. Conclusion: Recent Latino immigrants with a history of cancer are less likely to engage in aerobic physical activity compared with their US-born counterparts. Research is warranted on the barriers to aerobic physical activity among recent Latino immigrant cancer survivors.

D103 Retrospective study of patients with esophageal squamous cell carcinoma in an urban safety net county hospital. Divya Ayyala¹, Caron Park², Yanling Ma¹, Gregory Idos¹, Anisa Shaker¹. ¹LAC USC, Los Angeles, CA, USA, ²CTSI USC, Los Angeles, CA, USA.

Introduction: Esophageal squamous cell carcinoma (ESCC) accounts for 90% of esophageal cancers worldwide but is less common in the developed world. Our aim was to report patient and tumor characteristics of individuals diagnosed with ESCC within the underserved Los Angeles County population. Methods: Review of the hospital pathology database identified 65 cases of patients ages 18-80 with a pathologic diagnosis of ESCC from 2003-2015. A retrospective chart review of electronic health records was conducted excluding patients of unknown ethnicity leaving 61 patients. Patients were characterized by gender, age, alcohol and tobacco use, and family history. Endoscopy and pathology reports were reviewed to confirm tumor location, length, and pathological staging. Frequency counts and percentages were reported for categorical characteristics.

A chi-square test or Fisher's Exact test was performed to assess if characteristic variables differed by ethnicity. Results: Patients identified with ESCC in our cohort were predominantly Hispanic (59%, n=36) and 41% were non-Hispanic (n=10 Asian, n=10 African Americans, and n=5 Caucasian). ESCC was more commonly diagnosed in males vs. females in Hispanics and non-Hispanics (83.3% and 80% vs 16.7% and 20%, p=0.75). Age of diagnosis was between the ages of 18-60 years in nearly 56% and greater than 60 years in 44% of Hispanics and non-Hispanics (p=0.97). Most Hispanics and non-Hispanics had exposure to alcohol (74.1% and 85%, p=0.48) or tobacco (53.9% and 68.2%, p=.31). Most Hispanic and non-Hispanics did not have a family history of cancer (72% and 80%, p=0.73). Tumor location was most often proximal in Hispanic and non-Hispanics (66.7% and 83.3%, p=0.16) and of similar length (p=0.29). Most tumors in both Hispanic and non-Hispanic patients were moderately/poorly differentiated (82.9% and 91.3%, p=0.46). Hispanics were less likely to present with metastatic ESCC as compared to non-Hispanic patients (42.3% vs. 75%, p=0.03). Conclusion: ESCC in both groups within the Los Angeles County population were diagnosed most often in the proximal esophagus of males with history of exposure to alcohol and/or tobacco. Despite similar patient and tumor characteristics, ESCC in Hispanics was less often metastatic at the time of diagnosis compared to non-Hispanics. Despite the small numbers, our study is one of the few to include a large cohort of Hispanics and support further investigation of factors in different ethnicities that may be protective against advanced disease.

D104 Presentation, treatment, and survival of hepatocellular carcinoma (HCC) in a diverse population: Experience of a single transplant center. Afsaneh Barzi, Ravi Patel, Varsha Tulpule, Robert Albertian, Bo Yu, Gwendolyn Lynch, Anthony El-Khoueiry, Songren Wang, Veronica Wendy Setiawan. USC, Los Angeles, CA, USA.

Background: HCC has pathognomonic imaging and predominantly non-surgical treatment paradigms. Most patients do not have histological diagnosis, an integral part of case identification for population based cancer registries. The unique patterns of diagnosis and treatment may hamper population-based study of HCC outcomes and patterns of care. We examined racial differences in the HCC underlying etiology, presentation, treatment, and outcome in a diverse patient population in a single transplant center. Methods: HCC patients who were diagnosed/treated at Norris Comprehensive Cancer Center between 2003-2018 were identified from cancer registry. Registry data including

vital status were linked with medical records. Demographics, stage at diagnosis [Barcelona Clinic Liver Cancer stage (BCLC) and Tumor Node Metastasis (TNM)], underlying etiology [hepatitis C (HCV), hepatitis B (HBV), nonalcoholic steatohepatitis (NASH), alcoholic liver disease], treatment information, and vital status were retrieved. The chi-square test was used to compare characteristics of patients by race. Multivariable Cox's models were used to identify factors associated with overall survival. Results: A total of 619 patients (152 non-Hispanic whites (NHW), 285 Hispanics, 158 Asians, and 24 African Americans) were included in the analysis. The median follow-up was 27.0 months. The average age at diagnosis was 63 years, and 76% of patients were male. Underlying etiology varied significantly across racial groups ($P < 0.0001$); HCV was the most common etiology in African Americans (79%), NHW (70%), and Hispanics (52%), while HBV was the main etiology in Asians (54%). The proportion of NASH-related HCC was 13% in Hispanics, 8% in NHW, 4% in African Americans, and 3% in Asians. There was no significant difference in TNM stage at presentation, however, compared to NHW (36%), Asians (48%) and Hispanics (52%) were more likely to be diagnosed with Barcelona stage A ($P \leq 0.021$). Median AFP values at presentation was highest in African Americans and lowest in Hispanics (P heterogeneity ≤ 0.033). Only 7% of patients received no treatment, 49, 26, and 19% of patients received locoregional, systemic, or transplant respectively. There was no difference in access to these treatments by race, despite significant differences in the insurance status. In the multivariate analyses, higher stage at presentation, NASH-related HCC, and non-transplant treatment were associated with worse survival. Surveillance for HCC showed trend for improved survival ($P = 0.057$). Conclusion: Among patients with appropriate and similar access to care prognosis of HCC is driven by stage, underlying etiology, and curative treatment. Surveillance may improve survival in patients with appropriate access to care.

D105 Differences in receipt of surgery contribute to survival disparities in esophageal and gastric cancers. John Bliton, Peter Muscarella, Michael Parides, Katia Papalezova, John McAuliffe, Haejin In. Montefiore Medical Center, Department of Surgery, Bronx, NY, USA.

Introduction: Mortality disparities for gastrointestinal cancers are well described. Differences in rates of surgery across race and ethnicity may contribute to this phenomenon. In order to evaluate this, we assessed the extent to which the mortality disparity among racial/ethnic groups for gastrointestinal cancers are due to differences in operative rates. Methods:

Data for patients with stage I-III esophageal and gastric cancer diagnoses between 2004-2015 were obtained from National Cancer Database. Cancers were categorized in 3 groups: mid-esophageal (ME) cancers, distal third of esophagus and cardia gastric cancers (DEC), and non-cardia gastric (NCG) cancers. Variables included demographics, receipt of surgery, tumor stage and characteristics, and hospital factors. The racial disparity in survival was measured as the hazard ratio (HR) for Black, Latinx, and Asian/Pacific Islander patients compared to White patients. A mediation analysis was performed to quantify the contribution of variables to the observed disparity between minority and White patients. The magnitude of the contributions was estimated using two methods: the change in HR with (1) the addition of each variable of interest to a model only adjusted by age and year, and (2) the removal of each variable from a multivariate model that included all variables. Factors associated with undergoing surgery were also examined using a logistic regression model. Results: A total of 124,862 patients were included (20,852 with ME, 74,427 with DEC, and 29,583 with NCG). Black patients were more likely to be from lower-income and urban areas and had lower operative rates in all cancers. The observed HRs for Black patients compared to White patients were 1.42 (95% CI 1.36-1.49) for ME, 1.36 (1.31-1.43) for DEC and 1.01 (0.97-1.05 – no observed disparity) for NCG tumors, adjusting for age and year of diagnosis. Only Black race/ethnicity was associated with a mortality disadvantage compared to White patients. Without adjustment for any additional variables, receipt of surgery accounted for more than half of the observed survival disparity for tumors of the esophagus and cardia (Δ HRs for ME: 0.27, DECS: 0.25 and NCG: 0.07). After adjustment for tumor, patient and hospital factors, receipt of surgery remained the single strongest contributor to the Black/White disparity in survival for all cancers (Δ HRs for ME: 0.070, DEC: 0.091 and NCG: 0.07). On logistic regression, Black patients were less likely to have received surgery after adjusting for other variables compared to White patients (ME aOR: 0.41 (0.37-0.46), DECS aOR: 0.42 (0.39-0.46), and NCG aOR: 0.79 (0.73-0.86)). Conclusions: Observed survival disparities in upper GI cancers may be due to fewer surgeries being performed for Black patients. Addressing differences in receipt of surgery for stage I through III esophageal and proximal stomach cancer has potential to mitigate cancer mortality disparities.

D106 Divergent biology in ethnically diverse populations is central to health disparities in pancreatic ductal adenocarcinoma. Miles E Cameron¹, Patrick W Underwood¹, Michael U Maduka¹, Steven J Hughes¹, Andrea

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N Riner¹, Jennifer B Permeth², Andrew R Judge¹, Jose G Trevino¹. ¹University of Florida College of Medicine, Gainesville, FL, USA, ²Moffitt Cancer Center and Research Institute, Tampa, FL, USA.

Introduction: Pancreatic ductal adenocarcinoma (PDAC) is a devastating diagnosis with a five-year survival rate below 9%. Among various ethnic groups there are differing incidence and mortality rates that underpin a patient's overall prognosis. Blacks have higher incidence and mortality rates and a worse prognosis compared to Whites. Conversely, Hispanic/Latino patients have the lowest recorded incidence and mortality rates. Though well recognized by experts, these discrepancies are poorly understood and unaccounted for by socioeconomic means. Therefore, we hypothesize that divergent biology drives the observed disparities in PDAC. **Methods:** Patients with PDAC that underwent surgery at our institution between 2010 and 2017 were included in this retrospective study. Surgical pathology reports were reviewed, and cases were matched by age, gender, and tumor grade. Psoas muscle indices (PMI) were measured from pre-operative CT scans. Baseline indices for respective ethnic groups were determined from healthy patients with non-oncologic pathology. Whole-exome sequencing was then performed on DNA from tumor and adjacent benign parenchyma. **Results:** Healthy Blacks have a significantly greater PMI than case-matched Whites (0.90 vs. 0.70, $p < 0.005$). Blacks and Whites with PDAC have a similar average pre-operative PMI (0.67 vs. 0.61, $p = 0.3$). However, when comparing pre-operative PMI to the baseline control PMI for the two racial groups, Blacks have a significantly greater percent decrease than Whites (29% vs. 14%, $p < 0.05$). By whole-exome sequencing, 22 new somatic mutations were identified in Black tumor samples compared to 7 new mutations in Whites. Among mutations exclusively present Blacks, ABCF1 and ANAPC1 were reported to be associated with chemoresponse and survival in colorectal and lung adenocarcinomas, respectively. Cytochrome p450 family member CYP2A7 mutations were associated with peritoneal metastasis. PHACTR4 mutations were associated with Stat3 signaling activation and IL-6 mediated phosphorylation in hepatocellular carcinoma. Lastly, Hispanic/Latino patients, while not part of our tumor molecular sequencing, more frequently sought surgical intervention for pre-malignant cystic pancreatic neoplasms when compared to Whites (28% vs. 7%, $p < 0.05$). **Conclusion:** Novel mutations and a strongly cachectic phenotype characterize Blacks with PDAC and may drive a particularly poor prognosis. While more research might define a molecular rationale for the better clinical outcomes in Latinos, Hispanic/Latino patients most frequently seek care for pre-malignant lesions. We

conclude that recognizing the biological basis of cancer health disparities is essential for forming appropriate clinical decisions and defining specific therapeutic targets in ethnically diverse patients with PDAC.

D107, PR15 Intratumoral heterogeneity in Latino gastric adenocarcinomas.

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The goal of this study was to examine gastric (stomach) cancer mutational intratumoral heterogeneity (ITH) in Latinos using multi-region sequencing (MSEQ). Gastric cancer is the 2nd leading cause of cancer-related death worldwide. It is diagnosed in 25,000 Americans each year, with Latinos twice as likely to succumb as Whites. Treatment is currently limited to a few molecularly-guided therapies but TCGA data shows that 70% of GC patients have a mutation in a gene targetable with existing drugs. Significant ITH has been identified in a variety of tumor types to date, although a GC study has yet to be published. ITH is an important consideration for personalized therapy. Driver gene mutations are frequently found to be non-clonal, a crucial factor when assessing effective druggability. In this study, two to five tumor biopsies and adjacent normal tissue were obtained from 33 Latino patients, totaling 120 tumor (T) biopsies and 33 normal (N) samples. DNA was extracted from the tissues and the coding regions of 762 cancer-related genes were sequenced using Agilent target enrichment and Illumina sequencing. For each biopsy, estimates were made of sample purity and ploidy, somatic mutations were called using joint analysis of all T and N sequence data for each patient, cancer cell fraction (CCF) was estimated for each mutation, and copy number variation (CNV) was called across the genome. Somatic mutations and copy number changes were analyzed for clonality in each patient. We found a high degree of heterogeneity, both intratumoral and interpatient, with the fraction of functional somatic mutations that are clonal ranging from 0 to 68%, the fraction private to one biopsy ranging from 32% to 100%, and the fraction shared between multiple but not all biopsies ranging from 0 to 42%. For 10 of the 33 samples there was at least one gene, containing a clonal functional mutation, for which there is an FDA-approved targeted therapy. In summary, our study is the first to assess ITH in GC. Our results are important to understand the genetic diversity and

clonal architecture of these tumors and to improve molecular diagnostics.

D108 Developing precision medicine approaches to

address liver cancer disparities. Yvonne N Flores, Beth A Glenn, Folasade May, Lina Tieu, Carrie R Wong, Lucia Chen, Francisco Durazo, Roshan Bastani. UCLA, Los Angeles, CA, USA.

Background: Although overall cancer incidence and mortality have been declining in the United States (US) in recent years, liver cancer incidence and mortality have tripled since 1980. In 2019, an estimated 42,000 new cases of liver cancer will be diagnosed and there will be nearly 32,000 deaths from liver cancer. Hepatocellular carcinoma (HCC) is the most common form of primary liver cancer, and it generally progresses from chronic liver disease, such as cirrhosis. HCC and its etiologies are not evenly distributed in the population, with racial/ethnic minorities bearing a disproportionate burden of disease. Asians and Latinos currently have the highest incidence rates of HCC in the US. To investigate these disparities, we identified a sample of HCC patients at a large academic health system to compare their sociodemographic characteristics and clinical and behavioral risk factors by race/ethnicity. Methods: We used electronic health record (EHR) data to identify a cohort of primary care patients who had at least two outpatient visits to a UCLA primary care provider, at least one year apart, from 2006 to 2018, and who were between the ages of 18-75 years at the time of the visits (n = 280,619). Initial descriptive analyses were conducted to profile HCC cases by key demographics, including age, sex, and race/ethnicity, as well as by co-diagnoses, which may represent key contributing causes to the development of HCC. Results: In the primary care cohort, a total of 749 patients (0.002%) had a diagnosis of HCC. Prevalence of HCC was highest among Asians (0.6%), followed by African Americans (0.4%), Latinos (0.4%), and was lowest among Whites (0.2%). Among patients classified as other or unknown race the HCC prevalence was 0.15%, and 0.04%, respectively. The most common co-diagnoses among the HCC cases were: cirrhosis (58.9%), hepatitis C (HCV; 45.9%), hepatitis B (HBV; 26.3%), non-alcoholic fatty liver disease (NAFLD; 24.0%), non-alcoholic steatohepatitis (NASH; 23.0%), and alcoholic hepatitis (19.1%). Cirrhosis was the most common co-diagnosis for all racial/ethnic groups (Blacks=66.1%, Latinos=82.2%, Whites=54.8%), except Asians (49.1%). HBV was the most common co-diagnosis among Asians (62.9%), while HCV was the second most common co-diagnosis among Blacks (64.5%), Latinos (54.2%), and Whites (44.1%). Latinos were the most likely to have a co-diagnosis

of alcoholic hepatitis (37.3%). Conclusion: We observed distinct patterns of co-diagnoses with precursor conditions by race/ethnicity in this sample of HCC cases. Although the cross-sectional nature of these analyses preclude attributing cause to co-diagnoses, these results are consistent with existing epidemiological data. Future longitudinal analyses will examine the timeline between diagnosis with HCC and the respective etiologies, and investigate factors that may facilitate or impede disease progression, which can inform future interventions to reduce racial/ethnic disparities in liver cancer.

D109 *Helicobacter pylori* infections in Navajo communities

of Northern Arizona. Robin B Harris¹, Rachel Begay², Priscilla R Sanderson³, Carmenlita Chief³, Fernando Monroy³, Heidi E Brown⁴, Eyal Oren⁵. ¹University of Arizona Cancer Center, Tucson, AZ, USA, ²University of Arizona College of Public Health, Tucson, AZ, USA, ³Northern Arizona University, Flagstaff, AZ, USA, ⁴University of Arizona College of Public Health, Tucson, AZ, USA, ⁵San Diego State University College of Public Health, San Diego, CA, USA.

Background: *Helicobacter pylori* (*Hp*) is a gastric pathogen associated with development of duodenal or stomach ulcers, stomach cancer, and mucosa associated lymphoid-tissue (MALT) lymphomas. While *Hp* prevalence is declining in many regions, it remains the leading infectious cause of cancer worldwide. In the United States prevalence varies by geographic location, ethnic background, socioeconomic status, and age. This pilot project seeks to understand the role of *Hp* infection in the development of stomach cancer among Native Americans of Northern Arizona, where stomach cancer incidence rates are approximately three times higher than the general Arizona population and it is the leading cause of cancer mortality. Methods: A cross-sectional survey based on a random sample of households selected using census block vectors for tribal lands overlaid onto satellite imagery. Potential household structures were marked and randomly sorted with recruitment goals set to be proportional to underlying population size. Houses were 'ground-truthed' for eligibility and residents approached for participation. A total of 72 households were recruited between June-August 2018 with 105 self-identified Navajo >18 years old living in three communities in northern Arizona participating. Participants were assessed on household and individual level factors associated with infection. A urea breath test (UBT) was performed to test for active infection. We used logistic regression, adjusted for household clustering, to calculate odds ratios (aOR) and 95% confidence intervals (CI) for associations between UBT results and

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individual and household factors. Results: Active Hp infection was found in 66 of the 101 participants with valid UBT, crude prevalence of 65.4%. Male participants were more likely to be positive (aOR=2.89, 95% CI, 1.03-8.09). Participants with an unregulated household water source had the highest odds for positive UBT (aOR=8.85, 95% CI, 1.50-53.38). There was no association with age or education and a modest association with history of gallbladder disease. Only 23.8% reported they had ever heard of Hp infections and 12.9% previously tested for the infection. Conclusion: Prevalence of Hp is high among individuals in these Navajo communities. Use of household water that was not regulated, was strongly associated with active Hp infection. Further work is needed to determine if there is geographic variation and what Hp substrains are involved for this population. Attention also needs to focus on developing strategies to reduce the infection and target earlier detection.

D110 Same patient, different tumor. Does heterogeneity of pancreatic cancer matter? Differences in growth rates of patient-derived xenografts from individual patients. [Michael](#)

[U. Maduka](#), Patrick W Underwood, Andrea N Riner, Miles E Cameron, Jose G Trevino. University of Florida College of Medicine, Gainesville, FL, USA.

Abstract Background Pancreatic cancer (PC) is one of the leading causes of cancer mortality and soon to be the second-leading cause of cancer death in the US by 2030. Patient derived xenografts (PDX) represent an opportunity to better understand the biology driving higher incidence and mortality. Racial disparities exist and Blacks have worse clinical outcomes than any other race. We hypothesize that the PDX tumors from the same patient will grow at differing rates including PDX development from patients of different races/ethnicities. Methods Under an IRB approved protocol, patients with the diagnosis of pancreatic adenocarcinoma (PDAC) were recruited for tissue donation. After surgical harvest of PC specimen, patient-derived xenograft (PDX) models were derived in NOD.Cg-Prkdcscid Il2rgtm1Wjl/SzJ (NSG) mice. After initial passage from operation room, tumors from each individual patient were allowed to grow and subsequently divided and passed into 5 NSG mice and tumor growth rates were assessed by digital caliper. Patient race/ethnicity were de-identified as G and number of passages (p) from initial implantation were considered. Growth was assessed from 41 to 56 days. Coefficient of variation was attained and demonstrated the variability in growth values within each graft. Results PDX grafts (GXpX) were measured from 41 to 56 days. G1p5 and G2p1 were from non-Hispanic White patients and G3p3 was from a

Black patient with PDAC. G1p5 grew an average of 0.25 mm per day and tumor size at 55 days after implantation were 1.0 cm, 1.4 cm, and 1.7 cm with a coefficient of variation of 20.98%. G2p1 grew an average of 0.17 mm per day and tumor sizes at 56 days were 0.7 cm and 1.3 cm with a coefficient of variation of 42.42%. G3p3 grew an average of 0.16 mm per day and tumor size at 41 days were 1.3 cm, 1.3 cm, and 0.7 cm with a coefficient of variation of 31.49%. The growth rate of mice implanted with patient tumor G2p1 demonstrated more growth variation than G3p3 and G1p5. Conclusion PDX from the same patient and different races exhibit differing growth rates over time. Each PDX should be considered as a unique tumor given its gross heterogeneity and possible genetic drift within the same tumor. Recommendations for PDX model use should include tumor measurements of each individual xenograft throughout time intervals throughout experiments especially when considering therapeutics. These important observations will leverage our understanding of much needed preclinical tumor models in PDAC and help improve our understanding of the biology of racial disparities in pancreatic cancer.

D111 Incidence and survival patterns of gastroenteropancreatic neuroendocrine neoplasms in California. [Alan Paciorek](#), Brandon Shih, Meg McKinley, Iona

Cheng, Li Zhang, Claire Mulvey, Ann Griffin, Eric Nakakura, Quan-Yang Duh, Insoo Suh, Katherine Van Loon, Emily Bergsland. UCSF, San Francisco, CA, USA.

Background. Neuroendocrine neoplasms (NEN) are a heterogeneous group of rare tumors. There is a paucity of epidemiologic data regarding risk factors. We aimed to characterize the burden of NEN in California with its diverse racial/ethnic populations. Methods Using California Cancer Registry, we identified all newly diagnosed NEN from gastroenteropancreatic (GEP) sites 1992-2015. Annual age-adjusted incidence rates (AIR) per 100,000 person-years were compared, and average annual percent change (APC) in rates were compared according to sex, race-ethnicity (non-Hispanic (NH) white, NH black, Asian/Pacific Islander, American Indian, Hispanic), primary tumor site (stomach, small intestine, colon or rectum, appendix, pancreas), stage, and type of county of residence (urban, suburban, rural) using incidence rate ratios (IRR). Overall survival from diagnosis to death by any cause was estimated by Kaplan-Meier method and compared using log-rank tests. Results There were 23,983 GEP NEN incident cases and 9,910 deaths 1992-2015. All AIRs increased over the 24 years, with the greatest increase in Hispanics with pancreatic NEN (APC 8.9). Rates for the period 2011-2015 varied according to primary

tumor site: colorectal (AIR 1.41); small intestinal (AIR 0.97); pancreatic (AIR 0.92); stomach (AIR 0.44); and appendiceal (AIR 0.36). Comparing rates by populations the greatest disparities were for NH blacks vs. Asians with small intestinal NEN (IRR 7.01 95% confidence interval (CI) [5.37-9.21]) or appendiceal NEN (IRR 3.74 95% CI [2.34-6.08]), for NH whites vs. Asians with small intestinal NEN (IRR 4.34 95% CI [3.44-5.53]) or appendiceal NEN (IRR 5.10 95% CI [3.54-7.59]), for NH blacks vs. NH whites with colorectal NEN (IRR 2.59 95% CI [2.27-2.94]), and for NH whites vs. Hispanics with appendiceal NEN (IRR 2.54 95% CI [2.08-3.12]). Statistically significantly longer survival estimates were observed in women (median 13.1 years) vs. men (11.6 years), and in Asians/Pacific Islanders (20.7 years) and Hispanics (16.7 years) vs. NH blacks (12.3 years) and NH whites (9.6 years). No significant survival differences were detected across county types. Survival estimates were significantly different across primary tumor sites: colorectal (median 19.9 years); appendiceal (16.0 years); small intestinal (10.1 years); stomach (9.7 years); and pancreatic (4.4 years). Conclusions Incidence rates of GEP NEN in California steadily increase from 1992 through 2015 for all populations. Recent AIRs for particular race-ethnicities and primary tumor sites are more than double others, exposing large disparities. Survival estimates differ significantly by primary tumor site, sex, race-ethnicity, and stage, but not by county. These findings show some higher incidence rates and longer survival than in previously published estimates nationwide and add information about GEP NEN in Hispanic and Asian/Pacific Islander populations in California. Additional research is needed to clarify reasons for the disparities.

D112 Development of an organoid assay for studying racial disparity in pancreatic acinar ductal metaplasia. Julie Bray, Sihem Ait-Oudhia, Martha Campbell-Thompson, [Thomas D. Schmittgen](#). University of Florida, Gainesville, FL, USA.

Blacks have a higher rate of incidence and mortality of pancreatic cancer compared to whites. In an effort to identify a biological basis for this disparity, we propose examining the early events in the development of pancreatic cancer. The process by which pancreatic acini transdifferentiate into ductal epithelial cells (i.e. acinar ductal metaplasia or ADM) is one of the earliest events in the development of pancreatic ductal adenocarcinoma. We adapted the classic in vitro ADM assay, by which primary mouse pancreatic acini undergo ADM once plated onto the extracellular matrix matrigel, to an assay to culture and transdifferentiate human pancreatic organoids. Human pancreatic acini was received from black (n=5), white (n=3) and Hispanic (n=6) donors

from pancreatic islet transplantation centers. The gender distribution was 8 males and 6 females. The acinar cells were cultured on matrigel and allowed to undergo ADM over a 5 to 6 day period. The number of ductal epithelial cells were microscopically counted and the rate of transdifferentiation was determined. Using this technique, we successfully cultured and transdifferentiated 14 of 14 human pancreatic acinar cells. Preliminary data from our study suggests that females undergo ADM at a greater rate than males. Data on race was inconclusive due to the low number of samples. In summary, we have developed an assay to culture and study pancreatic ADM using human specimens. Future studies using increased sample size will investigate if racial disparity exists for pancreatic ADM.

D113 Socioeconomic disparities underlie outcomes in patients with pancreatic neuroendocrine tumors. [Patrick W. Underwood](#)¹, Andrea N Riner¹, Michael U Maduka¹, Sushanth Reddy², J. Bart Rose², Jose G Trevino¹. ¹University of Florida College of Medicine, Gainesville, FL, USA, ²University of Alabama at Birmingham School of Medicine, Birmingham, AL, USA.

Background Disparities are known to underlie outcomes in pancreatic ductal adenocarcinoma (PDAC). Pancreatic neuroendocrine tumors (PNET) represent a rare yet deadly form of pancreatic cancer. Health disparities have not been well described in this patient population. We hypothesize that given the significant health disparities in PDAC, cancer health disparities exist in patients with PNETs. Methods Patients treated for PNETs were identified in a National Cancer Database (NCDB) Patient User File for the years 2004-2015. Kaplan-Meier analysis was performed to assess survival. Cox proportional hazards models were used to assess the effect of clinical and socioeconomic factors on survival. Results Review of the NCDB found 19,752 reported cases of PNETs. Of those, 15,589 (78.9%) were non-Hispanic white (NHW), 2,462 (12.5%) were black (B), and 1,710 (8.6%) were Hispanic, white (H). On univariate analysis, greater age, male sex, higher Charlson comorbidity score, higher disease stage, lack of insurance, decreased median household income in area of residence, and no surgery were associated with worse survival (p< 0.05). While not statistically significant and unlike pancreatic adenocarcinoma, black patients had greater median survival (89.6 months; 95% CI 77.9-101.196) compared to NHW (76.4 months; 95% CI 72.9-79.8) and H (80.1 months; 95%CI 70.7-89.5) patients. On multivariate analysis, the same factors from the univariate analysis were associated with worsened survival (p< 0.05). Sub-analyses of patients who received surgery and those who did not again

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showed no significant difference in survival based on race. Conclusion While insurance status, median income in area of residence, and sex were associated with clinical outcomes in PNETs, race was not a contributing factor. This is in contrast to literature in PDAC which has demonstrated that black patients have worse survival. The reasons for this difference are unclear, but may be biologically driven. It is important to understand disparities from different types of pancreatic tumors. Further work to understand biologic contributions to health inequities are needed.

D114 Vitamin D signaling of immune-related genes in diverse prostate cancer cell lines. Madhavi Bathina¹, Leanne Woods-Burnham¹, Mya S Walker¹, K Sean Kimbro², Rick A Kittles¹. ¹City of Hope National Medical Center, Duarte, USA, ²Biomedical/Biotechnology Research Institute (BBRI), Durham, USA.

BACKGROUND: African American (AA) men are disproportionately affected by both prostate cancer (PCa) and vitamin D deficiency compared with European American (EA) men. Vitamin D deficiency is linked to increased PCa aggressiveness and mortality. Inflammation also plays an important role in PCa pathogenesis and progression, and expression of immune-related genes in PCa tissues differs significantly between AAs and EAs. While evidence linking vitamin D and immune response to PCa remains scarce, previous studies demonstrated that vitamin D has anti-inflammatory effects in prostate tissue and mediates immune-related gene expression. Therefore, we hypothesize that vitamin D deficiency in AA men may alter the expression of immune-related genes associated with prostatic inflammation and PCa progression. **METHODS:** This study examined the effects of vitamin D on the expression of vitamin D- and immune-related genes. We exposed a racially diverse panel of PCa cell lines—MDA-PCa-2b (AA), RC77T/E (AA), PC3 (EA), 22Rv1 (EA), and DU145 (EA)—to various concentrations (2.5 nM, 10 nM, 50 nM) of 25-hydroxyvitamin D (25(OH)D) and 1,25 dihydroxyvitamin D (1,25(OH)2D) for 24 hours, and quantified transcript levels and protein expression of VDR, RXRa, RXRb, LRP2, CYP27B1, GDF15, GFRAL, TNFa, IL6, IL8, and IGFBP3 with qPCR and immunoblotting. **RESULTS:** All cell lines expressed basal levels of VDR, RXRa, and RXRb confirming the function of vitamin D signaling within PCa cells. Of the downstream immune-related genes tested, we observed a trend demonstrating that vitamin D treatment induced the greatest upregulation in either transcript and/or protein levels among the AA PCa cell lines RC77T/E and/or MDA-PCa-2b. In particular, LRP2, GDF15, TNFa, IL6, IL8, and IGFBP3 significantly increased in

AA PCa cell lines exposed to either 25(OH)D or 1,25(OH)2D. **CONCLUSIONS:** These findings provide insight into a potential differential regulation of immune-related pathways by vitamin D in AA men compared to EA men with PCa. Further studies are warranted to better define the immune profile in prostatic tissue in response to vitamin D deficiency in AA men, and the downstream inflammatory effects on the microenvironment and tumor aggressiveness.

D115 The interplay between rurality-urbanicity and race in prostate cancer risk, treatment, and survival in the United States. Eboneé N Butler, Michael B Cook. National Cancer Institute, Bethesda, MD, 20852.

Background. In this study, we compared prostate cancer incidence and survival between rural and urban settings in the US, using a recently released census-tract rurality-urbanicity metric that serves as a proxy for geographical access to care. We also examined the associations between rurality and receipt of definitive treatment and further examined whether rural-urban status serves as an explanatory factor for observed race differences in prostate cancer incidence, treatment, and survival. **Methods.** Using data from the Surveillance, Epidemiology, and End Results program we identified prostate cancer patients newly diagnosed between 2000 and 2015, aged 45 years and older. Patients were classified as residing in a 'rural' or 'urban' setting based on the US Department of Agriculture's 2-level Rural Urban Commuting Area (RUCA) measure. We defined 'definitive treatment' as receipt of radical prostatectomy (RP) among patients diagnosed with locoregional disease. To compare rural and urban settings we estimated relative measures for prostate cancer incidence, odds of treatment receipt, and prostate cancer survival using Poisson, logistic, and Cox regression models, respectively. We adjusted regression models for age, race, stage, or treatment, where applicable. **Results.** Between 2000 and 2015, men in the rural US were slightly less likely to be diagnosed with prostate cancer when compared with urban US men (incidence rate ratio (IRR) = 0.89; 95% CI: 0.88, 0.90), but were at higher risk of prostate cancer death (hazard ratio (HR) = 1.16; 95% CI: 1.13, 1.19). Patients diagnosed with locoregional disease in rural settings were also less likely to receive RP compared with their urban counterparts (odds ratio (OR) = 0.91; 95% CI: 0.89, 0.92) and were more likely to receive non-radical surgical interventions (OR = 1.31; 95% CI: 1.28, 1.35). In general, race differences were not evident by rural-urban status. Black men, however, were more likely to receive a prostate cancer diagnosis irrespective of geographical setting when compared with white men (rural IRR = 1.50; 95% CI: 1.46, 1.54

and urban IRR = 1.69; 95% CI: 1.64, 1.73). Black men were also substantially less likely to receive RP (OR = 0.49; 95% CI: 0.48, 0.49). With respect to survival, Asian or Pacific Islander men were at lower risk of prostate cancer death compared with white men (HR = 0.78; 95% CI: 0.75, 0.81). By contrast, American Indian/Alaskan Native and black men had the highest risks of death (HR = 1.26; 95% CI: 1.11, 1.43 and HR = 1.25; 95% CI: 1.22, 1.28, respectively). Conclusions. Observed differences in prostate cancer incidence, treatment, and survival may reflect spatial differences in access to cancer prevention and cancer care. Rural-urban status does not appear to modify racial/ethnic differences in prostate cancer incidence and survival.

D116 Glucocorticoid receptor interacts with beta-catenin to promote stemness and therapy resistance in prostate cancer cells. Shannalee R Martinez, Evelyn S Sanchez-Hernandez, Xin Chen, Alfonso M Duran, Charles H Wang, [Carlos A Casiano](#). Loma Linda University, Loma Linda, CA, USA.

Prostate cancer (PCa) is the most commonly diagnosed male cancer, with men of African ancestry showing a disproportionately high incidence and mortality. There is increasing evidence that glucocorticoid signaling through glucocorticoid receptor (GR) is amplified in African American men due to cumulative life stress, and that GR signaling is a key driver of resistance to androgen-targeted therapy, radiotherapy, and taxane chemotherapy in advanced PCa. Recent studies indicate that GR also promotes in PCa cells the formation of tumorspheres, a property of cancer stem cells (CSC); however, the mechanisms remain unclear. CSCs are intrinsically resistant to therapies due to their low-frequency, expression of transporters and efflux pumps, quiescent cell cycle and metabolic profile. Our previous studies demonstrated that docetaxel (DTX)-resistant PCa cells exhibit increased capacity for CSC-like properties, suggesting that these properties contribute to chemoresistance. Like GR, beta-catenin is overexpressed in metastatic and therapy-resistant tumors, and is considered a key regulator of cancer stemness and androgen-targeted therapy resistance. Thus, we hypothesized that GR may interact with beta-catenin in PCa cells to support stemness and chemoresistance. Using whole-cell and nuclear co-immunoprecipitation, we demonstrated the interaction between GR and beta-catenin in several DTX-sensitive and -resistant PCa cell line pairs. Pharmacological inhibition of GR using the selective inhibitor CORT-108297 with concomitant inhibition of beta-catenin using the small molecule inhibitor MSAB significantly enhanced DTX cytotoxicity in resistant PCa cells grown in both adherent and spheroid cultures. The

BET bromodomain inhibitor JQ1, an antagonist of enhancer-mediated GR upregulation, also significantly reduced tumorsphere formation and stemness in DTX-resistant PCa cells. In order to gain insights into transcriptomic profiles activated by GR signaling that may contribute to stemness and therapy resistance, we performed RNA sequencing in a racially diverse panel of PCa cell lines (MDA-PCa-2b, VCaP, 22RV1, and PC3) treated with and without dexamethasone, a potent glucocorticoid. We observed that the African American cell line MDA-PCa-2b yielded the largest number of differentially regulated genes, perhaps due to the ability of dexamethasone to signal through both AR and GR in this particular cell line. RNAseq data is currently being mined and validated in cellular models treated with glucocorticoids or androgens, in the presence or absence of anti-GR or anti-androgen inhibitors, in order to identify GR-regulated genes. Our results offer novel insights into mechanisms by which GR signaling may influence tumorsphere formation and stemness, and suggest that combinatorial targeting of GR and beta-catenin could be a promising therapeutic strategy to overcome PCa therapy resistance and consequently reduce PCa mortality and its racial disparities.

D117 Differential reactivity and cell migration inhibitory functions of autoantibodies to Enolase 1 from African American and European American men with prostate cancer. Carlos Diaz-Osterman, Tino Sanchez, [Carlos A Casiano](#). Loma Linda University, Loma Linda, CA, USA.

Prostate cancer (PCa) is the second leading cause of cancer-related deaths in the U.S., with African American (AA) men showing a higher mortality than European American (EA) men. While biological determinants contributing to PCa health disparities remain to be clearly established, there is growing evidence of differences in immunobiology between AA and EA patients with PCa. We demonstrated previously, using immunoproteomic profiling of anti-tumor autoantibody responses in AA and EA patients with PCa, that the glycolytic enzyme enolase 1 (ENO1) is the target of an autoantibody response in subsets of these patients. AA patient sera showed immunoreactivity to ENO1 in a panel of PCa cell lines, as detected by immunoblotting, with lack of reactivity in docetaxel (DTX)-resistant PC3 and DU145 cells. By contrast, anti-ENO1 sera from EA patients and a monoclonal anti-ENO1 antibody (MoAB-ENO1) showed immunoreactivity across the same cell line panel, including DTX-resistant cells. We also noted differences in anti-ENO1 reactivity in ELISA and immunoblots of PCa cell lysates between AA-PCa and EA-PCa patients, suggesting a race-related generation of autoantibodies to different ENO1 variants. ENO1 is a surface

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protein in cancer cells with roles in plasminogen activation, cell migration, and metastasis. Thus, we explored if anti-ENO1 autoantibodies from AA and EA PCa patients exerted different anti-cancer effects against DTX-sensitive and DTX-resistant PCa cells. Using cell migration assays, we observed that anti-ENO1 sera from EA patients and MoAB-ENO1 reduced the migration of DTX-resistant PC3 and DU145 cells but not that of DTX-sensitive cells. This inhibitory effect was intrinsic to the autoantibodies since purified IgG fraction produced similar results. Further, these inhibitory effects were reversed by pre-absorption of anti-ENO1 sera and purified IgG with recombinant human ENO1. Intriguingly, anti-ENO1 sera from AA patients lacked the same inhibitory effects on the migration of DTX-resistant cells, consistent with their lack of immunoreactivity to ENO1 in these cells. In addition, we observed that MoAB-ENO1, which behaves similar to the anti-ENO1 EA sera, decreased viability without evident cell death, measured by MTT assays and imaging analysis, in both DTX-sensitive and DTX-resistant cells, with a more robust effect on the latter. Together, these results suggest that anti-ENO1 autoantibodies from EA-PCa patients may exert a protective effect by decreasing the migration and proliferation of chemoresistant PCa cells. By contrast, anti-ENO1 autoantibodies from AA PCa patients may lack these protective effects, which could contribute to increased cancer cell migration and metastasis. Further studies are needed to dissect the molecular basis for this race-related differential anti-ENO1 immunoreactivity in PCa patients, and exploit the immunotherapeutic potential of anti-ENO1 antibodies for the treatment of chemoresistant PCa.

D118 Insulin receptor splicing regulation as a potential target for improved prostate cancer disparity outcomes.

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Prostate Cancer is the third most commonly diagnosed cancer in the US, with 174,650 new cases predicted in 2019. Rates of incidence and mortality are 2 to 3 times higher among men from African American (AA) descent. These statistics necessitate unconventional and out-of-the box treatment approach to impede this cancer, specifically in AA men that are most likely to succumb to the cancer. Alternative splicing (AS) is a process in which a pre-mRNA can be processed into different mature mRNAs with the aid of the splice regulatory machinery. AS contributes to structural transcript variation and proteome diversity and is tightly regulated during development and differentiation.

It has been shown that deregulated splicing can give rise to protein isoforms that contribute to tumor initiation, progression and resistance to therapy. The insulin receptor gene (INSR) has uniquely evolved to undergo AS to produce two isoforms: the full-length INR-B and exon 11 skipped INR-A isoform. INR-B primarily mediates the metabolic effects of insulin, whereas INR-A triggers growth-promoting effects. This increased INR-A expression promotes the proliferation of the cells because it encodes for a receptor which has high affinity for both insulin and IGF2 growth hormones and it exploits the IGF pathway to accelerate the onset of tumor-cell hallmarks like proliferation and angiogenesis. Published work as well as preliminary data from our own lab suggest that there is a significantly increased expression of INR-A levels in prostate cancer. This atypical increased expression was further confirmed in multiple prostate cancer cell-lines. Our data further shows that this conversion of INR-B to INR-A takes place in the presence of stress conditions such as hypoxia. Furthermore, the INSR expression and splicing is particularly relevant in prostate cancer since Hif1a has been shown to be significantly elevated and associated with worse prognosis in prostate cancer. Hypoxic signaling has also been found to be a key driver of malignancy as well a reason for treatment failure. Strikingly, the INR-A isoform is expressed more often in prostate cancer samples from AA males than those from European descent (EA). Our goal is to understand the role of AS in cancer and to target the splicing pathway as a therapeutic intervention. To this end, we used a novel hypoxia-induced splicing system that recapitulates the IN-R splicing seen in tumors to identify splice regulatory proteins and their respective binding sites capable of regulating INSR splicing in prostate cancer. In collaboration with Ionis Pharmaceuticals we have shown that splice-switching oligonucleotides (SSOs) can target the splicing enhancer and repressor sequences we identified to interfere with INSR splicing and cancer cell behavior. We hypothesize that decreasing the expression of the A variant will lead to decreased tumor growth and increased susceptibility to current treatment regimens that will be particularly beneficial to AA men that express high levels of the INR-A isoform.

D119, PR16 Association of renal cell carcinoma subtypes with race/ethnicity and comorbid medical conditions.

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System and Stanford University School of Medicine, Palo Alto, CA, USA, ⁴Stanford University School of Medicine, Stanford, CA, USA.

Background: Renal cell carcinomas (RCC) comprise distinct subtypes that differ in molecular characteristics and prognosis. The distribution of these subtypes varies by race/ethnicity. Hypertension, obesity, chronic kidney disease, and diabetes have been associated with increased risk of RCC, and emerging evidence suggests that the risk may be subtype specific. We assessed whether race/ethnicity and comorbidities were independently associated with RCC subtypes. **Methods:** Using population-based data from the California Cancer Registry linked to the Office of Statewide Health Planning and Development, we identified non-Latino White, non-Latino Black, Latino, and Asian/ Pacific Islander adults diagnosed with their first microscopically confirmed RCC between 2005 and 2015. Diagnosis of hypertension, diabetes, and kidney disease was defined by ICD-9 and ICD-10 codes present prior to RCC diagnosis. We used multivariable logistic regression to model the association of the three main RCC subtypes (clear cell, papillary, and chromophobe) with race/ethnicity adjusting for comorbidity, sex, neighborhood socioeconomic status, age, and year of diagnosis. **Results:** Of the 40,016 cases of RCC included, 62.6% were clear cell, 10.9% papillary, and 6.0% chromophobe. There were striking differences in the proportion of clear cell and papillary subtypes by race/ethnicity, ranging from 40.4% clear cell and 30.4% papillary in non-Latino Black adults to 70.7% clear cell and 4.5% papillary in Latino adults. The prevalence of comorbid conditions also varied by race/ethnicity - most notably the greater prevalence of kidney disease in the non-Latino Black group. In multivariable analysis, non-Latino Black individuals had a higher likelihood of presenting with papillary (odds ratio (OR) 3.35, 95% confidence interval (CI) 3.05-3.68) and chromophobe (OR 1.23, 95% CI 1.06-1.44) subtype compared to those identified as non-Latino White. In contrast, both Latino and Asian/ Pacific Islander individuals were more likely than those of non-Latino White race/ethnicity to present with clear cell subtype (OR 1.48, 95% CI 1.41-1.56 and OR 1.30, 95% CI 1.20-1.40, respectively). Clear cell subtype was associated with diabetic renal disease (OR 1.39, 95% CI 1.23-1.58) and uncomplicated diabetes (OR 1.29, 95% CI 1.22-1.37), while papillary subtype was associated with hypertension (OR 1.22, 95% CI 1.13-1.32), hypertensive renal disease (OR 1.53, 95% CI 1.34-1.75), and end-stage renal disease (OR 1.55, 95% CI 1.31-1.84). **Conclusion:** In addition to race/ethnicity, specific comorbidities are associated with RCC subtype. The association of diabetes, hypertension, and end-stage renal disease with RCC subtype may provide clues to disease etiology as well as avenues for disease prevention.

D120 Similarities and differences between genomic profiles of prostate cancers from African American and European American men with implications for precision cancer medicine.

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Background: African American (AA) men have the highest mortality rate from prostate cancer compared to men from other races. Differences in the spectrum of somatic genomic alterations in tumors between AA men differs from non-AA men has not been well characterized as relatively few AA men have been included in prostate cancer genomic studies. To address this, we examined 5 publicly-available and commercial genomic datasets containing AA men with prostate cancer to identify novel alterations associated with race. **Methods:** In a meta-analysis of 4 public datasets, we investigated the mutational frequencies of 14 genes across 252 AA men and 635 non-AA men with primary prostate cancer. We also examined genomic alterations from the tumors of 436 AA men and 3018 EA men with primary or metastatic prostate cancer using the Foundation One assay. **Results:** We identified mutations in ZFH3 and focal deletions in ETV3 more frequently in tumors from AA patients. The mutational frequency of TP53 was strongly associated with increasing Gleason grade. Using the commercial assay, we identified alterations in PTEN and TMRSS2-ERG as less frequent in AA patients compared to non-AA patients in both primary and metastatic tumors. MYC amplifications were more frequent in AA patients with metastatic prostate cancer. Furthermore, we found that genomic alterations in KMT2D and CCND1 were more frequent in primary prostate tumors from AA patients, resulting in differential cell cycle genes and KMT alterations. MYC amplifications were more frequent in AA patients with metastatic prostate cancer. Genomic alterations in DNA repair genes were found at similar frequencies between EA and AA patients. **Conclusion:** While these results indicate that differences in mutational profiles may exist between racial groups in prostate cancers, additional sequencing studies that profile AA and EA men from the same clinical setting and that are matched for clinical covariates may be needed to confirm these findings. Overall, these results have implications for applying precision cancer medicine in AA prostate cancer patients.

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D121 Predicting African American and European American patient response to kidney cancer immunotherapy by stage using the tumor microenvironment. Jacquelyn Cobb¹, Heinrich Williams², [Khadijah A. Mitchell](#)¹. ¹Lafayette College, Easton, PA, USA, ²Geisinger Medical Center, Danville, PA, USA.

Background Kidney cancer ranks as a top ten leading site of new cancer cases (~64,000) in the US each year. Renal Cell Carcinoma (RCC) is the predominant type of kidney cancer (~90% cases). The most common RCC subtypes include clear cell RCC (ccRCC, 75%), papillary RCC types I and II (pRCC I and II, 5% and 10%), and chromophobe RCC (chRCC, 5%). RCC subtypes have distinct responses to immunotherapy. Combination checkpoint inhibitors are the first-line treatment for advanced stage ccRCC. Unfortunately, response varies in advanced stage patients, suggesting stage-specific differences in tumor biology. Tumor infiltrating lymphocytes (TILs) in the tumor microenvironment (TME) have been shown to directly influence checkpoint inhibitor response. African Americans (AAs) have higher RCC incidence rates than European Americans (EAs) for reasons that are unclear. Biological determinants of this cancer health disparity have been largely understudied. To our knowledge, no study to date has profiled the TME by stage in AA and EA RCC patients and explored its usefulness as a predictor of checkpoint inhibitor response. Hypothesis TIL abundances and composition varies by stage between AAs and EAs with RCC. Methods Downloaded mRNA-sequencing and clinical data for 531 ccRCC patients, 52 Type I pRCC patients, 66 Type II pRCC patients, and 66 chRCC patients in the TCGA discovery cohort. Differential expression analyses for checkpoint inhibitor drug targets (PD-1, PD-L1, and CTLA-4) were carried out. CIBERSORT, a computation tool that quantifies abundances for 22 TILs based on gene expression, was used to characterize the TME. 1-way ANOVAs between Stages I-IV were performed with GraphPad Prism 8. Significant racial differences for relevant TILs were determined using two-tailed unpaired Welch t tests. Kidney cancer immunotherapy drug responses were inferred based on published clinical studies. Results PD-1 and CTLA-4 significantly increased in advanced stage ccRCC patients. 6/22 TILs showed stage-specific increases and decreases in ccRCC patients. Interestingly, three of these (follicular helper T cells, regulatory T cells, and CD8+ T cells) showed the same trend as the checkpoint inhibitor targets. In pRCC I and II, some TILs also demonstrated a linear increase by stage (Both: regulatory T cells, M1 macrophages; Type II only: naive B cells). M2 macrophage abundance increased significantly by stage in chRCC patients. When comparing AA (n=55) and EA (n=461) ccRCC patients, follicular helper T cells and regulatory T cells increased by stage in EA only. CD8+ T cells

increased in abundance in both racial groups. Regulatory T cells and M2 macrophages have been reported to mediate clinical response to checkpoint inhibitor immunotherapy. Conclusions/Future Directions Our data suggests AA and EA RCC patients with advanced stage disease will respond differently to kidney cancer immunotherapy due to TME differences, namely TIL abundance and composition. Future studies include validating these findings in the expO cohort.

D122 Malaria and prostate cancer in Africa: Re-examining the evidence. [Solomon O Rotimi](#). Covenant University, Ota, Ogun, Nigeria.

Prostate cancer is the leading male malignancy in Africa, whose incidence and mortality are projected to continue to rise and being of African origin continues to be a non-modifiable risk factor. Malaria, on the other hand, is an inflammatory ancient infectious disease that is still endemic on the continent. While this infectious disease is highly deadly in children, the health impact of its chronic asymptomatic stage in adult remains largely unclear. This apparently-healthy status is partly driven by evolutionary malaria-adaptive genetic variants that are enriched in the genome of African populations. However, the roles of malaria and the malaria adaptation alleles in prostate tumorigenesis, also, still remain conflicting, particularly in Africa, where co-morbidity exists. This paper, therefore, reexamined the genomic data on prostate cancer from Africa for evidence of the malaria-adaptive genetic variants that are risk alleles for prostate cancer. This included data from prostate cancer genome-wide association studies on populations in different Africa regions. These populations are genetically heterogeneous and each has its unique prostate cancer risk alleles. Interestingly, we identified risk alleles of the West African population including malaria adaptation are genes like GATA3, CSMD1, HLA-DQB1, GTSF1L, GPR111, and DAB1. This paper further discussed the contribution of malaria to genomic instability and inflammation in prostate cancer, and its impact on the disparity in clinical outcomes for African men who continue to bear the burden of the comorbidity of these diseases. The understanding of the exact impact of malaria infection and adaptation among African populations is critical to reducing the burden of prostate cancer and improving its clinical outcomes.

D123 The intersection of race and delivery of guideline-based: How treatment disparities drive racial disparities in muscle-invasive bladder cancer. Sikai Song, Maxwell V Meng, Anne M Suskind, Sima P Porten, [Samuel L Washington III](#), Steven Gregorich. University of California San Francisco, San Francisco, CA, USA.

Objective For patients with muscle-invasive bladder cancer, studies have shown black race is associated with 21% lower odds of guideline-based treatment (GBT) and differences in treatment explain 35% of observed black-white differences in survival. We aim to understand how the interaction between race/ethnicity and receipt of GBT drive within-race and between-race differences in survival for black, white, and latino patients with muscle-invasive bladder cancer. **Methods** Using the National Cancer Database, we identified individuals diagnosed with cT2-4 muscle invasive bladder cancer (MIBC) from 2004-2013. Cox regression models included random effects to accommodate intra-facility correlations of outcome response. Models were adjusted for race, age at diagnosis, gender, histology, clinical T and N stages, treatment (GBT vs nonGBT), Charlson comorbidity index, insurance, and facility type with inclusion of the GBT-by-race interaction effect. Hazard ratios (HR) and 95% confidence intervals (CI) were reported. P value of 0.05 was considered statistically significant. **Results** Of the 60,566 individuals identified, 90.1% were white, 6.9% black, and 3% latino. Most were 60 years or older (84.6%), had cT2 disease (76.4%), cNo/x (92.9%) and had urothelial carcinoma (88.6%). Nearly one-third were female (28.3%). Most were treated at an academic center (34.9%) or comprehensive cancer center (46.3%). Half (50.2%) received GBT. On MV models clustered by treatment facility, GBT was associated with increased survival (HR 0.76, 95% CI 0.72-0.80) compared to nonGBT when averaged across all race groups. GBT benefit was similar for black and white individuals (black, HR 0.71, 95% CI 0.65-0.77; white, HR 0.72, 95% CI 0.70-0.74) but latino individuals experienced less benefit (HR 0.85, 95% CI 0.74-0.97) compared to nonGBT. From the GBT-by-race interaction, the GBT effect was near equivalent for black race (HR 0.97, 95% CI 0.90-1.07) compared to white counterparts but stronger for both when compared to latino individuals (black, HR 0.83, 95% CI 0.71-0.97; white, HR 0.85, 95% CI 0.74-0.97). Black individuals who received GBT had worse survival compared to white (HR 1.12, 95% CI 1.05-1.20) and latino counterparts (HR 1.14, 95% CI 1.01-1.29). Of those with nonGBT, white (HR 1.20, 95% CI 1.09-1.32) and black individuals (HR 1.38, 95% CI 1.24-1.53) had worse survival compared to latino individuals. Lastly, mortality risk of black individuals with GBT was near equivalent to latino patients receiving nonGBT (HR 0.97, 95% CI 0.87-1.09). **Conclusions** The GBT effect was not uniform,

with a 28-29% reduction in mortality risk experienced by white and black individuals but 15% reduction for latino counterparts. Our study illustrates how race-based treatment disparities influence survival outcomes and extend beyond black-white comparisons. Future efforts to improve the delivery of GBT, a factor directly impacted by urologic can providers, may mitigate the race-based survival differences observed in individuals with MIBC.

D124 Racial differences in adverse pathology among men with prostate cancer at time of radical prostatectomy. Sikai Song, Janet Cowan, Shoujun Zhao, Matthew R Cooperberg, Peter R Carroll, [Samuel L Washington](#). University of California San Francisco, San Francisco, CA, USA.

Objective: For black men, the concern that they are at greater risk of worse oncologic outcomes for prostate cancer compared to white counterparts may drive the greater push to surgery although reasons are likely multifactorial. While adverse pathology is associated with worse survival, data surrounding race-based differences in rates of adverse pathology is limited. We aim to examine the association between race and adverse pathology on surgical pathology among black and white men with prostate cancer. **Methods:** Using our institutional prospective oncologic database, we identified 3,826 patients diagnosed with prostate cancer since 1990 and underwent primary RP. Adverse pathology was defined as GS \geq 4+3 or pT3/4 or pN1 on surgical pathology. Race was dichotomized as black or non-Hispanic white. Multivariable logistic regression modeling was utilized to examine the association between race and AP after adjusting for age, year of diagnosis, and clinical risk by UCSF-CAPRA category (low 0-2, intermediate 3-5, or high 6-10). PIRADS and GPS scores were not included in the regression models due to the limited sample size. There was no significant effect of interaction between race and CAPRA, therefore no interaction term was included in the regression analysis. **Results:** Of 3826 patients included, 3682 (96%) were white and 144 (4%) were black. At diagnosis, mean age was 60.4 years (SD 7.1), median PSA density was 0.19 (IQR 0.13-0.20), and most were intermediate- (44%) or high-risk (15%) by CAPRA. Mean GPS scores was 26.85 (SD 12). The majority of those who underwent prostate MRI had PIRADS 4-5 lesions (89% vs 7% PIRADS 3, 4% PIRADS 1-2). Most had a systematic ultrasound-guided prostate biopsy alone (98%, 1% TRUS targeted alone, 1% MRI-TRUS fusion biopsy). Compared to white counterparts, black men were younger (53% <60 years vs 43%, p=0.02) with higher PSA density (PSAD 0.25 vs PSAD 0.19, p<0.01), and a larger proportion was high-risk by CAPRA (24% vs 15%, p=0.03) at diagnosis. PI-RADS at

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diagnosis, Genomic Prostate Score at diagnosis, and rate of targeted biopsy at did not differ significantly by race. Post-RP, pathologic Gleason grade, T-stage, and positive surgical margins rates were similar between races ($p>0.05$ for all). Nodal disease was more common in black men compared to white counterparts (8% vs 5%, $p<0.01$) On multivariate analysis, black race was not associated with higher risk of AP (OR 1.04, 95% CI 0.67-1.61, $p=0.86$) after adjusting for age, clinical CAPRA score, and year of diagnosis. Conclusions: Black race was not associated with increased risk of AP at RP compared to white counterparts after adjusting for clinical factors. While race-based differences in oncologic outcomes exist, this study supports the growing body of research challenging the prior attribution of these differences solely on biology. Further investigation into how multiple factors such as biology/genetics, quality of care, social environment, and health-related behaviors may interact to contribute to these observations is warranted.

D125 Disparities in cervical cancer mortality across the Siberian related ethnic regions: The Republic of Sakha, the Republic of Khakassia, Buryatia, the Altai Republic, and Tuva (2007-2017). Irina V. Kononova¹, Sargylana N. Mamaeva², Maria P. Kirillina¹, Petr V. Nikiforov¹. ¹Yakut Science Centre of Complex Medical Problems, Yakutsk, the Republic of Sakha, Russia, ²North-Eastern Federal University in Yakutsk, Yakutsk, the Republic of Sakha, Russia.

Introduction. Cervical cancer mortality (CCM) varies throughout Russia, including Siberia. Nevertheless, disparities in CCM of Siberian native ethnic population have not yet been investigated. The objective of this study was to determine the differences of CCM during 2007-2017 in Siberian regions, where gene related ethnic groups live – the Republic of Sakha (Sakha), Buryatia, the Republic of Khakassia (Khakassia), the Altai Republic (Altai) and Tuva. Four out of these five regions, except for Sakha, geographically located in the south of Siberia. Sakha is located in the northern part of Siberia.

Methods. Annual mortality rates from cervical cancer were analyzed from 2007 to 2017. This data was obtained from the annual reports entitled “Malignant neoplasms in Russia (incidence and mortality)” of P. Herten Moscow Oncology Research Institute - branch of the National Medical Research Radiological Center of the Ministry of Health of the Russian Federation. Age-adjusted mortality rates (per 100,000 populations) were compared for each region - Sakha, Buryatia, Khakassia, Altai and Tuva. Kruskal-Wallis H-test was used to determine the statistically significant differences in CCM variances of three or more regions and Mann-Whitney U test for two regions. T-test was used to determine the

statistically significant differences in paired CCM rates. Differences with a probability less than the significance level of 0.05 were considered as a statistically significant. Results. Comparisons showed CCM heterogeneity between all five regions of Siberia. The highest CCM rates from 2007 to 2017 were found in Buryatia - the average value of CCM rates (avCCM) is 11.46. CCM rates in this region from 2007 to 2017 were significantly higher than in all other regions, except for the Tuva. The lowest mortality rates during the observed timeframe were detected in Sakha, avCCM - 5.82. Mortality rates in Sakha during this timeframe were significantly lower compared to the other four regions. CCM rates comparison of Altai (avCCM - 9.85), Tuva (avCCM - 9.62) and Khakassia (avCCM - 7.76) did not reveal the significance of the differences between these three regions (although was close to significance). But when paired comparison of CCM variances was used, the CCM rates in Tuva were significantly higher than in Khakassia. When all regions' CCM rates in 2007 to 2017 were compared, then no significant changes of four regions, except for Altai, were found. In the Altai, compared to 2007, the mortality rate in 2017 significantly decreased, about 2 times (7.61 vs. 15.97). Conclusion. Despite the genetic relationships of the native ethnic populations of Siberia, CCM in the analyzed regions between 2007 and 2017 differs. The highest CCM were observed in Buryatia. The lowest mortality rates were detected in Sakha. CCM rates for the Altai, Tuva and Khakassia were not significantly different. CCM in the Altai in 2007 compared to 2017 decreased twice. The same comparison in Sakha, Khakassia, Buryatia and Tuva showed no changes.

D126 Racial disparities among patients with carcinoma of the cervix. Toms Vengaloor Thomas, Eldrin Bhanat, Shivanthidevi Gandhi, Teessa Perekattu Kuruvilla, Anu Abraham, Mildred Ridgway, Satyaseelan Packianathan, Srinivasan Vijayakumar. University of Mississippi Medical Center, Jackson, MS, USA.

Introduction: The purpose of this study was to evaluate the racial disparities among patients with carcinoma of cervix treated at a tertiary care institution. Methods: An IRB-approved and HIPPA-compliant retrospective analysis of patients with carcinoma of cervix was performed. All patients were treated in the department of Radiation Oncology at our institution between 2010 and 2018. Data regarding demographics, stage, treatment administered, and follow up were collected. Patient outcomes including median survival and overall survival were evaluated using the Kaplan Meier method. All analyses were performed using SPSS v. 24. Results: One hundred sixty-five patients with carcinoma

of the cervix were treated between January 2010 and December 2018. We had significantly higher proportion of African American (AA) as compared to Caucasian Americans (CA) patients (59.4 % vs 36.4 %; $p=0.03$). There was a significant difference in stage at the time of presentation between African Americans and Caucasian Americans in that a higher number of CA patients presented with locally advanced disease, (FIGO Stages IB2 to IVA) as compared to AA (86.7 vs 78.6 %; $p=0.000$). Unfortunately, a higher number of African Americans presented with metastatic disease at diagnosis 13.3 % vs 8.3 % ($p=0.000$), as compared to Caucasian Americans. In regard to treatment, 157 (95.2 %) underwent definitive chemoradiotherapy while 3 (1.8 %) had definitive surgery, followed by adjuvant radiation or chemoradiation depending on the risk factors. The treatment details of 5 patients were not available. The median follow up and the median survival of the entire cohort was 16 months and 79 months, respectively. In our cohort, there was no significant difference in overall survival between AA and CA patients at 3 years (80 % vs 68 %; $p=0.883$) or at 5 years (77 % vs 68 %; $p=0.883$). As expected, patients with locally advanced disease showed a significantly improved median survival of 79 months as compared to 11 months for those with metastatic disease at their presentation ($p=0.000$). Conclusions: Retrospective review of the patients with carcinoma of the cervix treated at our institution over the last 8 years revealed a significant racial disparity in that more AA women presented with metastatic disease. However, our analysis did not identify any racial disparity in the prognosis of the whole cohort.

D127 Is there a racial disparity in the prognosis of hypopharyngeal carcinoma? 25-year experience from a tertiary care medical center in the United States. Toms Vengaloor Thomas, Mary R Nittala, Teessa Perekattu Kuruvilla, Anu Abraham, Eldrin Bhanat, Satyaseelan Packianathan, Madhava Kanakamedala, Srinivasan Vijayakumar. University of Mississippi Medical Center, Jackson, MS, USA.

Introduction: The purpose of this study is to determine the likelihood of racial disparities between African American and Caucasian patients treated with hypopharyngeal carcinoma at a tertiary care institution over the last 25 years. Methods: HIPPA-compliant, IRB-approved retrospective analysis of patients with squamous cell carcinoma of the hypopharynx treated at our institution between January 1994 and December 2018 was performed. The data regarding the demographics, stage, treatment and follow up were collected. Outcomes including median survival and overall survival were evaluated using the Kaplan Meier method. All analyses were

performed using SPSS version 24. Results: We evaluated 144 hypopharyngeal carcinoma patients who were treated during the time period. Our patient cohort consisted of 61.8% African Americans and 35.4% Caucasians ($P= 0.538$). Overall, 96% of patients presented with advanced stage disease (stages III & IV), and only 4% of patients presented with early stage disease (Stages I & II). There was no significant difference between African American and Caucasians who presented with advanced disease (96.6 % vs 94.1%). Among our patient cohort, 15.3% of patients didn't receive any treatments, 51.4%, 22.9% and 10.4% of patients underwent definitive chemoradiotherapy, definitive surgery, and palliative chemotherapy respectively. There were no significant differences in each treatment group between the two races. The median follow up of the entire cohort was 13 months. There was no significant difference in the median survival of African American and Caucasian patients (16 months vs 15 months, $p=0.917$). In addition, there was no significant difference in the overall survival between African American and Caucasian patients at 3 years (27.2% vs 36.3%, $p=0.917$) or at 5 years (20.4% vs 16.7 %, $p= 0.917$). Conclusions: Retrospective review of the patients with hypopharyngeal cancer treated at our institution over the last 25 years did not reveal a significant racial disparity in regards to stage at presentation or prognosis. This study demonstrates that if patients have equal access to the care, they are likely to have similar prognosis despite racial differences. Further studies are warranted to validate this hypothesis. At the meantime, efforts should be focused on improving the access to medical care for the underserved population.

D128 Oropharyngeal cancer incidence-based mortality trends in the United States, 1985-2016. Nosayaba Osazuwa-Peters¹, Matthew C Simpson¹, Sean T Massa², Eric Adjei Boakye³, Kara M Christopher⁴, Sai D Challapalli⁵, Katherine M Polednik², Haley N Bray², Greg M Ward², Mark A Varvares⁶. ¹Saint Louis University School of Medicine, St. Louis, MO, USA, ²Washington University in St. Louis School of Medicine, St. Louis, MO, USA, ³Southern Illinois University School of Medicine, Springfield, IL, USA, ⁴Saint Louis University Cancer Center, St. Louis, MO, USA, ⁵University of Texas Health Science Center at Houston, McGovern Medical School, Houston, TX, USA, ⁶Harvard Medical School, Boston, MA, USA.

Objective: The last three decades in the United States have seen oropharyngeal cancer emerge as an important human papillomavirus (HPV)-associated cancer, with about three-quarters of cases thought to be positive for HPV. It has dramatically increased in incidence and recently surpassed

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cervical cancer as the leading HPV-associated cancer. While positive HPV tumor status generally portends better survival probability compared with non-HPV related head and neck cancer, there is a paucity of data describing mortality trends. This study aimed to describe trends in oropharyngeal cancer incidence-based mortality in the United States in the last three decades. Methods: We estimated age-adjusted incidence-based mortality rates (AAMR) from first primary oropharyngeal squamous cell carcinoma (OPSCC), using the Surveillance, Epidemiology, and End Results (SEER) 9 database from 1985-2016. To prevent later years from having a cumulatively larger set of patients diagnosed in the past, we only included OPSCC patients who died within 10 years of diagnosis. AAMRs were stratified by race, sex, and age at death and were presented per 100,000 person-years. Rate ratios (RRs) determined which groups had significantly different AAMRs, and Joinpoint regression calculated which groups had significant increases/decreases in annual AAMRs over time through annual percentage changes (APCs) and average APCs (AAPCs). We used 95% confidence intervals (CIs) to determine significant RRs, APCs, and AAPCs. Results: This study included 12,102 patients who died from first primary OPSCC from 1985-2016 with an AAMR of 1.16 per 100,000 person-years. AAMRs among males were 3.58 times higher than for females (RR = 3.58, 95% CI 3.43, 3.73). AAMRs among blacks were about 2 times higher than for whites (RR = 2.06, 95% CI 1.96, 2.16) but were about 60% lower for other race than whites (RR = 0.37, 95% CI 0.34, 0.42). From 1985-2009, AAMRs for first primary OPSCC decreased approximately 1.92% annually (APC = -1.92, 95% CI -2.27, -1.56) but remained stable from 2009-2016, which resulted in an average annual decrease of -1.31% from 1985-2016 (AAPC = -1.31, 95% CI -1.84, -0.78). When stratified by race or sex, all groups exhibited significant mortality rates decrease, however decrease was significantly greater among whites than blacks (white AAPC₁₉₈₅₋₂₀₁₆ = -0.76; 95% CI -1.33, -0.17 vs black AAPC₁₉₈₅₋₂₀₁₆ = -3.36; 95% CI -3.85, -2.87). AAMRs significantly decreased among 65+ year olds (AAPC = -0.88, 95% CI -1.63, -0.13), while AAMRs for 15-39 and 40-64-year olds exhibited non-significant decreases. Conclusions: While there has been significant decrease in oropharyngeal cancer mortality in the last three decades in the United States across age groups, races/ethnicity, and gender, there remained a significant mortality gap between blacks and whites, highlighting the persistent cancer-related disparity in the United States.

D129 The salivary proteome of African American and white American males diagnosed with laryngeal cancer. [Derek Wagner](#), Hannah Trew, Billy Ballard, Victor Paramov, Sid

Pratap, Dana Marshall. Meharry Medical College, Nashville, TN, USA.

Early detection of head and neck cancers (HNCa) correlate with improved outcomes. Salivary proteins may potentially be used for effective screening, which may result in increased survival time. This project aims to find potential biomarkers for laryngeal cancer, which ultimately could be detected by testing saliva or a swab of the back of the mouth. These simple screening methods would be of great benefit to high-risk individuals, and could potentially decrease disparities seen between minorities and white Americans. African American (AA) and white American (WA) men share similar incidences of laryngeal and tonsillar cancer, which affect men at a much higher rate than women. Among AA and WA men there is an alarming disparity, in which AA men are two to three times more likely to succumb to their disease. It is hypothesized that the salivary proteomes for tonsillar and laryngeal cancer, from AA and WA men, possess prognostic potential illustrating an association with the molecular characteristics of the tumor. MUDPIT proteomic analysis was done on four groups of pooled samples, four per group. Samples were collected with the approval of the Meharry Medical College Institutional Review Board. Inclusion criteria were males diagnosed with late stage (III or IV) laryngeal or tonsillar HNCa, active smokers, and HPV negative. Exclusion criteria were non-smokers and HPV positive. Groups were designated as AA/T, WA/T, AA/L and WA/L. A total number of 117 proteins were identified. AA/L had 111 proteins while WA/L had 116 proteins. Twenty proteins were detected from 1.6-fold to 1.62E+06 -fold greater in AA/L relative to WA/L. Eighty proteins were detected from 1.5-fold to 7.9E+07-fold greater in WA/L relative to AA/L. The resulting salivary proteomes were analyzed using WebGestalt. Pathway analysis for AA/L vs WA/L showed significant alignment with Reactome pathways. 8 proteins were found to be associated with innate immune function. There were no significant categories for enrichment category disease_Disgenet, however several proteins aligned with cancer categories at a non-significant level, such as annexin A1. Disease_GLAD4U recognized a statistically significant enrichment category of dental plaque. Represented proteins include CA6, PRH1 and MUC5B. Pathway analysis with KEGG, Panther and Reactome, were used for proteins greater in WA/L, and revealed overrepresentation of proteins associated with metabolic activity, hypoxia and the innate immune system. In addition, disease_disgenet showed proteins mapping to mouth neoplasms, SCC of esophagus, and cancer invasion. Finally, GLAD4U showed significance with periodontal diseases, ischemia and inflammation. A limitation of this research is the small sample size, nevertheless the potential differences

between racial groups promotes further investigation. Exploration of these specific proteins or protein signatures can give insight into varying physiological responses to disease and can be used to create a more personalized therapeutic approach.

D130 The importance of closing the gap in cancer disparities. [Kimberly Alexander](#). Independent Advocate, Frisco, TX, USA.

My poster will outline the current state of cancer/multiple myeloma disparities and why it is important to close the gap.

D131 Multiple myeloma in Puerto Rico. [Marisel Brignoni](#). dot4life, San Juan, PR, USA.

Multiple myeloma in Puerto Rico

D132 The association between insurance and lung cancer survival: The relative contributions of sociodemographic, tumor, treatment, and neighborhood factors. [Ying Liu](#), Min Lian, Graham Colditz. Washington University School of Medicine, St. Louis, MO, USA.

Health insurance is associated with lung cancer treatment and survival. It remains unclear to what extent insurance-associated survival disparities are attributed to prognostic factors of lung cancer. Using the Surveillance, Epidemiology, and End Results dataset, we identified 127,784 patients (age<65) diagnosed with lung cancer between 2007 and 2016. Cox proportional hazards regression was used to compute hazard ratios (HRs) of lung cancer-specific mortality. Relative contributions of prognostic factors to survival disparities were quantified by percent changes in HRs with sequential adjustment for marital status, socioeconomic deprivation, rurality, cancer stage, size, histology, surgery, radiation therapy, and chemotherapy. Difference in differences analysis was performed to examine the associations between Medicaid expansion and changes in proportions of no insurance and early-stage diagnosis, and 2-year survival rates. Compared with privately insured counterparts, the risk of cancer-specific mortality was significantly increased in uninsured men (HR=1.51, 95% CI 1.47-1.56; 5-year absolute risk difference (ARD)=12.5%, 95% CI 11.6%-13.3%) in uninsured men, Medicaid men (HR=1.36, 95% CI 1.33-1.39; 5-year ARD=9.6%, 95% CI 9.0%-10.3%), uninsured women (HR=1.66, 95% CI 1.59-1.72; 5-year ARD=17.0%, 95% CI 15.8%-18.2%), and Medicaid women (HR=1.41, 95% CI 1.38-1.45; 5-year ARD=12.0%, 95% CI 11.2%-12.9%) after

adjustment for age, race, and registries. Further adjustment for the aforementioned factors explained 63.7%-70.6% of survival disparities. Medicaid expansion was associated with a greater reduction in uninsured rates (2.0 percentage point (ppt), $p<.0001$), and a greater increase in the proportion of early-stage diagnosis (2.1 ppt, $p<0.01$) and 2-year survival (1.3 ppt, $p=0.04$) in men only, after adjustment for covariates. The study provided evidence for worse survival in uninsured and Medicaid lung cancer patients compared with privately insured counterparts, more than half of which were attributable to sociodemographic, tumor, treatment, and neighborhood factors. Medicaid expansion was associated with shift towards early-stage diagnosis and improvements in short-term survival in men with lung cancer.

D133 Development of a racially/ethnically diverse collection of immortalized lung epithelial cell lines to model lung adenocarcinoma development and drug resistance across population groups. Evelyn Tran, Tuo Shi, Xiuwen Li, Amy Firth, Beiyun Zhou, Zea Borok, [Ite A Offringa](#). University of Southern California, Los Angeles, CA, USA.

Introduction: The most common type of lung cancer is lung adenocarcinoma, arising in the alveolar epithelium (air sacs). Drugs that specifically target certain known driver mutations are available. Unfortunately, resistance usually develops, and the cancer returns. In some cases, second and even third line targeted therapies have been established. The availability of such therapies is dependent on being able to screen for drugs that can treat resistant cells and elucidating the molecular basis of resistance. Importantly, the susceptibility of cancer cells to different therapies may be affected by the genetic background and thus the race/ethnicity of the patient. In order to ensure that effective therapies are available for all population groups, we propose to develop a collection of immortalized alveolar epithelial cell lines that represent a diversity of racial/ethnic groups. These cell lines can be used to study driver mutations and development of drug resistance, and to screen for new therapies to combat resistance. Results: Human alveolar epithelial cells are difficult to immortalize; they become senescent or undergo epithelial to mesenchymal transition, turning into fibroblasts. By using Y27632 dihydrochloride, a highly potent ATP-competitive inhibitor of Rho- associated coiled-coil forming protein serine/threonine kinase pathway, in combination with a viral oncogene, we have developed a method to culture and immortalize alveolar epithelial cells from remnant human transplant lung. The cells maintain their epithelial phenotype and can form spheres expressing lung epithelial markers in three dimensional culture. We are now in the process of

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inserting known driver mutations into these cells through targeted genome editing using CRISPR/Cas9. We intend to derive 10 similar cell lines each, from white, Latino, black and Asian subjects. Future directions: We will introduce driver mutations into cell lines of different backgrounds and resulting cell lines will be treated with targeted therapies in vitro to derive resistant cells. The parental, mutated, and resistant cell lines will be characterized by exome/transcriptome sequencing, and copy number variation analysis to determine the consequences of driver mutations and the basis for acquired resistance. We will use high throughput screening to identify drugs that can target resistant cells, using USC's advanced drug screening facility, focusing on drugs that are approved by the Food and Drug Administration to ensure the greatest and fastest benefit to people suffering from lung cancer. Numerous existing drugs may have failed in trials due to differences between patients, and their therapeutic effect may be underestimated. Conclusion: Our ability to immortalize alveolar epithelial cells allows us to establish a large collection of alveolar epithelial cell lines that represent the diverse genetic background of the population of the United States. This will ensure that any developed therapies will be effective on a diversity of patients.

D134 Patterns of EGFR mutation testing among patients with metastatic lung cancer in a safety-net hospital. [Ana I Velazquez](#), Niharika Dixit. University of California, San Francisco, San Francisco, CA, USA.

Background: Lung cancer is the second most common cancer and the first leading cause of cancer death in the United States. *EGFR* mutations are the second most common oncogenic driver mutation which occur in up to 23% of advanced lung adenocarcinoma (LAC) cases. These are seen with increased frequency in women, never smokers, and those of Asian ethnicity, affecting up to 50% of Asian patients. Since 2011 NCCN guidelines have recommended *EGFR* testing for all patients with newly diagnosed metastatic LAC. Despite guideline recommendations, population-based studies have shown underutilization of guideline-recommended *EGFR* testing and identified racial, economic, and regional disparities in testing. We aimed to review adherence patterns with guideline-recommended *EGFR* testing at our city's only safety-net hospital. Methods: We performed a retrospective review of all patients diagnosed with metastatic LAC between 2011 and 2015 at Zuckerberg San Francisco General (ZSFG) Oncology Clinics. The ZSFG Cancer Registry was queried to identify patients and collect demographic information,

including race, and *EGFR* mutation status. Electronic medical records were reviewed to confirm the diagnosis of metastatic LAC and *EGFR* mutation status based on pathology and molecular testing reports. Data analysis was performed using descriptive statistics. Results: We identified 110 patients with metastatic LAC diagnosed between 2011 and 2015 at ZSFG Oncology Clinics. The racial composition of the cohort represented the diversity of our patient population, with 31.8 % White (n=35), 26.4 % African American (n=29), 37.3 % Asian (Chinese n=26, Filipino n=10, and other Asians n=5), and 4.5 % unknown (n=5). Seventy-one patients (64.5 %) underwent molecular testing for *EGFR* mutation, thirty-four (30.9 %) were not tested, and five patients (4.5 %) were deemed not candidates for molecular testing as per NCCN guidelines. Among those who were tested for *EGFR* mutation, 35.2% (n=25) harbored an *EGFR* mutation. Eighty percent (n=20) of *EGFR* mutant patients were of Asian race, 16% (n=4) White, and 4% (n=1) African American. Eight patients (23.5 %) did not undergo molecular testing due to insufficient or inadequate samples. Conclusions: Despite guideline recommendations for *EGFR* testing, our study identified that there is widespread underutilization of guideline-recommended testing at our institution, as well as limitations in tissue sampling adequacy for molecular testing. These represent significant barriers to providing guideline-concordant care to our underserved patient population. As a result, the ZSFG Cancer Committee established a quality task force that has newly implemented the following interventions: (1) multidisciplinary evaluation of all new diagnosis of non-small cell lung cancer, and (2) standardized *EGFR* testing as part of a 4-gene mutation panel adherent with guideline recommendations.

D135 Early low-dose lung cancer screening education. [David R Reese](#). Independent Advocate, Athens, TN, USA.

Research results of the Terminate Lung Cancer (TLC) low dose CT early lung cancer screening and detection campaign in three regional study groups in rural East Kentucky. Results include the identification of effective field-tested communication protocols for lung cancer prevention, screening and detection with rural Appalachian population that included many hard to engage participants.

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