

The background of the entire page is a high-angle photograph of the New York City skyline, featuring numerous skyscrapers and the Hudson River. The ASPO logo is positioned in the upper left corner, with the letters 'ASPO' in a large, teal, serif font. Below it, the full name 'American Society of Preventive Oncology' is written in a smaller, teal, serif font. A decorative graphic consisting of a network of blue and green lines with circular nodes is overlaid on the lower half of the image, partially obscuring the cityscape. The bottom half of the page is a solid teal color, which serves as the background for the meeting details.

ASPO

*American Society of
Preventive Oncology*

42nd Annual Meeting New York | 11-13 March 2018

Program & Abstracts
Roosevelt Hotel, New York, NY

Welcome

Welcome to the American Society of Preventive Oncology Annual Meeting

The American Society of Preventive Oncology strives to promote the exchange and dissemination of information and ideas relevant to cancer prevention and control; to identify and stimulate research areas in cancer prevention and control; and to foster the implementation of programs in cancer prevention and control.

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Registration

All conference participants must check in at the registration table located in the Grand Ballroom Foyer to receive name badges and other conference material.

Registration Desk | Roosevelt Hotel | Grand Ballroom Foyer | Mezzanine Level

Sunday, March 11 11:00 a.m.-5:00 p.m.

Monday, March 12 8:00 a.m.-5:00 p.m.

Tuesday, March 13 8:00 a.m.-3:00 p.m.

Wifi

Wi-Fi is available in the hotel lobby and in public spaces in The Roosevelt Hotel.

Social Media

Keep the conversation going! Get the latest meeting updates by following ASPO and join the conversation using #ASPO2018.



General Information

Assistance to Participants

The American Society of Preventive Oncology meeting staff is available to provide assistance or information at any time during the meeting. Questions should be addressed to the staff members and volunteers at the Registration Desk.

Poster Sessions

This year's poster session and reception will be Monday, March 12 in the Terrace and Palm Rooms (lobby level) of the Roosevelt Hotel. Please have your poster displayed by 2 p.m. for judging purposes. Push pins will be available. Every Poster submitted to ASPO will be judged. The poster session and reception will be from 5:30-7:30 p.m. Posters must be taken down by Tuesday at noon. You can find your poster number in the poster directory on pages 34-40.

Prior to the poster session, judges will review all posters and select their top candidates. The awards are:

Best Poster overall: Plaque (to be engraved)

2nd Place Poster honorable mention

3rd Place Poster honorable mention

4th Place Poster honorable mention

Trainee (Pre- and Post-doc) Poster Prizes

2 prizes to be given: 1st and 2nd place each get a \$100 check (contact Heidi Sahel at the registration table)

A distinguished panel of faculty will select outstanding posters at the poster session. Awards will be announced and presented at the end of the poster session, along with a brief discussion of the winners' merits. Presenters should be positioned near their posters during the poster session for discussion and judging. All posters not taken down after the poster session will be removed and put in the registration area.

Meals

Continental breakfast will be served on Monday and Tuesday during the breakfast sessions.

Online Survey

Please respond to the on-line survey that will be sent soon after the meeting. This will help future Program Committees and conference staff to better meet your professional and logistical needs.

Next Year

The 43rd Annual Meeting of the American Society of Preventive Oncology will be: March 9-12, 2019
The Hilton Tampa Downtown, Tampa, FL.

ASPO *American Society of
Preventive Oncology*

March 9-12, 2019

Tampa, FL



Special Acknowledgements

The ASPO Executive Committee offers special thanks to Program Co-Chairs, **Dr. Mary Beth Terry** and **Dr. Michael Scheurer** for their extraordinary commitment in facilitating the development of the program for this meeting, and to the entire 2018 ASPO Program Committee for sharing their expertise and their valuable contributions to the program.

President

Peter Kanetsky, PhD, MPH

Moffitt Cancer Center & Research Institute

Program Co-Chairs:

Mary Beth Terry, PhD

Columbia University

Michael Scheurer, PhD

Baylor College of Medicine

2018 Program Committee Members:

Brenda M. Birmann, ScD

Brigham & Women's Hospital
and Harvard Medical School

Paolo Boffetta, MD

Mount Sinai

Diana Buist, PhD, MPH

Kaiser Permanente Washington

Tracy Crane, PhD

University of Arizona

Joanne Dorgan, PhD

University of Maryland Medical School

Jennifer Elston Lafata, PhD

UNC-Chapel Hill

Peter Kanetsky, PhD, MPH

Moffitt Cancer Center &
Research Institute

Marc Kiviniemi, PhD

University at Buffalo, SUNY

Linda Ko, PhD

Fred Hutchinson Cancer
Research Center

Larry Kushi, ScD

Kaiser Permanente

Steven Patierno, PhD

Duke Cancer Institute

Betsy Shenkman, PhD

University of Florida

Adetunji Toriola, MD, PhD, MPH

Washington University in St. Louis

Charnita Zeigler-Johnson, PhD, MPH

Thomas Jefferson University

ASPO Leadership

ASPO Executive Committee Members

(parentheses indicates term expiration)

President

Peter Kanetsky (2019)

President-Elect

Karen Basen-Engquist (2021)

Past President

Polly Newcomb (2017)

Secretary/Treasurer

Cheryl Thompson (2021)

At-Large Member

Sandi Pruitt (2021)

Li Li (2022)

Shine Chang (2020)

Honorary

Al Neugut

Melissa Bondy

Amy Trentham-Dietz

ACS Representative

Susan Gapstur

ASCO Representative

Ernest Hawk

Staff

Heidi Sahel

Eileen McGuine

Special Interest Groups

Behavioral Science & Health

Communication

Chair: David Cavallo (2019)

Vice-Chair: Carmina Valle

Molecular Epidemiology & The Environment

Chair: Katherine Reeves (2020)

Vice-Chair: TBD

Lifestyle Behaviors, Energy Balance & Chemoprevention

Chair: Elisa Bandera (2019)

Vice-Chair: Marji McCullough

Survivorship & Health Outcomes/ Comparative Effectiveness Research

Chair: Katie Sterba (2018)

Vice-Chair: Erin Kent

Cancer Health Disparities

Chair: Aimee James (2018)

Vice-Chair: Yamile Molina

Early Detection & Risk Prediction of Cancer

Chair: Mira Katz (2018)

Vice-Chair: Jasmin Tiro

Early Career Development

Chair: Hazel Nichols (2018)

Vice-Chair: Allison Burton-Chase

International Issues in Cancer

Chair: Tomi Akinyemiju (2018)

Vice-Chair: Ramzi Salloum

ASPO Award History

Year	Joseph F. Fraumeni, Jr., Distinguished Achievement Award	Distinguished Service Award	Joseph Cullen Award in Tobacco Research
1983	Michael Shimkin		
1984	Ernst Wynder		
1985	Sam Shapiro		
1986	William Haenszel		
1987	Lester Breslow		
1988	Nicholas Petrakis		
1989	Alfred Knudson		
1990	Saxon Graham	John Weisburger	
1991	Barbara Hulka		
1992	David Schottenfeld		Ellen Gritz
1993	Joseph Fraumeni		Thomas Glynn
1994	Anthony Miller	Richard Love	Tracy Orleans
1995	Pelayo Correa		Donald Shopland
1996	Walter Willett	Al Neugut	Michael Fiore
1997	Barbara Rimer		Edward Lichtenstein
1998	Peter Greenwald		Jack Henningfield
1999	J. Potter/W.Ki Hong		John Pierce
2000	Margaret Spitz		Susan Curry
2001	I.B. Weinstein/Ellen Gritz		David Burns
2002	Robert Hoover		Jonathan Samet
2003	Leslie Bernstein		K. Michael Cummings
2004	Dave Alberts		Caryn Lerman
2005	Graham Colditz		Stanton Glantz
2006	Frank Meyskens	Carolyn Aldige	Gary Giovino
2007	Bernard Levin		Michael Thun
2008	Malcolm C. Pike		David Abrams
2009	Mitchell Gail		Ronald Davis (posthumously)
2010	Paul Engstrom		Jasjit Ahluwalia
2011	Patricia Ganz		Alex Prokhorov
2012	Electra Paskett		Stephen Hecht
2013	Polly Newcomb		Dave Wetter
2014	Bob Croyle		Vish Vishwanath
2015	Richard R. Love	Amy Trentham-Dietz	Cheryl L. Perry
2016	Alfred I. Neugut		Peter Shields
2017	Timothy Rebbeck		Kurt Ribisl
2018	Beti Thompson		Thomas Brandon

2018 Awards

2018 ASPO Joseph F. Fraumeni, Jr., Distinguished Achievement Awardee

Beti Thompson, PhD, Fred Hutchinson Cancer Research Center

2018 Joseph Cullen Award in Tobacco Research

Thomas Brandon, PhD, Moffitt Cancer Center & Research Institute

ACS Travel Awards

Seventh Annual Calle/Rodriguez Minority Travel Awards for a Top-Ranked Abstract

Travel Funded by The American Cancer Society

Elizabeth Cespedes Feliciano, ScD, ScM, Kaiser Permanente Division of Research

Overall and visceral adiposity are associated with incident cardiovascular disease among breast cancer patients: Results from the B-SCANS Study

Yamile Molina, MS, MPH, PhD, University of Illinois at Chicago

Empowering Latinas to Obtain Breast Cancer Screenings: Comparing Intervention Effects, Part 2

ASPO Travel Awards

Seventh Annual Electra Paskett Scholarship Travel Award for the Top-Ranked Pre- or Post-doctoral fellow

Ana Florea, MPH, BS, University of Arizona College of Public Health

Ethnic Disparities in Gastric Cancer Presentation and Screening Practice in the United States: An Analysis of 1997-2010 SEER-Medicare Data

Other ASPO Travel Awards chosen from top-ranked abstracts

Joshua Demb, MPH, University of California, San Francisco

Cumulative incidence of non-breast cancer mortality and breast cancer risk by comorbidity and age among older women undergoing screening mammography: The Medicare-linked Breast Cancer Surveillance Consortium cohort study

Chunzhe Duan, PhD, Moffitt Cancer Center & Research Institute

Family History of Melanoma and Lifetime Patterns of Daytime Hours Spent Outdoors in Melanoma-prone Families

Jessica McNeil, Postdoctoral Fellow, Alberta Health Services

Sleep and cancer incidence in Alberta's Tomorrow Project cohort

Support Acknowledgements

The Program Committee wishes to express appreciation to the following organizations for their commitment to supporting ASPO.

Memorial Sloan-Kettering Cancer Center

Rutgers Cancer Institute of New Jersey

NYU Perlmutter Cancer Center

Herbert Irving Comprehensive Cancer

The Ohio State University Comprehensive Cancer Center

The Newcomb Family Foundation

National Institutes of Health

Funding for this conference was made possible in part by (R13CA228494-01) from the National Cancer Institute. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organization imply endorsement by the U.S. Government.

American Cancer Society

In 2012, the American Cancer Society and American Society of Preventive Oncology announced the first annual "Calle/Rodriguez Minority Travel Award for a Top-Ranked Abstract" funded by the American Cancer Society. Drs. Jeanne Calle and Carmen Rodriguez were highly-respected epidemiologists, beloved colleagues and friends to many in the cancer research community. As Vice President of Epidemiology at the American Cancer Society, Dr. Calle was Principal Investigator of the Cancer Prevention Study (CPS)-II, a prospective study of more than one million men and women designed to identify risk factors for cancer. In particular, Dr. Calle was the lead author on widely-cited landmark studies establishing the link between obesity and cancer risk. She also guided the development and initiation of CPS-III, a study that will further our understanding of the causes of cancer and ways to prevent it for the next generation. A physician from Spain, Dr. Rodriguez was the Strategic Director of the CPS-II biospecimen repository. She published more than 100 scientific articles, with a special interest in studying ovarian and prostate cancers. Her work on the associations between hormone replacement therapy and cancer risk earned widespread media attention. Dr. Rodriguez also served as a Spanish-speaking spokesperson for the American Cancer Society. Professionally, Jeanne and Carmen were more than scientists; they were valued colleagues and committed mentors to many. Carmen and Jeanne passed away within months of each other in 2008-2009. While their deaths have been a tremendous loss, their spirits will live on in part due to the generosity of others whose donations allow the American Cancer Society to create this memorial award.

Exhibitors



Nutramax Laboratories

Nutramax Laboratories Consumer Care, Inc. is an industry leader in research, development, and manufacturing of quality supplements. Avmacol® is an innovative supplement that supports sulforaphane production by providing glucoraphanin and active myrosinase enzyme via our exclusive Sulforaphane Production System®. Sulforaphane stimulates your body's natural detoxification process for certain environmental threats found in the air you breathe, the food you eat, and the water you drink. Research has shown sulforaphane also supports the body's defenses against oxidative stress and cell damage. Visit the Avmacol exhibit or go to Avmacol.com to learn more about Avmacol and why it has been selected by researchers for use in clinical trials.



H. Lee Moffitt Cancer Center and Research Institute

Moffitt.org

Moffitt Cancer Center strives to be the leader in understanding the complexity of cancer through team science and applying those insights for human benefit. Be part of the prevention or cure by joining our team of over 800 research faculty, career research scientists, postdocs, graduate students, and support staff dedicated to cancer research.



American Institute for Cancer Research

The American Institute for Cancer Research champions the latest and most authoritative scientific research from around the world on cancer prevention and survival through diet, weight and physical activity. We do this so we can help people make informed lifestyle choices to reduce their cancer risk.



Centers for Disease Control

The Centers for Disease Control & Prevention (CDC) is a leader in nationwide efforts to ease the burden of cancer. Through the Division of Cancer Prevention & Control, CDC works with national cancer organizations, state health agencies, and other groups to develop, implement, and promote strategies for preventing and controlling cancer. Reliable-Trusted-Scientific www.cdc.gov/cancer



Invitae

Invitae, a genetic information company, is bringing genetic testing into mainstream medical practice by providing high-quality, affordable genetic testing.

Exhibitors



Li Fraumeni Syndrome Association

The Li Fraumeni Syndrome Association provides a wide range of information, advocacy, and support services for individuals and families with Li-Fraumeni Syndrome (LFS). We support a consortium of researchers, medical providers, and caregivers to further research and promote optimal care for the LFS community.



Rutgers Cancer Institute of New Jersey



Medical University of South Carolina



Epigenomics

Epigenomics is a molecular diagnostics company focused on developing innovative screening tests for cancer. Our lead product, Epi proColon, is the first and only FDA approved blood test for colorectal cancer screening in non-screened patients. Epi proColon detects methylated Septin 9 DNA in plasma via real time PCR.

Agenda

SATURDAY, MARCH 10, 2018

Noon - 3:00 p.m. **Mock Study Section** (Invitation only)
Sutton Suite

3:00 p.m. - 7:00 p.m. **Cancer Prevention & Control Associate Directors/Program Leaders Workshop - Part 1**
Terrace Room (Invitation only)
Organizer: Electra Paskett, PhD, The Ohio State University

SUNDAY, MARCH 11, 2018

10:00 a.m. - 5:00 p.m. **Conference Registration**
Ballroom Foyer

8:00 a.m. - Noon **Cancer Prevention & Control Associate Directors/Program Leaders Workshop - Part 2**
Terrace Room (Invitation only)
Organizer: Electra Paskett, PhD, The Ohio State University

9:00 a.m. - Noon **New Investigators Workshop** (Invitation only)
Promenade Suite Organizer: Judith Jacobson, DrPH, MPH, Columbia University

Faculty:

Bette Caan, DrPH, Kaiser Permanente
Deborah Glueck, PhD, University of Colorado-Denver
Polly Newcomb, PhD, Fred Hutchinson Cancer Research Center
Michael Scheurer, PhD, Baylor College of Medicine

Selected Participants:

Susan Chadid, PhD, Johns Hopkins University
Elizabeth M. Cespedes Feliciano, ScD, ScM, Kaiser Permanente
Catherine Marinac, PhD, Harvard University
Nicole Niehoff, MSPH, University of North Carolina
Jeremy M. Schraw, PhD, Baylor College of Medicine
Laurie E. Steffen, PhD, Wake Forest School of Medicine

12:30 p.m. - 3:00 p.m. **Working Lunch Meeting of the ASPO Executive Committee** (Invitation only)
Hudson Suite

Agenda

SUNDAY, MARCH 11, 2018 (Cont.)

1:00 p.m. - 3:45 p.m. **ASPO Junior Members Sessions**

1:00 p.m. - 2:15 p.m. **Session 1: Negotiation: Strategies and Best Practices**

Terrace Room

Chairs:

Alexandra White, PhD, National Institute of Environmental Health Sciences

Alicia Best, PhD, The University of South Florida

Panelists:

Wendy Demark-Wahnefried, PhD, University of Alabama at Birmingham

Humberto Parada, PhD, San Diego State University

Eyal Oren, PhD, San Diego State University

Allison Burton-Chase, PhD, Albany College of Pharmacy & Health Sciences

2:30 p.m. - 3:45 p.m.

Terrace Room

Session 2: Industry vs. Academia: Making a Decision for the Next Step in Your Career

Chairs:

Adriana Coletta, PhD, University of Texas M.D. Anderson Cancer Center

Heather Leach, PhD, Colorado State University

Speakers:

Gary Foster, PhD, Chief Scientific Officer, Weight Watchers

Kai-Li Liaw, PhD, Merck Research Labs

Wendy Demark-Wahnefried, PhD, University of Alabama at Birmingham

Shelley Tworoger, PhD, Moffitt Cancer Center & Research Institute

Scherezade Mama, PhD, Pennsylvania State University

Lisa Cadmus-Bertram, PhD, University of Wisconsin-Madison

3:00 p.m. - 4:00 p.m.

East End Suite

Meeting of NCI R25T& T32 Training Program Principal Investigators

Organizer: **Shine Chang, PhD**, University of Texas M.D. Anderson Cancer Center

4:10 p.m. - 4:20 p.m.

Grand Ballroom

Opening Session of the ASPO General Meeting

President: **Peter Kanetsky, PhD, MPH**, Moffitt Cancer Center & Research Institute
ASPO Welcome

4:20 p.m. - 4:55 p.m.

Grand Ballroom

Cullen Tobacco Address

Thomas H. Brandon, PhD, Director, Tobacco Research & Intervention Program,
Moffitt Cancer Center & Research Institute

Tobacco research and control: We live in interesting times

4:55 p.m. - 5:30 p.m.

Grand Ballroom

Fraumeni Distinguished Achievement Award Address

Beti Thompson, PhD, Associate Director of Minority Health and Health Disparities,
Fred Hutchinson Cancer Research Center

A life of health disparities: Four stories

Agenda

SUNDAY, MARCH 11, 2018 (Cont.)

5:30 p.m. - 7:00 p.m.
Grand Ballroom

Symposium 1

Can Primary and Secondary Prevention be Improved through Precision Medicine?

Chair: **Mary Beth Terry, PhD**, Columbia University

A panel discussion with experts in public health genomics, epidemiology, behavioral science, health care systems delivery focused on reviewing the promise and pitfalls of targeting primary and secondary cancer prevention based on genomics and other molecular markers in addition to standard risk assessment through family history and risk factors.

The goal of the panel is to bring together experts in health care delivery systems to discuss the challenges in implementation with behavioral scientists with research expertise in measuring uptake and barriers of genomic testing. The panel will discuss how issues with implementation and individual choice for testing may help guide the types of questions that are addressed with primary research by genetic and molecular epidemiologists to enhance long-term implementation.

Speakers:

Kathy J. Helzlsouer, MD, MHS, National Cancer Institute

Nazneen Aziz, PhD, Kaiser Permanente Research Bank

Kim Kaphingst, PhD, University of Utah

Discussant: **Diana Buist, PhD**, Kaiser Permanente Washington

7:00 p.m. - 8:00 p.m.
Ballroom Foyer

Networking Mixer at hotel (*cash bar and light appetizers*)

8:00 p.m.

Dinner on your own

Agenda

MONDAY, MARCH 12, 2018

8:00 a.m. - 9:30 a.m.
Vanderbilt Suite

**Concurrent Special Interest Group Breakfast Session
Behavioral Science & Health Communication**

Behavioral and communication perspectives on precision medicine: Translating findings to motivate change through intervention

Chairs:

David Cavallo, PhD, Case Western Reserve University

Jennifer Hay, PhD, Memorial Sloan-Kettering Cancer Center

Roundtable Discussants:

Abbey Berenson, MD, PhD, University of Texas Medical Branch Health

Jada Hamilton, PhD, MPH, Memorial Sloan-Kettering Cancer Center

Kim Kaphingst, PhD, University of Utah

Suzanne O'Neill, PhD, Georgetown University

Susan Vadaparampil, PhD, Moffitt Cancer Center & Research Institute

8:00 a.m. - 9:30 a.m.
Terrace Room

**Concurrent Special Interest Group Breakfast Session
Lifestyle Behaviors, Energy Balance & Chemoprevention**

Food, nutrition, physical activity and cancer: How evolving science is incorporated into public health recommendations

Chairs:

Elisa Bandera, MD, PhD, Rutgers Cancer Institute of New Jersey

Marjorie McCullough, ScD, RD, American Cancer Society

Panelists:

Elisa V. Bandera, MD, PhD, Rutgers Cancer Institute of New Jersey

Food, nutrition, physical activity and cancer: The WCRF/AICR Continuous Update Project: Process and goals

Edward Giovannucci, ScD, Harvard School of Public Health

Food, nutrition, physical activity and cancer: The WCRF/AICR Continuous Update Project: Main findings

Susan M. Gapstur, PhD, American Cancer Society

Modifiable risk factors and cancer prevention: Recent population attributable fraction estimates in the United States

Marjorie McCullough, ScD, RD, American Cancer Society

The ACS Guidelines on Nutrition and Physical Activity for Cancer Prevention: Purpose, process and current status

Panel Discussion

Future research needs

9:30 a.m. - 10:00 a.m.

Break

Agenda

MONDAY, MARCH 12, 2018 (Cont.)

10:00 a.m. - 11:30 a.m.

Grand Ballroom

Symposium 2

Premalignant Conditions and Prevention

Chair: **Brenda Birmann, ScD**, Brigham and Women's Hospital and Harvard Medical School

This symposium will summarize current knowledge on precursor conditions and their respective malignancies, including aspects of basic and clinical science, risk factors, and potential or translation-ready implications for primary and secondary prevention. We will focus on three diverse examples, including bladder cancer (and pre-neoplastic forms), multiple myeloma (and monoclonal gammopathy of undetermined significance or MGUS) and melanoma (and dysplastic nevi). The three cancer-specific presentations will be followed by synthesizing comments and a moderated group discussion.

Speakers:

Ola Landgren, MD, PhD, Memorial Sloan-Kettering Cancer Center

Allan Halpern, MD, Memorial Sloan-Kettering Cancer Center

Carlos Cordon-Cardo, MD, PhD, Mount Sinai School of Medicine

Discussant: **Paolo Boffetta, MD**, Mount Sinai School of Medicine

11:30 a.m. - Noon

Grand Ballroom

ASPO Business Meeting (Open to all)

Noon - 1:30pm

Lunch on your own

1:30 p.m. - 3:00 p.m.

Grand Ballroom

Concurrent Paper Session

Session 1

Diet, Obesity, and Healthy Living

Presentations were selected from top ranking proffered abstracts

Chair: **Karen Basen-Engquist, PhD**, University of Texas M.D. Anderson Cancer Center

Presenters:

Elizabeth Cespedes Feliciano, ScD, ScM, Kaiser Permanente

Overall and visceral adiposity are associated with incident cardiovascular disease among breast cancer patients: Results from the B-SCANS Study

Sylvia Crowder, MS, RDN, LDN, University of Illinois

Pre-treatment dietary patterns are associated with the presence of symptoms 1 year after diagnosis in patients with head and neck cancer

Jessica McNeil, PhD, Alberta Health Services

Sleep and cancer incidence in Alberta's Tomorrow Project cohort

Jennifer Bail, PhD, University of Alabama at Birmingham

Assessing the Feasibility of a Mentored Home-Based Vegetable Gardening Intervention Among Breast Cancer Survivors in the Deep South

Cindy Blair, PhD, MPH, University of New Mexico

Correlates of physical inactivity and interest in becoming physically active among ethnically diverse rural and urban colorectal cancer survivors in New Mexico

Adriana Coletta, PhD, RD, University of Texas M.D. Anderson Cancer Center

The Impact of Lifestyle Intervention and Metformin on Long-term Reductions in Visceral Fat among Women at High Risk for Endometrial Cancer

Agenda

MONDAY, MARCH 12, 2018 (Cont.)

1:30 p.m. - 3:00 p.m.
Vanderbilt Suite

Concurrent Paper Session

Session 2

Cancer Screening and Surveillance

Presentations were selected from top ranking proffered abstracts

Chair: **Mira Katz, PhD**, The Ohio State University

Presenters:

Dejana Braithwaite, PhD, Georgetown University

Breast density and risk of invasive breast cancer among older women undergoing mammography:

The Breast Cancer Surveillance Consortium cohort study

Gordon Watt, BA, University of Texas Health Science Center at Houston

Prevalence and Characteristics of Liver Fibrosis Detected by Elastography: Results from the Cameron

County Hispanic Cohort

Diana Buist, PhD, MPH, Kaiser Permanente Washington

Can home-based HPV self-sampling improve cervical cancer screening adherence in

underscreened women? Results from the HOME pragmatic randomized trial.

Ana Florea, MPH, University of Arizona

Ethnic Disparities in Gastric Cancer Presentation and Screening Practice in the United States: An

Analysis of 1997-2010 SEER-Medicare Data

Kathryn Taylor, PhD, Georgetown University

Clinical and Psychological Predictors of Switching from Active Surveillance to Active Treatment

Among Men with Low-Risk Prostate Cancer: the PREPARE Prospective Cohort Study

Joshua Demb, MPH, University of California - San Francisco

Cumulative incidence of non-breast cancer mortality and breast cancer risk by

comorbidity and age among older women undergoing screening mammography: The

Medicare-linked Breast Cancer Surveillance Consortium cohort study

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

Break

Agenda

MONDAY, MARCH 12, 2018 (Cont.)

3:30 p.m. – 5:00 p.m.
Grand Ballroom

Symposium 3

The Opportunities and Challenges of Electronic Health Records in Cancer Prevention

Chairs:

Lawrence Kushi, ScD, Kaiser Permanente

Elizabeth Shenkman, PhD, University of Florida

This symposium will provide insights into the use of electronic health records (EHRs) in cancer prevention and control, provide specific examples illustrating the opportunities and challenges in use of EHRs for research and prevention, and to describe challenges and limitations of EHRs and potential approaches to addressing these challenges.

Speakers:

Marilyn Kwan, PhD, Kaiser Permanente Northern California

Using EHRs in cancer etiology research: lessons learned from research on medical radiation exposure and risk of childhood cancers

Celette Sugg Skinner, PhD, University of Texas Southwestern

The role of EHRs in understanding opportunities to improve colorectal cancer screening

Jennifer Elston-Lafata, PhD, University of North Carolina, Chapel Hill

EHRs and patient portals: A means to provide cancer screening support to some patients and facilitate pragmatic trial enrollment

Maureen Smith, MD, MPH, PhD, University of Wisconsin-Madison

Placing EHRs in cancer prevention and control research in context

5:00 p.m. – 5:30 p.m.

Break

5:30 p.m. – 7:30 p.m.
Terrace &
Palm Rooms

Poster Session and Reception (cash bar and light appetizers)

Presentation of Best Poster Awards

Presentation of Electra Paskett Scholarship Award

Presentation of American Cancer Society Travel Awards

Presentation of ASPO Travel Awards

7:30 p.m.

Dinner on your own

Agenda

TUESDAY, MARCH 13, 2018

7:45 a.m. - 9:00 a.m.
Plaza Suite

Concurrent Special Interest Group Breakfast Session
Early Detection & Risk Prediction: Results of the ASPO Precision Cancer Screening Survey

Chairs:

Mira Katz, PhD, The Ohio State University

Jasmin Tiro, PhD, University of Texas Southwestern Medical Center

7:45 a.m. - 9:00 a.m.
Vanderbilt Room

Concurrent Special Interest Group Breakfast Session
International Issues in Cancer & Cancer Health Disparities

Call to Action: Towards the Global Elimination of Cervical Cancer by 2030

Chair: Tomi Akinyemiju, PhD, University of Kentucky

Speakers:

Anna Giuliano, PhD, Moffitt Cancer Center & Research Institute

Susan Vadaparampil, PhD, Moffitt Cancer Center & Research Institute

9:00 a.m. - 10:00 a.m.

Concurrent Career Development Sessions

9:00 a.m. - 10:00 a.m.
Grand Ballroom

ASPO Junior Members (Open to all)

NCI Session on Career Development for Doctoral Students, Postdoctoral Fellows, and Junior Faculty (organized by Junior Member SIG)

Susan Perkins, PhD, Deputy Chief, Cancer Training Branch, National Cancer Institute

9:00 a.m. - 10:00 a.m.
Promenade Suite

Mid- and Senior Faculty Development

Toby Tetenbaum, PhD, Fordham University

Mentoring the Mentor: Providing Coaching to your Junior Faculty

10:00 a.m. - 10:15 a.m. Break

Agenda

TUESDAY, MARCH 13, 2018 (Cont.)

10:15 a.m. - 11:45 a.m.
Grand Ballroom

Symposium 4

Targeting Inflammation for Cancer Prevention

Chair: **Adetunji Toriola, PhD**, Washington University in St. Louis

This symposium will bring together experts from across complementary disciplines including laboratory, diet and nutrition, and behavioral sciences to highlight current advances in research on inflammation and prevention of cancer (primary, secondary, and/or tertiary) with the goal of providing an appreciation for the complex landscape of this research area while highlighting challenges and benefits of including measures of inflammation in prevention research.

Speakers:

Andrew Dannenberg, MD, Weill Cornell Medicine

Breast Adipose Inflammation: a Silent Killer

Susan Steck, PhD, MPH, RD, University of South Carolina

Anti-inflammatory diets and cancer

Barbara L. Andersen, PhD, The Ohio State University

Immunity and inflammation: observational and experimental trials

Manila Hada, PhD, National Cancer Institute (Chosen from top-ranked abstracts)

Pre-diagnostic serum levels of arachidonic acid and linoleic acid metabolites and risk of ovarian cancer in the Prostate, Lung, Colorectal and Ovarian Cancer (PLCO) Screening Trial

Author(s): Hada M, Black A, Eldin ML, Hartge P, Lih FB, Wentzensen N, Zeldin DC, Trabert B.

Abstract: Introduction Inflammation is a strong risk factor for ovarian cancer but the mechanism is not well understood. Several studies demonstrate that inflammation related to ovulation, endometriosis, and pelvic inflammatory disease is associated with increased risk for ovarian cancer. Evidence also suggests that anti-inflammatory drugs, including aspirin, decrease risk. Aspirin and other NSAIDs block the synthesis of prostanoids by inhibiting the cyclooxygenase (COX) enzyme. Studies of inflammatory mediators, lipid molecules such as arachidonic acid (AA) and linoleic acid (LA) metabolites, and subsequent development of ovarian cancer are essential to uncovering mechanism. Method We conducted a study nested within in the PLCO Cancer Screening Trial to measure pre-diagnostic serum levels of 32 AA/LA metabolites, representing 3 different pathways [COX, cytochrome P450 (P450), and lipoxygenase (LOX)]. We measured levels in 157 women who eventually... intervals (CI) for the association between metabolite levels and risk of ovarian cancer, overall and by histologic subtype (serous/non-serous), using logistic regression and adjusted for matching factors and potential confounders. Result Five of the 32 AA/LA metabolites evaluated were positively associated with ovarian cancer risk: 12-13-DHOME [Tertile 3 vs. 1: OR 2.44 (95% CI 1.27- 4.70), p-trend 0.01], 13-HODE [2.45 (1.30- 4.58), 0.01], 9-HODE [1.95 (1.05-3.63), 0.03], 9,12,13-THOME [2.23 (1.19-4.16), 0.01], 8-HETE [1.83 (1.01-3.26), 0.04]. In analyses by subtype, heterogeneity was observed for 2 metabolites: 12-13-EpOME [serous: 1.95 (0.90-4.21)], non-serous: 0.81 (0.39-1.70), p-het 0.02] and 8-HETE [2.48 (1.16-5.30), 1.16 (0.57-2.39), p-het 0.01], suggesting increased serous tumor risk. Increased levels of five fatty acid metabolites (12-13-DHOME, 13-HODE, 9-HODE, 9,12,13-THOME, and 8-HETE) are associated with increased ovarian cancer risk. All five metabolites are derived from either LA (12-13-DHOME, 13-HODE, 9,12,13-THOME, 9-HODE) or AA (8-HETE) via metabolism through the LOX/ P450 pathway. Future studies replicating these findings and/or evaluating LOX/P450 pathway metabolism and ovarian carcinogenesis are warranted.

11:45 a.m. - 12:45 p.m. Lunch on your own

Agenda

TUESDAY, MARCH 13, 2018 (Cont.)

12:45 p.m. - 2:15 p.m.
Vanderbilt Room

Concurrent Paper Session Session 3

Health Disparities in Cancer Prevention

Presentations were selected from top ranking proffered abstracts

Chair: **Yamile Molina, PhD**, University of Illinois at Chicago

Presenters:

Yamile Molina, MS, MPH, PhD, University of Illinois at Chicago

Empowering Latinas to Obtain Breast Cancer Screenings: Comparing Intervention Effects, Part 2

Kaitlin Voigts, RN, BSN, University of Kentucky

Using Social Media to Reduce Multiple Risk Factors for CRC in Rural Appalachians: #CRCFREE

Maria Elena Martinez, PhD, University of California - San Diego

Race, Ethnicity, Socioeconomic Status and Site-specific Risk for Gastric Cancer

Kelly Hughes, PhD, Minnesota Department of Health

Financial Incentives and Proactive Calling for Promoting Tobacco Treatment Engagement in a Low-income Population: A Factorial Randomized Trial

Chelsea Anderson, MPH, University of North Carolina at Chapel Hill

Mortality disparities after adolescent and young adult cancer

Megan Mullins, MPH, University of Michigan

Neighborhood and Individual Social Barriers to Care-Seeking for Ovarian Cancer Symptoms in African American Women

12:45 - 2:15 p.m.
Grand Ballroom

Concurrent Paper Session Session 4

Molecular Epidemiology and the Environment

Presentations were selected from top ranking proffered abstracts

Chair: **Michael Scheurer, PhD**, Baylor College of Medicine

Presenters:

Katherine Reeves, PhD, MPH, University of Massachusetts Amherst

Phthalate metabolites and postmenopausal breast cancer risk

Chunzhe Duan, PhD, Moffitt Cancer Center & Research Institute

Family History of Melanoma and Lifetime Patterns of Daytime Hours Spent Outdoors in Melanoma-prone Families

Darren Mays, PhD, MPH, Georgetown University

Genetic Associations with Indoor Tanning Addiction

Kathleen Sturgeon, PhD, MTR, Pennsylvania State University

Commercially Available Lifestyle Modification Program Decreases Inflammatory Biomarkers in BRCA1/2+ Breast Cancer Survivors

Charnita Zeigler-Johnson, PhD, MPH, Thomas Jefferson University

Interactive Effects of Obesity and Androgen Receptor Polymorphisms on Prostate Cancer Outcomes

Humberto Parada, PhD, San Diego State University

Urinary metabolites of environmental phenols and breast cancer incidence: the Long Island Breast Cancer Study Project

Agenda

TUESDAY, MARCH 13, 2018 (Cont.)

2:20 p.m. - 3:30 p.m.
Grand Ballroom

Special Closing Session

Securing the Future for Cancer Prevention

Moderator: **Peter Kanetsky, PhD, MPH**, Moffitt Cancer Center & Research Institute

Join our panel of visionary leaders who will highlight the current realities of conducting cancer prevention research and will discuss the challenges and opportunities facing our discipline.

Panelists:

Cory Abate-Shen, PhD, Director, Herbert Irving Comprehensive Cancer Center

Paolo Boffetta, MD, Associate Director of Population Sciences, The Tisch Cancer Institute

Kathy Helzlsouer, MD, MHS, Associate Director, Epidemiology and Genomics Research Program,
National Cancer Institute

Thomas Sellers, PhD, MPH, Director, Moffitt Cancer Center & Research Institute

Craig B. Thompson, MD, President and CEO, Memorial Sloan-Kettering Cancer Center

Deborah Winn, PhD, Deputy Director, Division of Cancer Control and Population Sciences,
National Cancer Institute

3:30 p.m.

Conference Concludes

Abstracts Selected for Oral Presentation

Session 1: Diet, Obesity, Healthy Living Monday, March 12, 1:45-3:15 p.m.

Overall and visceral adiposity are associated with incident cardiovascular disease among breast cancer patients: Results from the B-SCANS Study

Cespedes Feliciano EM, Chen WY, Kroenke CH, Bradshaw PT, Alexeeff S, and Caan BJ
Presenter: ***Elizabeth Cespedes Feliciano**, ScD, ScM, Kaiser Permanente Division of Research

PURPOSE: It is assumed that total and visceral adiposity increase cardiovascular disease (CVD) risk among breast cancer survivors; yet, these associations have not been studied, and could differ from non-cancer populations due to the modifying effects of cancer treatment.

METHODS: We studied 2,630 Stage I-III breast cancer patients without pre-existing CVD diagnosed at Kaiser Permanente (2006-2013). We quantified body composition from computed tomography scans taken at breast cancer diagnosis. The main exposures were total and visceral adiposity indices (cm²/m²), examined in tertiles. From ICD codes, we identified non-fatal stroke, coronary artery disease (CAD), and heart failure, and a composite outcome including CVD death (CVD). We estimated hazard ratios (HR) and 95% confidence intervals (CI) adjusting for age, smoking, tumor (stage, grade, and ER/PR and HER2 status) and treatment (chemotherapy and/or radiation) factors, skeletal muscle index (SMI), and body mass index (BMI) residuals. We assessed effect modification via product terms of adiposity with age (≥ 55 years), sarcopenia ($SMI \geq 40$ cm²/m²) and chemotherapy (yes/no).

RESULTS: At diagnosis, mean (SD) age was 55 (11) years and BMI was 28 (6) kg/m². Over a maximum follow-up of 11 years, 669 CVD events occurred. Independent of BMI and other covariates, women in the highest (v. lowest) tertile of total adiposity had a higher risk of CVD, heart failure, stroke and CAD; HRs (95%CI) were 1.45 (1.15-1.81), 1.78 (1.24-2.57), 1.89 (1.25-2.87), and 1.52 (0.83-2.79), respectively. Results were similar for visceral adiposity, and by age and sarcopenia, but were stronger for women receiving chemotherapy: e.g., the HR (95%CI) for the highest (v. lowest) tertile of total adiposity with CVD risk was 1.76 (1.33-2.33) for women who received chemotherapy versus 0.93 (0.63-1.38) for women who did not, p-interaction=0.04.

CONCLUSIONS: Women who enter a breast cancer diagnosis with greater total and visceral adiposity are at higher risk of subsequent CVD, particularly if they receive chemotherapy. Our results suggest that body composition - independent of BMI and other factors - can identify patients with high CVD risk for additional monitoring, tailored treatment plans and targeting of preventive interventions.

Pre-treatment dietary patterns are associated with the presence of symptoms 1 year after diagnosis in patients with head and neck cancer

Crowder SL, Mondul AM, Tang YC, Pepino MY, Rozek LS, Wolf GT, Arthur AE.
Presenter: **Sylvia Crowder**, MS, RDN, LDN, University of Illinois

Purpose: 90% of head and neck cancer (HNC) survivors experience disease and treatment related symptoms. Diet has the potential to reduce inflammation, modulate epigenetic changes and affect biological processes involved in the pathogenesis of symptoms. The objective of this study was to determine if pre-treatment dietary patterns are associated with the presence of symptoms 1-year after diagnosis.

Methods: This was a longitudinal study of 295 newly diagnosed HNC patients. All patients completed a food frequency questionnaire and epidemiologic health survey. Self-reported symptoms were assessed pre-treatment and 1-year after diagnosis using a Likert scale ranging from "1: not at all bothered" by symptom to "5: extremely bothered". Symptom scores were dichotomized as "not at all" vs "slight - extremely". Principal component analysis was used to derive pre-treatment dietary patterns. Multivariable logistic regression models examined the association of derived dietary patterns (fit by quartiles) and seven symptoms (trismus, xerostomia, dysphagia of liquids, dysphagia of solids, difficulty chewing, taste and mucositis). An overall symptom summary score was calculated (range 8 – 39) and dichotomized as < 17 vs. ≥ 17 . This cut-off was chosen by examining the distribution of scores and categorizing into two distinct subgroups naturally present in the data.

Results: Two dietary patterns emerged: Prudent (high intakes of vegetables, fruit, fish, poultry, and whole grains) and Western (high intakes of red and processed meats, refined grains, potatoes, and French fries). After adjusting for age, baseline symptoms, tumor site, cancer stage, smoking, calories and HPV status, significant inverse associations were observed between pre-treatment Prudent pattern score and dysphagia of liquids ($p=0.01$), dysphagia of solids ($p=0.02$) and difficulty chewing ($p=0.02$) at 1 year post-diagnosis. A statistically significant inverse association was observed between the overall symptom summary score and the Prudent pattern ($p<0.001$). No significant associations were observed between the Western pattern and symptoms.

Conclusion: Consumption of a pre-treatment Prudent diet may help reduce the risk of symptoms such as dysphagia and difficulty chewing 1-year after diagnosis in HNC survivors.

*Indicates a recipient of a travel scholarship

Abstracts Selected for Oral Presentation

Session 1: Diet, Obesity, Healthy Living Monday, March 12, 1:45-3:15 p.m. (Cont.)

Sleep and cancer incidence in Alberta's Tomorrow Project cohort

McNeil J, Barberio A, Friedenreich CM, Brenner DR
Presenter: ***Jessica McNeil**, Postdoctoral Fellow,
Alberta Health Services

Study Purpose: We aimed to investigate the association between self-reported sleep duration and sleep timing midpoint with all- and site-specific cancer incidence in Alberta's Tomorrow Project (ATP) cohort.

Methods: The analysis for sleep duration included 46,300 Albertans aged 35-65 years at baseline from the ATP cohort recruited from 2001-2015. Sleep timing midpoint (wake-time – ½ sleep duration) was assessed in a subset of ATP participants (n = 19,820). Cancer incidence was determined through record linkage with the Alberta Cancer Registry in December 2016. Cox proportional hazard regression models evaluated the effects of sleep duration and sleep timing midpoint categories on all- and site-specific (breast, colorectal, lung, prostate, endometrial and hematologic) cancer incidence. Models were adjusted for age, sex (non sex-specific cancers), highest level of education, total household income, marital status, alcohol intake, smoking status, body mass index, family history of cancer, presence of at least one medical

condition/co-morbidity, menopausal status (female cancers only) and sleep duration (sleep timing midpoint analysis only). **Results:** By 2016, there were 3,034 incident cases of cancer in this cohort. A statistical trend was noted for an increased risk of all cancers in participants reporting > 9 hours of sleep/night compared to 7-9 hours of sleep/night (hazard ratio (HR) = 1.16, 95% confidence interval (CI): 0.98-1.36; P = 0.08). Reporting > 9 hours of sleep/night compared to 7-9 hours of sleep/night was also associated with an increased incidence of endometrial cancer (HR = 2.09, 95% CI: 1.16-3.76; P = 0.01). A later sleep timing midpoint (> 4:08AM) versus an intermediate sleep timing midpoint (3:47AM-4:08AM) was associated with an increased risk of all (HR = 1.19, 95% CI: 1.03-1.37; P = 0.02) and breast (HR = 1.64, 95% CI: 1.18-2.26; P = 0.003) cancer incidence.

Conclusions: These novel findings provide evidence regarding the important role of sleep in cancer etiology. Interventions that put emphasis on proper sleep hygiene for cancer prevention are needed.

Assessing the Feasibility of a Mentored Home-Based Vegetable Gardening Intervention Among Breast Cancer Survivors in the Deep South

Bail JR, Frugé AD, Cases MG, Smith KP, Cantor AB, De Los Santos J, Locher JL, Cohen HJ, Demark-Wahnefried W

Presenter: **Jennifer Bail**, PhD, University of Alabama at Birmingham

Purpose: To assess the feasibility of a mentored home-based vegetable gardening intervention among Breast Cancer Survivors (BCS) residing in the Birmingham, Alabama metropolitan area.

Methods: Using a wait-list control design, BCS were randomized to either a year-long vegetable gardening intervention or a wait-list control. Intervention participants were provided with necessary supplies and paired with a Master Gardener from the Cooperative Extension. Master Gardeners mentored participants in planning, planting, and maintaining 3 seasonal gardens over 12 months, conducted monthly home-visits, and checked in bi-weekly via telephone or email. Feasibility assessment criteria consisted of participant accrual, retention, and satisfaction rates of ≥80%. Target participant accrual was 100. Participant satisfaction data were collected after study completion via structured telephone debriefing. Descriptive statistics were conducted using SPSS V24. **Results:** 82 BCS (Mage=60 (39-84); Msurvivorship=5 years (0.5-23); Mco-morbidities=3.5 (0-12); ≥2 functional limitations=86.6%; Caucasian=73.2%; African-American=26.8%) enrolled (82% accrual). Of these, four did not complete the study (2 refused to be wait-listed due to not wanting to wait to garden, 1 withdrew due to family obligations, and 1 was lost to follow-up), resulting in a retention rate of 95% over a 1-year period. All BCS who completed the intervention (n=42) rated their Harvest for Health experience as "Good to Excellent", reported that they would "do it again", and planned to "continue to garden." When asked to rate, on a scale of 1-10 (1=not at all and 10=very much), the influence of gardening on motivating behavior change, BCS reported that gardening motivated them to... "eat a healthier diet" (M=8.38; SD=2.07), "eat more vegetables" (M=8.43; SD=2.08), and "be more physically active" (M=7.5; SD=2.73).

Conclusions: The vegetable gardening intervention proved to be feasible and provided new knowledge about the influence of gardening on motivating behavior change among BCS. Findings suggest that a mentored home-based vegetable gardening may offer an integrative approach to improve diet, vegetable consumption, and physical activity among BCS. Larger, future studies are warranted.

*Indicates a recipient of a travel scholarship

Abstracts Selected for Oral Presentation

Session 1: Diet, Obesity, Healthy Living Monday, March 12, 1:45-3:15 p.m. (Cont.)

Correlates of physical inactivity and interest in becoming physically active among ethnically diverse rural and urban colorectal cancer survivors in New Mexico

Blair CK, Wiggins C, Rajput A, Chu V, Kinney AY
Presenter: **Cindy Blair**, PhD, MPH, University of New Mexico

PURPOSE: Examine sociodemographic and health correlates of physical inactivity and interest in becoming physically active among rural and urban colorectal cancer (CRC) survivors in New Mexico.

METHODS: Physical activity questions from a mailed survey were completed by 288 CRC survivors (40% Hispanic, 39% rural). Adherence to physical activity guidelines was defined as 150 minutes per week of

moderate- or 75 minutes per week of vigorous-intensity activity. Logistic regression was used to evaluate correlates of guideline adherence and interest in becoming more physically active. Potential correlates

included sociodemographic factors (age, sex, ethnicity, education, income) and indicators of health and well-being (obesity, comorbidities, fatigue, physical function, satisfaction with participation in social

roles/activities, depression, anxiety, and pain).
RESULTS: A similar percentage of rural and urban CRC survivors were non-adherent to physical activity guidelines (55% vs. 50%). The primary correlates of non-adherence among rural CRC survivors were obesity (OR=2.5, 95% CI 1.1-5.7) and lower satisfaction with participation in social roles (OR=4.0, 95% CI 1.6-9.8). For urban CRC survivors, the primary correlates were female gender (OR=2.4, 95% CI 1.3-4.6) and poor physical functioning (OR=3.6, 95% CI 1.8-7.3). Among survivors non-adherent to guidelines, 40% of rural and 44% of urban CRC survivors indicated they would like help with increasing their physical activity. Rural survivors wanting help were more likely to be male (OR=6.5, 95% CI 1.2-34.9), obese (OR=5.4, 95% CI 1.1-27.5), have lower income (OR=5.6, 95% CI 1.1-28.9), or experience anxiety (OR=11.4, 95% CI 2.3-56.7). Urban survivors wanting help with becoming physically active were more likely to experience anxiety (OR=4.6, 95% CI 1.1-19.0), fatigue (OR=6.4, 95% CI 1.9-22.2), or have post-high school education (OR=10.4, 95% CI 1.9-56.2).

CONCLUSION: While the percentages of rural and urban CRC survivors who were physically inactive and interested in becoming more active were similar, the correlates differed. Future interventions to promote physical activity in CRC survivors in New Mexico will need to address socio-demographic, physical and psychosocial health factors affecting this population.

The Impact of Lifestyle Intervention and Metformin on Long-term Reductions in Visceral Fat among Women at High Risk for Endometrial Cancer

Coletta AM, Yates MS, Lu K, Levy E, Soletsky B, Basen-Engquist K
Presenter: **Adriana Coletta**, PhD, RD, University of Texas MD Anderson Cancer Center

Purpose: The strongest link between obesity and cancer exists for endometrial cancer. Obesity increases risk of endometrial cancer through dysregulation of sex hormones and insulin signaling. Excessive accumulation of visceral fat is a major contributor to obesity's role in cancer. The purpose of this investigation was to assess the joint and independent effects of 16 weeks of lifestyle intervention and metformin on sustained changes in visceral fat at 12-month follow-up among women considered at high risk for developing endometrial cancer.

Methods: Obese, postmenopausal women with pre-diabetes were recruited from the community and randomized into four groups for a 16-week intervention using a 2 (metformin 1700 mg/day vs placebo) × 2 (lifestyle- intervention vs no lifestyle-intervention) factorial design. The lifestyle intervention was based on the evidence- based Diabetes Prevention Program (DPP) and consisted of diet and physical activity components. The DPP recommends a low fat diet and portion control to achieve 7% weight-loss. Participants were provided with a pedometer to set daily step goals and monitor step counts, and the opportunity to engage in two supervised exercise sessions per week. Visceral fat area was measured at baseline and 12-month follow-up by whole-body DXA scan. Linear interpolation was used to replace missing values. General linear model with repeated measures was used to assess change in visceral fat area from baseline to 12-months.

Results: At 12-month follow up, a significant time × lifestyle intervention interaction ($p=0.012$) was observed favoring individuals who participated in a 16-week lifestyle intervention ($-26.0 \pm 25.6 \text{ cm}^2$) compared to those who did not ($3.8 \pm 28.3 \text{ cm}^2$). Metformin+lifestyle ($n=7$) experienced most favorable reduction in visceral fat ($-30.4 \pm 24.3 \text{ cm}^2$), followed by lifestyle ($-19.9 \pm 28.9 \text{ cm}^2$, $n=5$), placebo ($-6.6 \pm 17.6 \text{ cm}^2$, $n=7$), and metformin ($14.2 \pm 34.3 \text{ cm}^2$, $n=7$). No significant interactions were observed for time × metformin ($p=0.63$) or time × lifestyle × metformin ($p=0.15$).

Conclusions: A 16-week lifestyle intervention with or without metformin promotes reductions in visceral fat area that are sustained after 12 months among women considered at high risk of developing endometrial cancer.

Abstracts Selected for Oral Presentation

Session 2: Cancer Screening and Surveillance

Monday, March 12, 1:45-3:15 p.m.

Breast density and risk of invasive breast cancer among older women undergoing mammography: The Breast Cancer Surveillance Consortium cohort study

Braithwaite D, Miglioretti DL, Zhu W, Demb J, Trentham-Dietz A, Sprague B, Tice JA, Onega T, Henderson LM, Buist DSM, Walter LC, Kerlikowske K
Presenter: **Adriana Coletta**, PhD, RD, University of Texas MD Anderson Cancer Center

Objective: This study examined whether breast density is associated with risk of breast cancer in women age ≥ 65 years undergoing screening mammography in community practice.

Methods: We used prospective cohort data between 1996 and 2012 from the Breast Cancer Surveillance Consortium (BCSC). We calculated separate cumulative incidence models for breast cancer incidence according to Breast Imaging Reporting and Data System (BI-RADS) breast density for women ages 65-74 and ages ≥ 75 . Multivariable Cox proportional hazards regression models were fitted to determine the risk of invasive breast cancer adjusted for BCSC registry, race/ethnicity, BMI, hormone therapy use and benign breast disease.

Results: Among the 403,268 women included in the study, approximately 40% were ages ≥ 75 . The annual incidence rate of invasive breast cancer increased with increasing breast density among women ages 65-74 [BI-RADS fatty breasts: 2.2% (95% CI, 2.1-2.4%) vs. heterogeneously or extremely dense breasts: 4.7% (95% CI, 4.6-4.9%)] and women ages 75+ [BI-RADS fatty breasts: 2.3% (95% CI, 2.1-2.5%) vs. heterogeneously or extremely dense: 4.3% (95% CI, 4.1-4.5%)]. Women with BI-RADS fatty breasts had a decreased risk of breast cancer among women ages 65-74 [HR: 0.66 (95% CI: 0.58-0.78%) and women ages ≥ 75 [HR: 0.73 (95% CI: 0.62-0.87%)]. Women with BI-RADS heterogeneously or extremely dense breasts were found to have increased risk of breast cancer among women ages 65-74 [HR: 1.39 (95% CI: 1.28-1.51%)] and women ages ≥ 75 [HR: 1.23 (95% CI: 1.10-1.37%)].

Conclusions: Older women with higher BI-RADS density had a significantly increased risk of breast cancer. These findings add further evidence that breast density continues to be associated with an increased risk of breast cancer, even among women age ≥ 75 years.

Prevalence and Characteristics of Liver Fibrosis Detected by Elastography: Results from the Cameron County Hispanic Cohort

Watt GP, Lee M, Pan JJ, Fallon MB, McCormick JP, Fisher-Hoch SP

Presenter: **Gordon Watt**, BA, University of Texas Health Science Center at Houston

Purpose. Mexican Americans in south Texas have among highest rates of hepatocellular carcinoma (HCC) in the US. Non-invasive measures of liver fibrosis are needed to identify those at high risk of HCC. The purpose of the study was to determine the prevalence of and factors associated with liver fibrosis using acoustic radiation force impulse (ARFI) elastography, an accurate and non-invasive modality, in the Cameron County Hispanic Cohort (CCHC).

Methods. The CCHC is a well characterized population-based cohort in south Texas. Liver stiffness was measured by ARFI in 404 participants in the CCHC by two separate operators. Median liver stiffness > 1.34 m/s was considered significant (F2-F4) fibrosis. Ultrasound was used to determine presence of steatosis. Absence of HCV and HBsAg antigen, and absence of heavy drinking, was considered non-alcoholic fatty liver disease (NAFLD). We calculated design-based prevalence of fibrosis and determined clinical associations with (1) significant fibrosis and (2) simple steatosis using multinomial logistic regression.

Results. Mean age was 51.1 years, 44.6% were male, and 29.1% had diabetes. The prevalence of significant fibrosis was 16.5%. In the fibrosis group, most (47/57, 84%) had NAFLD. We excluded participants with etiologies other than NAFLD for further analyses. After adjustment for age and sex, hypertension [Odds Ratio (OR) 3.0, 95% confidence interval (CI) 1.1 – 8.1], platelet count (OR 0.6, 95% CI 0.5 – 1.0), and potassium level (OR 1.5, 95% CI 1.1 – 2.0) were significantly associated with fibrosis, but not steatosis. HDL cholesterol (OR 0.5, 95% CI 0.4 – 0.7), obesity (OR 2.2, 95% CI 1.2 – 4.0) and insulin level (OR 2.1, 95% CI 1.2 – 3.7) were significantly associated with steatosis, but not fibrosis. Elevated fasting glucose, diabetes, and elevated ALT levels were significantly associated with both steatosis and fibrosis. **Conclusion.** This is the first population-based application of liver elastography in the US. We find a high prevalence of fibrosis in Mexican Americans, dominated by NAFLD. Our results indicate a higher burden of fibrosis than population-based studies of liver fibrosis conducted elsewhere. We urge community intervention for the early detection of liver disease and prevention of NAFLD-related HCC.

Abstracts Selected for Oral Presentation

Session 2: Cancer Screening and Surveillance

Monday, March 12, 1:45-3:15 p.m. (Cont.)

Can home-based HPV self-sampling improve cervical cancer screening adherence in underscreened women? Results from the HOME pragmatic randomized trial

Winer RL, Tiro JA, Miglioretti DL, Thayer C, Beatty T, Lin J, Gao H, Buist DSM
Presenter: **Diana Buist**, PhD, MPH, Kaiser Permanente Washington

Background: Home-based HPV self-sampling is an innovative cervical cancer screening strategy that could eliminate clinic-based screening for most women and improve screening compliance by removing some barriers to screening.

Methods: We conducted a pragmatic randomized controlled trial (the HOME Trial) within Kaiser Permanente Washington to compare two programmatic approaches for increasing screening among women aged 30-64 years who were overdue (≥ 3.4 years since last Pap). The control arm included usual care (annual patient reminders and ad hoc outreach by clinics). The intervention arm included usual care plus a mailed HPV self-sampling kit. Women and their healthcare providers were notified of kit results. Providers were responsible for encouraging appropriate follow-up: diagnostic colposcopy if HPV16/18+ and additional in-clinic screening (Pap or co-test) if unsatisfactory or positive for other hrHPV types. If implemented, only HPV-positive women would be triaged to in-clinic screening. In the trial, however, HPV-negative women were still recommended to receive in-clinic screening because home HPV testing is not a guideline-approved screening strategy. Screening uptake was defined as any of the following within 6 months of randomization: 1) in-clinic screening; 2) returning a kit that was HPV-negative or HPV16/18+; or 3) returning a kit that was unsatisfactory or positive for non- HPV16/18 types, followed by in-clinic screening.

Results: From 2014-2016, we randomized 16,242 women (8116 control; 8126 intervention) with a median age of 51 years. Screening uptake was higher in the intervention than control arm (28.1% vs. 19.0%; relative risk=1.48, 95%CI: 1.40-1.57). Within the intervention arm, 12.5% of women returned a kit and 15.8% attended in-clinic screening without returning a kit. 11.2% of kits were positive (3.0% HPV16/18+; 8.2% other hrHPV types).

Conclusions: Mailing HPV kits to under-screened women increased screening compared to usual care alone. Almost half of women who were screened after receiving a mailed HPV kit chose in-clinic screening over self-sampling in a hybrid screening approach. Trial results can inform implementation of primary HPV screening strategies that incorporate home-based self-sampling.

Ethnic Disparities in Gastric Cancer Presentation and Screening Practice in the United States: An Analysis of 1997-2010 SEER-Medicare Data

Florea A, Brown HE, Harris RB, Oren E
Presenter: ***Ana Florea**, MPH, BS, University of Arizona College of Public Health

Purpose: Describe differences in *Helicobacter pylori* (*H. pylori*) screening among a Surveillance, Epidemiology and End Results (SEER)-Medicare elderly population by ethnicity, place of birth, and gastric cancer (GC)-related conditions, as chronic infection with *H. pylori* is the strongest risk factor for distal GC.

Methods: We used the National Cancer Institute's population-based SEER-Medicare cancer database for GC (1997-2010). We extracted demographic, location and disease staging information from the SEER data file, Patient Entitlement and Diagnosis Summary File. We obtained information on frequencies of various GC-related conditions (e.g. peptic ulcer, gastric ulcer, gastritis) and screening (*H. pylori* testing and endoscopy) from inpatient hospital and physician/outpatient services claims.

Results: Data from 34,730 subjects were analyzed. The majority of Asian American/Pacific Islanders (AAPIs), 65.1%, were foreign-born, while majority of Non-Hispanic Whites (NHW), Hispanics and Blacks were US-born (88.7%, 51.3%, and 96.9%, respectively). NHWs were oldest at diagnosis (74.7 y.); Hispanic and Black cases were the youngest (72.4 and 72.9 y., respectively). For NHWs, the most frequently diagnosed GC site was the cardia (36.1%), while for AAPIs, Hispanics and Blacks, the most diagnosed sites were non-cardia ($>80\%$, $P<0.001$). Over 55% of NHW, Hispanic and Black cases were diagnosed at regional or distant stage, while 55% of AAPIs were diagnosed at local or regional stage. Over 57% of all cases had a history of GC-related conditions (AAPIs were highest at 64.1%). However, only 11.2% of total cases showed evidence of *H. pylori* testing. *H. pylori* testing was more frequent for foreign-born than US-born (2-fold increase in proportions) and AAPIs exhibited the highest proportion of *H. pylori* testing (22.6% among those with a GC-related condition).

Conclusions: Screening for *H. pylori* was low for all GC cases, despite race/ethnic groups exhibiting conditions for which *H. pylori* testing is recommended. AAPI GC cases had the highest frequency of *H. pylori* testing with tumors staged locally or regionally; increased testing could lead to earlier stage of tumor at diagnosis. Future studies should investigate why screening rates are low in patients with GC-related conditions.

*Indicates a recipient of a travel award

Abstracts Selected for Oral Presentation

Session 2: Cancer Screening and Surveillance

Monday, March 12, 1:45-3:15 p.m. (Cont.)

Clinical and Psychological Predictors of Switching from Active Surveillance to Active Treatment Among Men with Low-Risk Prostate Cancer: the PREPARE Prospective Cohort Study

Taylor KL, Luta G, Zotou V, Hoffman RM, Lobo T, Davis KM, Potosky AL, Aaronson D, Van Den Eeden S
Presenter: **Kathryn Taylor**, PhD, Georgetown University

Numerous observational studies have assessed the clinical predictors of switching from active surveillance (AS) to active treatment (AT), but few have assessed psychological and decisional predictors. In a prospective, comparative effectiveness cohort study of men newly diagnosed with low-risk PCa, we assessed whether psychological and decisional factors predicted switching to AT after adjusting for clinical factors. We conducted pre-treatment telephone interviews (N=1,139; 69.3% participation) with low-risk PCa patients (PSA<10, Gleason<7) and a follow-up assessment 6-10 months post-diagnosis (N=1057; 93%). Clinical variables were obtained from the medical record. The current analysis included men who were on AS for up to 24 months (N=515), compared to men on AS for >12 months who switched to AT between 12-24 months (N=86). In Cox proportional hazard models, we included 2 time-dependent covariates measured between diagnosis and 24-months post-diagnosis: PSA (<4, 4-9.99, 10+) and Gleason score (<7, 7+, no surveillance biopsy). Baseline covariates included age (X=62.3 (SD=7.0), first degree relative with PCa (25%), number of positive cores (<2 = 75%), urologist initial treatment recommendation (14% AT). Covariates measured at 6 months included prostate-specific anxiety, decisional satisfaction, decisional uncertainty, and preference for shared vs. independent decisions. The fully adjusted model indicated that switching to an active treatment was more likely among those with a PSA>10 (HR 5.6, 2.4-13.1), Gleason 7+ (HR 20.2, 12.2-33.4), and the urologist's initial recommendation of AT (HR 2.1, 1.04-4.2). The psychological variables, preference for making independent treatment decisions (HR 2.7, 1.07-6.9) and concern that disease progression will not be detected (HR 1.5, 0.95-2.4) were independently associated with undergoing AT. After adjusting for clinical evidence of disease progression over the first two years post-diagnosis, men's concerns that disease progression will not be detected and preference for making their own treatment decision each independently predicted undergoing AT. These findings suggest the need to provide information and assistance to men who may be uncertain about remaining on AS, particularly when AS remains clinically indicated.

Cumulative incidence of non-breast cancer mortality and breast cancer risk by comorbidity and age among older women undergoing screening mammography: The Medicare-linked Breast Cancer Surveillance Consortium cohort study

Demb J, Abraham L, Miglioretti DL, Buist DSM, Sprague B, Walter LC, O'Meara ES, Schousboe J, Henderson LM, Kerlikowske K, Braithwaite D
Presenter: ***Joshua Demb**, MPH, University of California, San Francisco

Purpose: Due to an increasing comorbidity burden with aging, the margin of benefit from screening mammography in women ages ≥ 65 is highly variable. This study examined 10-year cumulative risk of non-breast cancer mortality and breast cancer by comorbidity and age in a screening population. Methods: We used prospective cohort data from the Breast Cancer Surveillance Consortium (BCSC), which included 198,362 women ages ≥ 65 years who have undergone at least one screening mammogram. We calculated cumulative incidence of non-breast cancer mortality and risk of breast cancer 10 years following the screening mammogram for women ages 65-74, 75-84 and ≥ 85 years stratified by the Charlson Comorbidity Index (CCI scores 0, 1 and ≥ 2). Results: During a median follow-up time of 8.1 years (interquartile range, 4.6 to 10 years), 34,768 died from non-breast cancer causes and 6,327 women were diagnosed with invasive breast cancer of whom 359 died from breast cancer and 942 from non-breast cancer causes. The 10-year cumulative risk of invasive breast cancer following a screening mammogram did not significantly decrease with elevating CCI score and age for women ages 65-74 [CCI 0=4.0% (95% CI 3.9-4.1%) vs. CCI ≥ 2 =3.8% (95% CI, 3.3-4.3%)], ages 75-84 [CCI 0=3.7% (95% CI, 3.5-3.9%) vs. CCI ≥ 2 =3.4% (95% CI, 2.8-4.0%)], and ages ≥ 85 [CCI 0=2.7%, (95% CI, 2.3-3.2%) vs. CCI ≥ 2 =2.5% (95% CI, 1.4-3.6%)]. Cumulative risk of non-breast cancer mortality significantly increased with increasing CCI and age for women ages 65-74 [CCI 0=11% (95% CI, 10-11%) vs. CCI ≥ 2 =45% (95% CI [43-46%]), ages 75-84 [CCI 0=29% (95% CI, 29-30%) vs. CCI ≥ 2 =62% (95% CI, 60-63%)], and ages ≥ 85 [CCI 0=59%, (95% CI, 57-60%) vs. CCI ≥ 2 =84% (95% CI, 81-86%)]. Conclusion: Risk of non-breast cancer mortality was high and significantly increased with rising comorbidity burden and age whereas breast cancer risk was low and non-significantly decreased with both. These results suggest that women with a CCI score of ≥ 2 or ages ≥ 75 years may experience minimal benefit from continuing routine screening mammography. Future research is needed to delineate the specific benefits and harms of screening mammography in subsets of older women defined by age and comorbidity burden.

*Indicates a recipient of a travel award

Abstracts Selected for Oral Presentation

Session 3: Health Disparities in Cancer Prevention

Tuesday, March 13, 12:45-2:15 p.m.

Empowering Latinas to Obtain Breast Cancer Screenings: Comparing Intervention Effects, Part 2

Molina Y, San Miguel LG, Tamayo L, Sanchez-Diaz C, Robledo C, Peña K, Lucio A, Hernandez O, Arroyo J, Medina M, Coronado N, Irma V

Presenter: *Yamile Molina, MS, PhD, MPH, University of Illinois at Chicago

Purpose: We compare the effects of breast cancer education and empowerment approaches on non-adherent Latinas' breast health behaviors and dissemination of health information.

Methods: The setting for this ongoing, quasi-experimental trial is two Latino, lower income communities in Chicago. Women were recruited via two community-based organizations and snowball sampling. Eligibility criteria were: 1) age of 52-74; 2) lack of screening within past 2 years; 3) no previous breast cancer diagnosis; and, 4) no health volunteerism experience. Women were assigned to a three week group intervention (3 2 hour sessions). The education intervention is administered in East Side/South Chicago and the empowerment intervention is administered in Pilsen/Little Village to avoid contamination effects. The education intervention has 3 sessions focused on early detection and prevention (diet, physical activity). The empowerment intervention has 3 sessions focused on early detection, sharing information with family/friends, and health volunteerism. Navigation is provided if women wish to obtain mammograms. Three questionnaires are given at baseline, post-intervention, and a 6 month follow-up.

Results: Among our 68 participants (34 education; 34 empowerment), 87% were born in Mexico; 59% had <9th grade education; 52% had a median household income of <\$10K; and, 51% were uninsured. The average age was 61.21 (SD= 6.20). Relative to education participants, more empowerment participants have scheduled mammograms (94% vs. 74%; $p=.05$) and obtained mammograms (77% vs 38%, $p = .001$). Empowerment participant also spoke to more individuals about breast health relative to education participants ($M=6.24$, $SD = 5.30$ vs $M=3.00$, $SD = 3.04$, $p = .003$). A greater proportion of empowerment participants also spoke about specific types of breast cancer screening (58% vs 38%, $p = .01$) and discussed breast cancer across multiple settings (58% vs 24%, $p = .003$).

Discussion: The empowerment approach may be particularly effective in changing non-adherent Latinas' screening behaviors and promoting them to become agents of change in their communities. Limitations concern generalizability due a non-probability based sample, and limited ability for causal inferences due to a lack of randomization.

Using Social Media to Reduce Multiple Risk Factors for CRC in Rural Appalachians: #CRCFREE

Voigts K, Adegboyega A, Hatcher J

Presenter: Kaitlin Voigts, RN, BSN, University of Kentucky College of Nursing

PURPOSE: To examine the efficacy, acceptability, feasibility, and applicability of a Facebook (FB) intervention designed to reduce multiple colorectal cancer (CRC) risk factors in older adults residing in rural Appalachian Kentucky.

METHODS: We piloted a 12 week FB intervention culturally tailored for older adults residing in rural Eastern Kentucky to impact CRC risk factors, including: nutrition, physical activity, and screening. Participants were aged 50+, had internet access, and were at risk for CRC. During the 12 week study, the participants received three daily posts via secret FB group regarding CRC risk factors. Demographics, dietary measures, body mass index (BMI), and CRC screening were assessed at baseline and post intervention. FB engagement and physical activity were tracked throughout the intervention. Dietary measures included the Healthy Eating Index (HEI) and Dietary Inflammatory Index (DII). Physical activity was tracked using Fitbits. Post-intervention focus group interviews were conducted to assess feasibility and acceptability.

RESULTS: Participants ($n=57$) were Caucasian, aged 58 ± 6 years, predominately female (67%), and the majority reported at least a high school education (77%). Post intervention, participants experienced significant increase in HEI scores (49.94 ± 9.84 vs. 58.60 ± 12.06 , $p = <0.01$). DII scores significantly decreased (2.44 ± 1.12 vs 1.60 ± 1.63 , $p=0.003$). There was no significant change in physical activity, BMI, or screening status. Participants, on average, viewed more than half of the posts. Focus group participants found FB posts to be useful and motivating. They reported that FB posts were educational and motivational.

CONCLUSION: This pilot study shows promising preliminary data to support using a FB intervention in rural Appalachian older adults to decrease CRC risks. Participants were receptive to FB intervention, and FB provides a unique and accessible method for health promotion in hard to reach populations.

*Indicates a recipient of a travel award

Abstracts Selected for Oral Presentation

Session 3: Health Disparities in Cancer Prevention

Tuesday, March 13, 12:45-2:15 p.m.

Race, Ethnicity, Socioeconomic Status and Site-specific Risk for Gastric Cancer

Martinez ME, Tao L, Murphy J, Camargo MC, Oren E, Valasek M, Gomez SL, Gupta S

Presenter: **Maria Elena Martinez**, PhD, University of California, San Diego

Purpose of Study: Differences in gastric cancer risk by race/ethnicity have been reported but data on risk by anatomic subsite are lacking. We assessed site-specific differences in gastric cancer risk according to race/ethnicity and socioeconomic status.

Methods: Participants included incident cases of gastric adenocarcinoma age >18 years in the Surveillance Epidemiology and End Results Program 2000-2014. Primary outcome was risk for incident gastric cancer, overall, and by anatomic subsite (cardia vs. non-cardia). Age-adjusted incidence rates were used to estimate adjusted incidence rate ratios (IRR) and their 95% confidence intervals (CI). Risk was assessed by race/ethnicity and neighborhood socioeconomic status (nSES).

Results: We identified 77,881 cases of incident gastric cancer (n=23,651 cardia; n=35,825 non-cardia; n=18,405 other). For all gastric cancers, adjusted IRRs (95% CI) were higher for blacks [1.72 (95% CI: 1.68-1.76)], Hispanics [1.77 (1.73-1.80)], and Asian/Pacific Islanders [2.12 (2.08-2.17)] compared to non-Hispanic whites. Opposite trends in risk for cardia vs. non-cardia cancer by race/ethnicity were observed. Compared to non-Hispanic whites, cardia IRRs (95% CI) were 0.55 (0.52-0.59) for blacks, 0.63 (0.60-0.66) for Hispanics, and 0.59 (0.56-0.62) for Asians/Pacific Islanders. Non-cardia IRRs (95% CI) were 2.78 (2.69-2.87) for blacks, 2.83 (2.75-2.91) for Hispanics, and 3.86 (3.75-3.97) for Asians/Pacific Islanders relative to non-Hispanic whites. Increasing risk with decreasing nSES was observed for all gastric cancers (p trend <0.0001), with moderate variation for non-cardia cancer but no substantial variation observed for cardia cancer.

Conclusions: Gastric cancer incidence varies substantially by race/ethnicity and nSES, but with markedly different associations by anatomic subsite. Non-cardia cancer risk is higher among minorities than non-Hispanic whites and varies only moderately by nSES; while cardia cancer risk is lower among minorities and does not vary by nSES. Unique opportunities for addressing disparities exist for cardia and non-cardia gastric cancer.

Financial Incentives and Proactive Calling for Promoting Tobacco Treatment Engagement in a Low-income Population: A Factorial Randomized Trial

Kelly D. Hughes, Michael J. Parks, Paula A. Keller, Randi B. Lachter, Christina L. Nelson, Jonathan S. Slater

Presenter: **Kelly Hughes**, PhD, Minnesota Department of Health

The tobacco epidemic disproportionately affects low-socioeconomic populations. Improved strategies to engage low-income smokers in tobacco treatment are needed, particularly scalable interventions.

Purpose: We tested a tobacco treatment engagement intervention for low-income smokers. Using a factorial design, individuals were randomized to financial incentive (\$0 vs. \$10 vs. \$20) and proactive call (no call vs. call) conditions (six conditions). All individuals received direct mail and could opt for cessation support through QUITPLAN® Services, Minnesota's population-based cessation services.

Methods: The intervention was implemented through "Sage," Minnesota's National Breast and Cervical Cancer Early Detection Program (NBCCEDP). Sage provides cancer early detection services to low-income individuals experiencing health disparities. Sage data captured smoking status and demographics; primary engagement outcome was confirmed connection to QUITPLAN Services through Sage's call center. Participants were smokers identified in Sage's database from 2013 to 2016 with confirmed addresses (N=3,365). Logistic regression was used to examine (1) the direct effect of financial incentives and of proactive calls, and (2) the interaction between incentive levels and proactive calls. Cost effective analysis was also completed.

Results: Groups that received \$10 or \$20 incentives had higher odds of treatment engagement compared to groups that received no incentive [respectively, OR=1.97; 95% CI (1.21–3.23); OR=2.06; 95% CI (1.26–3.35)]. Also, groups that received a proactive call had higher odds of treatment engagement compared to groups not called [OR=1.50; 95% CI (1.04–2.17)]. Compared to the no-incentive, no-call group, the \$20 incentive, call group had the highest odds of treatment engagement [OR=4.29; 95% CI (1.86–9.87)]. The \$10 incentive groups were the most cost effective.

Conclusion: Direct mail with small incentives or proactive calling can successfully encourage low-income smokers to engage in tobacco treatment through population-based cessation programs. Other NBCCEDPs could consider implementing similar approaches to help reduce tobacco-related disparities

Abstracts Selected for Oral Presentation

Session 3: Health Disparities in Cancer Prevention

Tuesday, March 13, 12:45-2:15 p.m.

Mortality disparities after adolescent and young adult cancer

Anderson C, Smitherman AB, Nichols HB

Presenter: **Chelsea Anderson**, MPH, University of North Carolina

Adolescent and young adult (AYA) cancer patients may have unique mortality risk profiles compared to younger or older cancer patients. In addition to potential differences in tumor biology and treatment efficacy, AYAs often have unstable insurance coverage. With data from an existing study of 17,399 women with an incident, invasive cancer diagnosis at ages 15-39 in North Carolina during 2000-2013, we defined cancer deaths using ICD-10 codes for malignant neoplasms (C00-C97), and all other causes of death as noncancer deaths. Person-years were accrued from cancer diagnosis until death or December 31, 2014, whichever occurred first. We estimated 10-year cumulative incidence of cancer and noncancer death, accounting for the other as competing risks. Multivariable hazard ratios (HR) and 95% confidence intervals (CI) for cause-specific death were estimated using Cox proportional hazards regression models and were adjusted for cancer type, race (white, black, other), insurance status at diagnosis (private/military, Medicaid, other public insurance [Medicare or Indian/Public Health Service], uninsured, unknown), and age at diagnosis. During follow-up, there were 2,620 deaths due to cancer and 349 deaths from noncancer causes. Across cancer types, the 10-year cumulative incidence of cancer and noncancer death, respectively, were 23% and 2% for breast cancer, 6% and 2% for Hodgkin lymphoma, 5% and 0% for melanoma, 13% and 9% for non-Hodgkin lymphoma, 0% and 1% for thyroid cancer, 13% and 2% for gynecologic malignancies, and 32% and 4% for all other cancer types combined. Cancer and non-cancer mortality risks were higher among Blacks than Whites (HR=1.5; CI: 1.3-1.6 and HR=1.6; CI: 1.3-2.0, respectively). Compared to AYAs with private or military insurance at diagnosis, mortality was elevated for those with Medicaid (HR=1.8; CI: 1.6-2.0 and HR=2.9; CI: 2.2-3.9) and other public insurance (HR=1.8; CI: 1.5-2.2 and HR=6.6; CI: 4.6-9.5), but not for those who were uninsured (HR=1.1; CI: 1.0-1.3 and HR=1.1; CI: 0.7-1.9). Our findings highlight disparities according to race and insurance status among AYAs with cancer and the need for strategies to reduce mortality in vulnerable groups.

Neighborhood and Individual Social Barriers to Care-Seeking for Ovarian Cancer Symptoms in African American Women

Mullins M, Cote ML, Abbott S, Alberg AJ, Bandera EV, Barnholtz-Sloan JS, Bondy M, Camacho F, Funkhouser E, Moorman PG, Peres LC, Schwartz AG, Terry PD, Wang F, Schildkraut JM, Peters ES

Presenter: **Megan Mullins**, MPH, University of Michigan School of Public Health

Ovarian cancer is the most deadly gynecologic cancer, and survival is poorer among African American women. Delay in diagnosis and treatment may contribute to this disparity, but existing work has only examined financial barriers to care. We examined social barriers (mean everyday discrimination and trust in physician scores) on the individual and neighborhood level as they relate to delay in care-seeking among 548 African American women with ovarian cancer enrolled in the multisite case control African American Cancer Epidemiology Study (AACES). The outcome was defined as having above average symptom duration, at least eight months, in the year prior to diagnosis. Models were adjusted for age at diagnosis, marital status, body mass index, Charlson co-morbidity score, education, and income. Access to care variables included insurance, regular physician relationship, primary care provider density within a census tract, and self-reported barriers to accessing healthcare. Census-tract level affluence and disadvantage factors derived from neighborhood socioeconomic characteristics (% poverty, median home value, etc.) were hypothesized to be effect modifiers of discrimination. In our analysis, 41% (n=225) of women reported at least one symptom for eight months prior to diagnosis. After adjustment for confounders, a one-unit increase in frequency of mean everyday discrimination was associated with 1.89 times the odds of care seeking delay (OR 1.89 CI 1.37-2.62) for women with average neighborhood affluence and disadvantage. One standard deviation increase in neighborhood disadvantage was associated with 81% higher odds of care delay due to discrimination (OR 1.81 CI 1.10-2.98). Similarly, higher neighborhood affluence was associated with 73% higher odds of care delay due to discrimination (OR 1.73 CI 1.01-2.99). Longer symptom duration was not associated with trust in physicians or not having a physician, type of insurance coverage or lapse in insurance coverage, barriers to care, education, or income. The association of perceived discrimination and longer symptom duration among African American women with ovarian cancer suggests, at both the individual and neighborhood levels, social barriers to care are an important area for further research.

Abstracts Selected for Oral Presentation

Session 4: Molecular Epidemiology and the Environment

Tuesday, March 13, 12:45-2:15 p.m.

Phthalate metabolites and postmenopausal breast cancer risk

Reeves KW, Diaz Santana M, Hankinson SE, Bigelow C, Zoeller RT, Manson J, Spiegelman D, Tinker L
Presenter: **Katherine Reeves**, PhD, MPH, University of Massachusetts Amherst

Background Mounting laboratory and animal model evidence supports the potentially carcinogenic effects of phthalates, chemicals used as plasticizers in a wide variety of consumer products (e.g. cosmetics, medications, vinyl flooring). Phthalate metabolites (PMs) are measurable in nearly 100% of the U.S. population, though levels vary widely, and also have been reported in human breast milk. However, prospective data on whether phthalates affect human breast cancer risk is lacking. Methods We conducted a nested case-control study within the Women's Health Initiative (WHI) prospective cohort (N=419 invasive cases and 838 matched controls). Controls were matched 2:1 on age, enrollment date, follow-up time, and study group (WHI clinical trial or observational study). We measured a panel of thirteen PMs and creatinine in two or three urine samples per participant over 1 to 3 years. Multivariable conditional logistic regression analysis was used to estimate risk ratios and 95% confidence intervals (RR, 95% CI) for breast cancer risk associated with each PM, with incorporation of measurement error correction approaches to account for the moderate within-participant variability of PMs. Results Overall, we did not observe statistically significant associations between individual PMs and breast cancer risk in analyses adjusted for matching factors, creatinine, body mass index, smoking status, and race/ethnicity: e.g., mono-2-ethylhexyl phthalate (MEHP; p trend=0.31; e.g. RR 0.91, 95% CI 0.62-1.33), monoethyl phthalate (MEP; p trend=0.16; e.g. RR 0.80, 95% CI 0.55-1.16 for 4th quartile vs 1st quartile), monohydroxy-isobutyl phthalate (MHBP; p trend=0.11; e.g. RR 0.78, 95% CI 0.51-1.18 for 4th quartile vs 1st quartile, and monobenzyl phthalate (MBzP; p trend=0.11; e.g.. RR 0.86, 95% CI 0.57-1.28 for 4th quartile vs 1st quartile). Conclusions These results indicate that urinary phthalate metabolite levels are not related to increased breast cancer risk. However, some phthalate metabolites may be associated with decreased risk, possibly through anti-estrogenic actions. Future analyses will explore grouping metabolites by parent phthalate and also will separately evaluate breast cancer risk by tumor estrogen receptor status and explore potential effect modification by

Family History of Melanoma and Lifetime Patterns of Daytime Hours Spent Outdoors in Melanoma-prone Families

Duan C, Qian L, Mitra N, Kanetsky PA on behalf of the GenoMEL
Presenter: ***Chunzhe Duan**, PhD, Moffitt Cancer Center

Purposes: Longer daytime hours spent outdoors reflect higher ultraviolet radiation exposure, which is a modifiable risk factor of melanoma. Among individuals of melanoma-prone families, we sought to describe lifetime patterns for hours spent outdoors, and to investigate whether having an affected family member with melanoma from an older generation was associated with patterning.

Methods: Information on hours spent outdoors on weekdays, weekends, and holidays beginning at age 10 was obtained from individuals from melanoma-prone families. We determined time-weighted average hours outdoors for warmer months, colder months, and the entire year. K-means for longitudinal data was used to identify lifetime patterns. We created a variable to indicate whether there was an existing melanoma in a prior generation of an individual's family. Multinomial logistic regression models were used to examine the association between family history of melanoma and lifetime patterns of daytime hours spent outdoors, adjusting for covariates.

Results: We analyzed 2540 individuals from 669 families ascertained across 15 countries, and four lifetime patterns were identified. Three patterns began with moderate hours that (B) decreased slowly (n=1014); (C) decreased sharply until age 20 and then remained low (n=572); or (D) increased at age 20 and remained high (n=173). One pattern, (A) began with few hours that decreased at age 20 then remained very low (n=781). Compared to individuals with the high (D) pattern, individuals with an existing melanoma in a prior family generation were more likely to have the low (A) pattern (OR=1.92, 95% CI: 1.34 – 2.76), the moderate and slowly decreasing (B) pattern (OR=1.72, 95% CI: 1.15 – 2.57), or the sharply decreasing (C) pattern (OR=2.01, 95% CI: 1.40 – 2.87). Similar associations were observed separately in warmer and colder months. Examining lifetime patterns of hours spent outdoors during holidays, we noticed a stronger relationship with family history of melanoma in warmer months than in colder months.

Conclusions: As expected, the diagnosis of a melanoma in a prior generation may impact family members' awareness of UVR exposure leading to reduced daytime hours spent outdoors.

*Indicates a recipient of a travel award

Abstracts Selected for Oral Presentation

Session 4: Molecular Epidemiology and the Environment

Tuesday, March 13, 12:45-2:15 p.m.

Genetic Associations with Indoor Tanning Addiction

Mays D, Ahn J, Zhang B, Atkins MB, Goerlitz D, Tercyak KP

Presenter: **Darren Mays**, PhD, MPH, Lombardi Comprehensive Cancer Center

Purpose: Some young people are prone to develop addiction to indoor tanning along with psychiatric comorbidity. This study examined genetic hypotheses that liabilities in neurobiological addiction reward pathways influence risk of indoor tanning addiction and are affected by psychiatric comorbidity.

Methods: Data were from an observational study investigating factors associated with indoor tanning addiction in a community sample of non-Hispanic white women ages 18-30 years with a history of indoor tanning in the past year. A total of 295 participants completed self-report measures and provided DNA samples. DNA samples were genotyped and analyzed for 36 single nucleotide polymorphisms (SNPs) in candidate genes involved in hypothesized addiction reward pathways (e.g., opioid and dopamine receptor genes). Self-report measures included indoor tanning frequency and dependence symptoms, appearance beliefs, and depressive symptoms.

Results: Over 20% of the sample screened positive for indoor tanning addiction. Two SNPs in the DRD2 dopamine receptor gene, rs4436578 and rs4648318, were significantly associated ($p < .05$) with indoor tanning addiction after multiple testing adjustment using the false discovery rate. In logistic regression analyses adjusting for indoor tanning frequency, appearance beliefs, and depressive symptoms, homozygous major allele genotypes for both SNPs were associated with indoor tanning addiction (Odds Ratio [OR] 2.29, 95% Confidence Interval [CI] 1.11-4.77, and OR 1.95, 95% CI 1.02-3.72, respectively). The major allele genotypes for both SNPs also interacted with depressive symptoms to influence the risk of indoor tanning addiction: OR 7.03, 95% CI 3.26-15.19, OR 4.35, 95% CI 2.06-9.20, respectively.

Conclusions: This study is among the first to demonstrate SNPs in the DRD2 dopamine receptor gene are associated with indoor tanning addiction. Our findings demonstrate young women with risk-conferring genotypes and exhibiting depressive symptoms are at especially high risk. These data can inform personalized interventions tailored to neurobiological and behavioral differences to prevent melanoma and non-melanoma skin cancer.

Commercially Available Lifestyle Modification Program Decreases Inflammatory Biomarkers in BRCA1/2+ Breast Cancer Survivors

Sturgeon KM., Foo W, Schmitz KH

Presenter: **Kathleen Sturgeon**, PhD, MTR, Penn State University

The goal of this randomized controlled trial was to examine the effect of a 12-month commercially available web-based lifestyle program (Precision Nutrition (PN), Inc®) on biomarkers of inflammation, compared to usual care among a national cohort of 35 BRCA1/2+ breast cancer survivors with surgically-induced early menopause. The PN program included access to a PN coach and completion of three daily activities: 1) exercises; 2) completing a nutritional/lifestyle habit, and 3) reading health related material. The exercise component was completed at home or at a local gym, and required 160 min/wk of exercise (3 days/week of progressive resistance exercise, 2 days/week of interval aerobic exercise, and 1 day/week of active recovery aerobic exercise). Blood draws, body composition measurements, and fitness capacity were measured at baseline and follow up. The cohort was middle-aged (46.1 ± 4.0 years of age), white, and well-educated. The intervention group ($n=19$) was 74.8% adherent to the program (average of all components: fitness, behavioral, education). At baseline, higher insulin levels were associated with higher TNF α levels ($r=0.38$, $p=0.04$). Higher BMI as well as higher % body fat levels were significantly associated with higher levels of: insulin, IL6, and TNF α . There was a trend for association between lower fitness levels and higher insulin levels ($r=-0.33$, $p=0.07$), and a significant association between lower fitness levels and higher IL6 and TNF α level. Following 12 months of the PN program we did not observe any significant between group differences for change in biomarker levels. Within the control group, IL8 levels decreased ($p=0.04$). Within the intervention group, we observed decreased levels of insulin ($p=0.06$), and TNF α ($p=0.02$). In conclusion, we observed elevation of pro-inflammatory biomarkers in BRCA1/2+ breast cancer survivors with excess body fat and low fitness at baseline. Following the intervention, levels of pro-inflammatory cytokine TNF α were significantly reduced. BRCA1/2+ breast cancer survivors with prophylactic oophorectomy are still at enhanced risk for non-reproductive cancers. In this high risk population, identifying interventions such as PN to decrease chronic inflammation and subsequent DNA damage is critically important.

Abstracts Selected for Oral Presentation

Session 4: Molecular Epidemiology and the Environment

Tuesday, March 13, 12:45-2:15 p.m.

Interactive Effects of Obesity and Androgen Receptor Polymorphisms on Prostate Cancer Outcomes

Zeigler-Johnson CM, Dabbish N, Keith SW
Presenter: **Darren Mays**, PhD, MPH, Thomas Jefferson University

Purpose: Obesity and the androgen receptor (AR) gene have been implicated as drivers in the progression of prostate cancer (PCa). The goal of this study was to examine the interactive effects of obesity and AR on PCa outcomes.

Methods: Our sample included 1486 PCa patients. Obesity was defined as body mass index ≥ 30 kg/m². We studied key polymorphisms in AR activation: CAG (≥ 21 vs. < 21 repeats) and GGC (< 17 vs. ≥ 17 repeats). High tumor stage was defined as T3/T4. High tumor grade was defined Gleason score ≥ 7 . Biochemical failure was defined as PSA ≥ 0.2 ng/ml after definitive treatment. We fit independent logistic regression models for each genotype adjusted for age and race on tumor stage and grade. Cox regression models were used to evaluate time-to-biochemical failure adjusted for age, race and grade. A p-value < 0.05 was considered significant.

Results: The median age of the sample was 60 and median BMI was 28. Twenty-two percent of the sample was African American. Thirty-five percent of the sample carried < 21 CAG repeats and 80% carried ≥ 17 GGC repeats on AR. The prevalence of advanced tumor stage was 28%, advanced tumor grade was 46%, and biochemical recurrence was 19% with a median follow-up time of 34 months. There were no significant interactions between genotype and obese status in modelling tumor grade. However, multivariable analyses suggested that obesity and AR GGC ≥ 17 repeats associations were not additive in predicting advanced stage PCa at diagnosis (interaction OR=0.34, p=0.025) and that, compared to non-obese men with < 17 AR GGC repeats, obese men with < 17 AR GGC repeats experienced about a 3-fold increase in odds of advanced stage PCa (OR = 3.22, 95% CI=1.36-7.61). Also, obesity and AR CAG < 21 repeats associations were not additive in predicting biochemical failure risk (interaction HR=2.20, p=0.049). Compared to non-obese men with ≥ 21 AR CAG repeats, non-obese men with < 21 AR CAG repeats experienced about a 34% reduction in risk of biochemical failure (HR = 0.66, 95% CI=0.43-1.00).

Conclusions: We observed interactions between obesity and AR related to PCa progression. It appears that associations between PCa outcomes and AR are contingent upon patient obesity status.

Urinary metabolites of environmental phenols and breast cancer incidence: the Long Island Breast Cancer Study Project

Parada H Jr, Gammon MD, Chen J, Calafat AM, Neugut AI, Santella RM, Wolff MS, Teitelbaum SL
Presenter: **Humberto Parada**, PhD, San Diego State University

Background: Select environmental phenols, compounds used widely in personal care and consumer products, are known endocrine disruptors. However, no epidemiologic studies have objectively examined whether phenols are associated with breast cancer. **Purpose:** To examine seven urinary phenol biomarkers (2,5-dichlorophenol, benzophenone-3, bisphenol A (BPA), methyl-, propyl-, butyl-paraben, and triclosan) in association with breast cancer, and to examine effect modification by body mass index (BMI) given that adipose tissue is a source of estrogens, and phenols are lipophilic.

Methods: Participants were a subsample of women (711 cases and 598 controls) from a population-based study of breast cancer. Urinary phenol biomarkers were measured in spot samples collected on average within three months of a first diagnosis of primary in situ or invasive breast cancer in 1996/1997. We used logistic regression to estimate covariate-adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for creatinine-corrected phenol concentrations.

Results: Among all women, the highest (vs lowest) quintiles of methyl- and propyl-paraben were associated with 52% (OR=1.52, 95% CI=1.02-2.27) and 38% (OR=1.38, 95% CI=.93-2.07) increased odds, respectively, of breast cancer. A ln-unit increase in propyl-paraben was associated with a 15% increase (OR=1.15, 95% CI=1.04-1.28) in breast cancer odds among women with BMI <25.0 kg/m², but not among women with BMI ≥ 25.0 kg/m² (OR=.99, 95% CI=.91-1.09) (Pinteraction=0.02). There was a suggestion of effect modification by BMI for methyl-paraben (Pinteraction=0.12) and BPA (Pinteraction=0.11). Ln-transformed continuous concentrations of methyl-paraben positively associated with breast cancer among women with BMI <25.0 kg/m² (OR=1.15, 95% CI=1.01-1.32), but not among women with BMI ≥ 25.0 kg/m² (OR=1.02, 95% CI=.91-1.14). Ln-transformed continuous concentrations of BPA were inversely associated with breast cancer among women with BMI <25.0 kg/m² (OR=.78, 95% CI=.64-.95), but not among women with BMI ≥ 25.0 kg/m² (OR=1.01, 95% CI=.84-1.22).

Conclusions: Exposure to select phenols may increase breast cancer risk; however, because of potential for reverse causation in this case-control study, future studies should examine these associations prospectively.

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1-T

Wearable Electronic Activity Monitors Produced Greater Self-Regulation and Psychological Need Satisfaction than Pedometers in a Randomized Trial

Bentley JR, Lewis ZH, Swartz MC, Lyons EJ

BACKGROUND: Increasing physical activity (PA) is associated with decreased risk of multiple cancers, but unfortunately rates of PA are low among American adults. Behavioral interventions have demonstrated that targeting self-regulation and psychological need satisfaction can improve PA. Electronic activity monitors (EAMs) are a potential medium for delivering intervention components, but the extent to which they successfully target these theoretical constructs is unclear. The purpose of this study was to compare impacts on self-regulation and psychological need satisfaction between EAMs and standard pedometers in the context of a low-intensity behavioral intervention.

METHODS: As secondary outcomes of a pilot randomized controlled trial, 40 primary care patients (mean age = 61.5 ± 5.3 years, 85% female, 65% white, BMI 30.3 ± 3.1) completed the Exercise Goal-Setting Scale, Exercise Planning and Scheduling Scale, and the Psychological Need Satisfaction in Exercise Scale. Participants were then randomized to either a pedometer (PM) group or an EAM (Jawbone UP24) group to monitor activity over 12 weeks. Both groups were reassessed at the end of the 12 week period.

RESULTS: ANCOVA controlling for demographic and baseline levels of the outcome revealed that participants in the EAM group were significantly more likely to set exercise goals (EAM: 31.0 vs. PM: 22.34; $P < .0001$), schedule and plan their exercise (EAM: 26.4 vs. PM: 20.45; $P < .05$) and feel competent (EAM: 3.42 vs. PM: 2.49; $P < .001$), autonomous (EAM: 4.01 vs. PM: 3.16; $P < .001$) and related to others (EAM: 3.94 vs. PM: 3.23; $P < .01$) when exercising relative to those in the pedometer group.

CONCLUSIONS: Our findings suggest that, compared to a standard pedometer, an EAM intervention improves goal behaviors as well as satisfies the basic psychological needs of competence, autonomy and relatedness. A PA intervention that addresses these psychological outcomes may be imperative to PA behavior maintenance and thus may function as an EAM intervention mechanism targeting PA and weight outcomes. A study with a longer follow-up period is needed to examine prospective associations between psychological factors and exercise behavior maintenance.

2

Examination of the effectiveness of a program to increase HPV vaccination among 9-17 year old children attending pediatric clinics in Southeast Texas

Berenson AB, Hirth JM, Rupp RE, Kuo YF

Purpose: To determine the effectiveness of a multi-component program which removed cost and educational barriers from parents of patients not fully vaccinated for human papillomavirus (HPV) attending a pediatric clinic.

Methods: Parents of 9-17 year old patients attending a participating clinic between February 1, 2015 and August 31, 2016 who had no previous records of HPV vaccination were approached as part of a program aimed at increasing vaccination rates. Data for these patients was followed through August 31, 2017. Parents of patients were offered information about the HPV vaccine, and were made aware that the vaccines would be free to their children. Parents who chose to get their children vaccinated then had follow-up appointments for 2nd and 3rd shots scheduled before they left. Reminders for future appointments were sent via mail, automated phone calls, personal phone calls, and text messages. Patient records were examined to determine initiation and completion rates among families that were approached.

Results: In total, 2,165 age-eligible patients and their parents were approached. Of these, 57 had already completed the HPV vaccine series and 3 were not eligible. Of those who had not received any doses of the HPV vaccine, 930 (66%) received the 1st dose after being counseled, which was a marked improvement from less than 20% of pediatric patients who had initiated the vaccine before the program. Of the 420 initiators, 93% successfully completed the series. Among patients who had initiated the series, 90% received the 2nd dose and 82% completed the series with either the 2nd or 3rd doses. Among 282 patients who had received 2 previous doses, 100% either completed with the 3rd dose, or had received 2 appropriately spaced doses if they were 14 years old or less.

Conclusions: A multi-component program which screened patients for HPV vaccination eligibility, offered parents information, scheduled future vaccinations, and sent reminders was highly effective at increasing HPV vaccination.

Poster Session Abstracts

3-T

The interaction of perceived risk and benefits in predicting mammography adherence

Biederman E.B and Champion V.L.

Purpose. The purpose of this study was to test the interaction of perceived risk and benefits scales on stage of readiness and mammography adherence 6 months post-intervention and whether sociodemographic variables related to the risk/benefits categories.

Methods. Women aged 50-74 years (n=632) from Midwestern primary care clinics were enrolled in a randomized intervention study designed to increase mammography adherence. Data for this secondary analysis were collected 6 months post-intervention using a web-based survey. Four categories (low risk/low benefits, low risk/high benefits, high risk/low benefits, high risk/high benefits) were created to measure the relationship between the risk/benefits categories on mammography adherence, stage of readiness, income, education, family history of cancer, body mass index (BMI), and smoking status.

Results. The highest rate of mammography adherence was in women with low risk/high benefits (43.8%) compared to the lowest rate of adherence in high risk/low benefits (11.1%). Differences in mammography adherence ($p=.000$) and stage of readiness ($p=.000$) between the 4 categories were significant. Women in the low risk/low benefits (50%) and high risk/low benefits (26.3%) categories were most likely to be in Precontemplation. Women in the low risk/high benefits (43.8%) and high risk/high benefits (19.3%) were most likely to be in Action. The risk/benefit categories differed significantly on smoking status ($p=.009$) and family history of cancer ($p=.000$). Smokers (47.8%) and women with a family history of cancer (53.3%) were most likely to be in the high benefits/low risk category.

Conclusions. Perceived benefits was important for whether women obtained mammograms, and future interventions should target perceived benefits to increase mammography adherence and move stage of readiness. Surprisingly, women with high perceived benefits and low perceived risk compared to high risk were more likely to be adherent and in Action, which may reflect that a moderate level of risk moves women to Action. Those who are smokers and with a family history of cancer may overestimate the benefits of mammography and underestimate their personal risk.

4

Discussing sexual health concerns after primary cancer treatment: Breast cancer survivor, romantic partner, and health care provider perspectives on the triadic interaction

Canzona, M; Fisher, CL; Ledford, CJW; Garcia, D; Kalish, VB; Raleigh, M

Purpose: To investigate breast cancer survivor (BCS), romantic partner, and healthcare provider (HP) perceptions of romantic partners' involvement in patient-provider conversations regarding sexual health (SH) concerns after primary cancer treatment.

Methods: Forty female BCSs, 13 partners, and 40 HPs from a range of specialties participated in semi-structured interviews. Transcripts were thematically analyzed. BCS, partner, and HP accounts were compared to identify similarities and discrepancies, which could inform efforts to enhance care.

Results: BCSs, partners, and HPs reported that including partners is helpful because their presence serves as a memory aid and helps facilitate partners' understanding of women's experiences. BCSs further reported partners' presence can help the couple discuss delicate matters in a "neutral and safe environment." BCSs, partners, and HPs reported that including partners is problematic when their presence threatens women's privacy or when discussing physical aspects of sexual functioning makes women or partners uncomfortable. Women reported additional concerns regarding the presence of partners. They suggested discussing this issue in front of partners changes the way partners view them as women, places unnecessary burden on partners, provokes partner defensiveness, and leads to feelings of exclusion when HPs begin talking only to partners. Partners reported that in many cases they do not wish to be involved in SH discussions. Being compelled to can make them feel reprimanded, resulting in active resistance to communication attempts. HPs report difficulties navigating these conversations either because they sense partners' discomfort or because partners "hijack" the interaction.

Conclusions: Important variations emerged among BCS, partner, and HP themes. Partners can find it difficult to engage in face-to-face SH conversations. Research should explore how to help partners more openly communicate about SH issues. Less threatening means for providing couples with information should be explored. HPs struggle to integrate both perspectives. Resources should be created to help HPs navigate uncertain terrain and to provide alternative strategies when in-person triadic interactions are not feasible.

Poster Session Abstracts

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Challenges Faced by Medical Professionals Choosing Careers in Cancer Prevention and Academic Medicine

Chavez JC, Kok MY, Chang S

There is a need for more cancer prevention physicians, but clinicians face many barriers at different stages of their careers that may deter them from pursuing cancer prevention. Those early in their medical training may understand the benefit of prevention but be more drawn to the heroism of curing the disease. On the other hand, those who are years into clinical practice face difficult challenges if they decide to transition the scope or focus of their work to cancer prevention. The purpose of this study is to identify the barriers that medical professionals face as they consider careers in cancer prevention and academic medicine. To identify such challenges, we interviewed full-time faculty at The University of Texas MD Anderson Cancer Center who had medical degrees and affiliations with departments in the Division of Cancer Prevention and Population Sciences. We conducted structured individual interviews between July 2016 and October 2017 and used atlas.ti software to code and analyze recorded interviews. Quotations were collectively reviewed to identify preliminary themes that described common challenges to entering careers in cancer prevention. From 16 interviews, we identified several major challenges faced by those early in their careers and several faced by those who transitioned into cancer prevention later in their careers. Many physicians reflecting upon their views of cancer prevention during medical school said that they had misconceptions about the field and lacked adequate guidance to enter the field since it was so new at the time. The challenges faced by physicians who transitioned into cancer prevention later in their careers included funding difficulties, need for additional training, and the unique challenges of conducting research and achieving progress in cancer prevention. In spite of their career success as physician faculty in cancer prevention, participants described specific deterrents to choosing careers in academic cancer prevention both early and late in their careers. To have impact upon the burden of cancer, continued characterization is needed of the barriers and facilitators encountered by physicians at all career stages pursuing skill in academic cancer prevention.

6

Interest and Uptake of MC1R Genetic Testing in Non-melanoma Skin Cancer Patients

Christian SN, Zielaskowski K, Lee EH, Leong S, Zhang L, Li Y, Robson ME, Hamilton JG, Halpern AC, Orlow I, Hay JL

Non-melanoma skin cancer (NMSC) is common, and although rarely fatal, a history of NMSC is a risk factor for melanoma, the most fatal form of skin cancer. Many NMSC patients engage in skin cancer risk behaviors such as indoor tanning and insufficient use of protective clothing and sunscreen. Certain common variants of MC1R, a gene involved in the regulation of skin pigmentation, increase melanoma risk. Genetic testing for common melanoma risk variants, not currently offered in standard clinical practice, may have personal utility to increase risk knowledge and modify health behaviors. We are conducting a prospective cohort study examining interest, uptake, and behavioral utility of MC1R genetic testing among individuals with a history of NMSC (target N=75). Patients are approached during a follow-up visit to the dermatology clinic. Recruited participants complete a baseline assessment, are invited to log on to our study website to learn about MC1R testing, and then decide whether to accept or decline testing. Participants who accept testing return completed saliva test kits. DNA is extracted and sequenced in a CLIA laboratory. Test results are provided to participants in the form of written risk feedback. The participants' responses to testing are assessed two weeks later. Skin cancer risk behaviors and attitudes are assessed three months after baseline. Of the 28 participants who have completed the baseline to date, 13 logged on the website and chose genetic testing. Current trends indicate that women and those who are not working are more likely to pursue testing. Of those who have chosen testing, 46% have a history of additional cancers, 85% have a history of sunburns, 67% do not tan easily, 31% report that their skin burns easily. Future data collection and analyses will determine sun protection behaviors and beliefs, utility of MC1R testing, impact on engagement with skin cancer risk behaviors, and reduction of burden of disease within public health. If results are promising, they will be used to shape acceptability of this test within this at-risk population. We acknowledge the funding support of the MSK Survivorship, Outcomes, and Risk Developmental Funds Award to Jennifer Hay and Irene Orlow (MPIs), and the MSK Cancer Center Core Grant P30 CA008748.

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Missed opportunities for HPV vaccination and education among cervical cancer survivors

Edler M, Fernandez AM, Anderson K, Scalici J, Daniel CL

Purpose The objectives of the study were to explore cervical cancer incidence and associated variables among women who were age-eligible for the human papillomavirus (HPV) vaccine as well as to assess HPV vaccination history, beliefs, and associated behaviors within this cohort.

Methods A mixed methods data collection strategy was used for the study. ICD 9 and 10 data were used to identify women treated for cervical cancer at Mitchell Cancer Institute (MCI) from 2011 to 2016 and abstract demographic, clinical and pathologic variables. The Alabama vaccination registry was used to compare vaccination data. A randomized sample of the cohort was also recruited to participate in a qualitative telephone interview regarding HPV vaccination participation, knowledge, and attitudes.

Results Of the 464 cervical cancer patients treated at MCI from 2011-2016, 137 (30%) were under age 40 at diagnosis; 77 women with invasive disease were identified (median age=33 years). Fifty-six percent of patients were seen by a gynecologist within 5 years of diagnosis. Seventeen patients participated in the qualitative portion of the study. Of those interviewed, the majority (94%) reported current access to regular medical care. None had received or been offered the HPV vaccine, but the majority stated they likely would have if it had it been recommended. Most reported awareness of health risks associated with HPV; however, substantial gaps in knowledge and mixed understanding of the causation between HPV and cervical cancer diagnosis were observed.

Conclusions Cervical cancer presents a unique opportunity for prevention due to the efficacy of the HPV vaccination. Qualitative interviews revealed a significant missed opportunity for prevention since the majority of the women stated they would have been vaccinated if given the option. The majority of the cohort demonstrated awareness of HPV related health risks, albeit after their eligibility to receive the vaccine had passed, and many after their cancer diagnosis. Informed and educated survivors could be powerful advocates to increase HPV vaccination rates among current youth, utilizing personal experiences and community engagement as potential vaccination promotion strategies.

8-T

A 12-week community based physical activity program for lung cancer survivors: a non-randomized pilot study of feasibility.

Devonish JA, Culos-Reed SN, Bebb DG, Gage-Bouchard EA

This pilot study examined the feasibility and effects of a 12-week community-based physical activity (PA) program for lung cancer survivors (LCS). **Methods.** Participants were accrued via oncologist referral at follow-up clinic, not currently receiving any curative or palliative intent cancer treatments, and had satisfactory performance status. A single group of 15 (13 non-small cell, 2 small cell) LCS participated in an individually-tailored, home-based program supplemented with twice weekly community-based sessions promoting adherence to guidelines for older adults. Sessions involved aerobic, resistance, flexibility, and balance exercises). The primary outcome was adherence (ie, attendance). Intervention effects were secondary outcomes. Assessments were at pre-, post-, and 3-month post-intervention. **Results.** Ten participants completed the intervention, 2 withdrew from the study after pre-assessment prior to intervention, 3 attended ≥ 5 sessions before withdrawing due to disease progression/clinical deterioration, and 3 more were lost only to follow-up assessment. Mean attendance for the entire sample and those attending ≥ 1 session was 58.1% and 67.0%, respectively. Intervention effects of the 7 intervention and assessment completers found time effects for PA, lower body strength, functional capacity, and aerobic power, and both the functional well-being (FWB), physical functioning (PF) quality of life (QL) domain subscales (all p-values <0.05 ; ES ≥ 0.73). Post-hoc analyses found increases in PA (p=0.039; ES=0.73), lower body strength (p=0.003; ES=0.08), functional capacity (p=0.003; ES=0.79), and aerobic power (p=0.007; ES=0.75) between pre- and post-intervention. In terms of QL, PF improved (p=0.009, ES=0.71) while FWB remained unchanged (p=0.32). Between post-intervention and follow-up, there were no significant differences in PA, lower body strength, functional capacity, or aerobic power. PF and FWB QL domains remained unchanged (p=0.99) and declined (p=0.006; ES=0.74), respectively. No adverse events reported. **Conclusion.** A community based PA intervention is feasible for some LCS. Those able to participate experience sustained benefits. The dissemination and sustainability potentials of community-based interventions for survivors are high.

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Associations between Tobacco Retail Outlet Density and Cotinine Levels in Mothers and Children

Fuemmeler BF, Do EK, McClernon FJ, Oliver JA, Ribisl K, Sheng Y, Maguire R, Zhang J, Murphy SK, Hoyo C, Dashman B, Wheeler DC

Pregnant women and children are particularly vulnerable to tobacco smoke exposure, which has been associated with a myriad of adverse health effects, including chronic disease such as cancer, and lung and heart disease. One potential means of reducing the health burdens associated with tobacco smoke exposure is to reduce the availability of tobacco products by regulating the number, type, and location of tobacco product retailers. Previous studies have found an association between the density of tobacco retail outlets (TROs) and smoking behavior, including higher incidence of lapse and relapse among adults and increased adolescent smoking. Yet, the extent to which TROs relate to objective measures of smoke exposure has not yet been examined. Thus, the purpose of this study was to determine the relationship between TRO density and biochemically verified exposure to tobacco smoke among women and children. Participant data was obtained from the Newborn Epigenetic Study (NEST), a prospective pre-birth cohort of women and their children located in the southeastern United States. Cotinine was measured from plasma blood samples provided by women during pregnancy ($n=610$), and saliva samples from their children ($n=235$; mean age=5 years). Cotinine values were $\ln$ transformed. TRO density was calculated using kernel density estimation of a point process with a Gaussian kernel function and estimated bandwidth from TRO points ($n=269$) within Durham County, North Carolina. Linear regression models were used to estimate the association between TRO density and cotinine values within mothers and children, separately. There was a significant, positive relationship between TRO density and cotinine values (standardized $\beta=0.45$, p -value <0.001) among mothers. A similar relationship was found for children (standardized $\beta=0.30$, p -value <0.001). This is the first study to establish an association between TRO density and biomarkers of smoke exposure measured quantitatively. Results suggest that restricting TRO density may help to reduce tobacco smoke exposure and thereby possibly reducing the negative health effects among women and children.

10-T

Fear of Recurrence and Physical Activity Participation in Breast Cancer Survivors

Gavin KL, Welch WA, Siddique J, McAuley E, Phillips SM

Background: Emerging evidence indicates moderate to vigorous physical activity (MVPA) may be associated with improved disease outcomes (i.e. progression, recurrence, survival) in breast cancer survivors (BCS). Unfortunately, up to 70% are insufficiently active. Few studies have explored fear of cancer recurrence as a motivator for physical activity following cancer. These fears, uniquely experienced by cancer survivors, are important to consider in order to inform effective MVPA interventions tailored for BCS. This study examined the relationship between overall fear of recurrence and specific fears with MVPA. Further, this work assessed potential moderation by demographic and disease characteristics.

Methods: Separate regression models examined the relationship between overall fear of recurrence and subscales (Concerns about Recurrence Scale; subscales include concerns related to role, womanhood, health, and death) and Actigraph measured MVPA at 6 months in BCS ($n=375$ M age= 56.1 years SD=9.4). All models were adjusted, for self-reported age, race, education, BMI, stage of breast cancer diagnosis, treatment type, total comorbidities, and baseline MVPA. Moderation by demographic and disease characteristics on recurrence fear subscales that were statistically significantly associated with MVPA were also examined.

Results: Overall fear of recurrence with 6 month MVPA did not reach statistical significance. However, health ($\beta = 11.39$ SE=4.96, $p=0.02$) and death worries ($\beta = 11.37$ SE=3.78, $p<0.01$) were both associated with MVPA. The interaction ($\beta = -11.81$ SE=5.72, $p=0.04$) between health worries ($\beta = 13.19$ SE=5.01, $p=0.01$) and BMI ($\beta = 19.14$ SE=5.7, $p=0.17$), centered on the mean, on MVPA were significant. Results for the interaction ($\beta = -10.08$ SE=4.44, $p=0.02$) between health worries ($\beta = 25.60$ SE=7.97, $p<0.01$) and stage of diagnosis ($\beta = 12.68$ SE=11.41, $p=0.27$), on MVPA also reached statistical significance.

Conclusion: Findings suggest certain fears related to cancer recurrence concerning death and health are associated with MVPA in BCS. Future work should seek to evaluate the potential psychosocial mechanisms between these fears and MVPA resulting in intervention strategies that increase MVPA and lower recurrence fears for a healthier cancer survivorship.

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Healthy lifestyle counseling discussions initiated by healthcare providers among older cancer patients: Results from a survey at 12 hospitals in the south-eastern US

Halilova KI, Pisu M, Azuero A, Kenzik KM, Williams CP, Williams GR, Rocque GB, Kvale EA, Meneses K, Partridge EE, Demark-Wahnefried W

Purpose: To explore characteristics of older cancer patients who reported healthy lifestyle discussions initiated by their providers in the southeastern US.

Methods: Cross-sectional analysis of data from the Univ of Alabama at Birmingham Health System Cancer Community Network. Older patients (65+ yrs.) diagnosed after January 1, 2008 (N=1,460) were surveyed from 2013-2015 via telephone. Demographic information, cancer diagnosis characteristics, weight, height and healthy behavior data were collected. Patients were asked if their providers (an oncologist, another doctor and/or a nurse) engaged them in healthy lifestyle discussions and if so, which topics were discussed: exercise; healthy diet; vegetable consumption; weight loss; and/or smoking cessation. Descriptive statistics were computed for all variables of interest. Bivariate associations were conducted to explore the frequency of lifestyle counseling topics discussed by healthcare providers as related to patient characteristics.

Results: The mean age was 74 yrs. (SD 5.7), 60% were females, 81% were non-minority and 16% were newly diagnosed (<1 year). Among all respondents 49% reported engaging in discussions related to exercise, 53% to healthy diets, 28% to vegetables consumption; among overweight 33% were advised to lose weight and among smokers 85% were advised to quit smoking. Younger patients (65-74 yrs.) were more likely to be advised on all healthy lifestyle topics as compared to older patients (≥75 yrs.), (48% vs. 38%). More females (30%) vs. males (25%) were advised to eat vegetables. Minority respondents (50%) reported being advised on exercise, healthy diet, vegetables and weight loss more frequently than non-minority participants (43%). With the exception of tobacco-use, survivors more proximal to their cancer diagnosis < 1 year vs. >1 year reported having more lifestyle discussions on lifestyle topics (43% vs. 35%).

Conclusion: In general, healthcare providers might be overlooking the need for engaging older (≥75 yrs.), non-minority patients, and longer-term survivors in healthy lifestyle discussions; this need is exceptionally high among male patients in whom vegetable consumption is not addressed. Additional studies are needed to explore reasons why discussions were so infrequent.

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Cardiovascular risk knowledge and attitudes among breast cancer survivors with cardiovascular risk factors

Hillyer GC, Crew KD, Accordino MK, Kalinsky K, Trivedi MS, Schmitt KM, Reyes A, Cruz A, Hershman DL

Recent studies show that patients diagnosed with early-stage invasive breast cancer are more likely to die from cardiovascular disease (CVD) than breast cancer. We conducted a pilot study to evaluate knowledge of CVD risk and attitudes toward CVD risk-reducing behaviors among 31 post-menopausal breast cancer survivors prescribed an aromatase inhibitor (AI) who had ≥1 CVD risk factors (tobacco use, obesity, hypertension, hypercholesterolemia, diabetes, or coronary artery disease). CVD health behaviors, attitudes, barriers and facilitators of CVD risk-reduction, CVD risk knowledge, and medication adherence were assessed. Mean age of the participants was 64 years; half were Hispanic and 38.7% were non-Hispanic white. None were current smokers. Based on a 3-point Likert scale, the majority reported paying "some" to "a great deal of attention" to CVD health behaviors such as getting enough physical activity, eating a healthy diet, and controlling their weight (mean 8.9 [SD 2.6], range 4-12). Only 77.4% stated they gave "a great deal of attention" to taking all of their prescribed medications. Most reported that being physically active, eating a healthy diet, cutting out fat and salt, and taking their prescription medicine was "very important" (mean 10.3 [SD 2.1], range 3-12), but only 19.9% and 25.8% found attending a fitness center/gym or walking up a flight of stairs, respectively, "very easy" to do. When asked agreement on a 4-point Likert scale, more than 83% agreed that "each of us is directly responsible for our weight" and 77.4% agreed that "being physically active is a matter of wanting to do it and applying oneself". Knowledge of CVD risk factors was high except for knowledge that "good" cholesterol levels should be high (38.7% correct); that, as breast cancer survivors, risk of CVD is higher (51.6% correct) and, that some breast cancer treatments can increase their risk (48.4% correct). Adherence to medications for CVD risk reduction (antihypertensives, statins, hypoglycemics) and AI was medium to low for all medications. Our pilot study suggests that breast cancer survivors at high risk for CVD are motivated to be "heart healthy", but lack knowledge of their CVD risk and require additional support to lower their CVD risk and improve long-term survival.

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Reasons that mothers decline the HPV vaccine for their children: A qualitative study

Hirth JM, Cofie LE, Rupp RE, Kuo YF, Berenson AB

Purpose: To examine reasons mothers decline the human papillomavirus (HPV) vaccine after the major barriers of information about the vaccine and cost were addressed by a vaccination program. Understanding why parents decline this vaccine can assist efforts to improve vaccination rates in pediatric clinics.

Methods: Data were from a qualitative evaluation of parents of 9-17 year old children who declined the HPV vaccine after receiving information about it in 2 participating pediatric clinics. Face-to-face semi-structured interviews were audio-recorded, and transcriptions were made and checked by a second reviewer. We used thematic analyses to identify themes and sub-themes related to reasons why the HPV vaccine was declined.

Results: Eleven mothers of vaccine-eligible children participated. While most mothers felt positive about vaccines in general and felt they helped their children, some expressed reservations about individual vaccines that they perceived as being new or associated with negative outcomes. Mothers who declined the HPV vaccine felt it was too new and untested, was not effective enough, or might have bad side effects. Some perceived that their children were too young to get the HPV vaccine, and that their children were too young to think about sex. Mothers with children 9-10 years of age mentioned that the guidelines recommended the vaccine for children 11 to 12 years old, and did not want to get it until they reached the recommended age. Others indicated they were contemplating getting the vaccine for their children, or intended for them to get it when they are older. Many of these mothers wanted to search for more information on their own before having their children vaccinated.

Conclusion: These findings reveal the need for providers to stress to vaccine-hesitant parents that the HPV vaccine is well-tested, effective, and has been safely administered adolescents in the US and worldwide for more than 10 years. Further, parents need to be informed that immune response is stronger in young adolescents and fewer doses are recommended for protection in adolescents under 15 years of age.

14-T

But I saw it on YouTube..." A descriptive study of sunscreen (mis)guidance on YouTube

Julian, AK, Hartman, A., Welch, J., Chou, S., Augustson, E., Perna, F.

Purpose: To examine the frequency and quality of information about sunscreen on YouTube by video source.

Methods: In Nov. 2017, researchers identified the top 20 YouTube videos using sorting strategies Relevance and View Count for each of five search terms: sunscreen health, sunscreen Information, sunscreen natural, sunscreen ingredients and sunscreen cancer. Inclusion criteria were English language and view count greater than 1,000 (N = 115 unique videos). Videos were coded by source, content type, valence toward sunscreen use, scientific source citation and presence or absence of 6 positive and 2 negative reference standards for effective sunscreen use. Videos with negative valence were also coded for recommendation of alternative sun protection strategies.

Results: Videos were most frequently uploaded by end users with a financial interest (31%) and healthcare providers (HCP) (22%). Federal agencies (CDC, FDA) and cancer prevention organizations were not represented among the sources based on these search terms, a finding which has implications for search optimization strategies used in YouTube communication.

Conclusion: YouTube features videos with accurate information about effective sunscreen uses, but HCP as a video source cannot be used as a heuristic for scientific quality. Videos advocating disuse of sunscreen frequently featured individuals identifying as healthcare providers.

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Comprehension, satisfaction, and responses to MC1R genetic test results in a diverse population of primary care patients

Khan E, Zielaskowski K, Meyer White KA, Sussman A, Guest DD, Buller DB, Bigney J, Hunley K, Kaphingst KA, Berwick M, & Hay JL.

Background: Common germline variants in the melanocortin-1 receptor (MC1R) gene confer a two- to three-fold increase in melanoma risk in the general population. Understanding patients' responses to genetic test feedback will help shape the public health translation potential of melanoma genetic testing, as it may inform precision prevention strategies for melanoma.

Study Aims: As part of a randomized controlled trial examining interest, uptake, and utility of MC1R genetic testing in Albuquerque, New Mexico primary care settings, we examined the following responses two weeks after test results receipt: 1) Comprehension and recall of results; 2) Satisfaction with testing; 3) Emotional reactions to results; 4) Intended behavior changes related to testing; and 5) Family communication regarding results.

Methods: Participants who requested and followed through with testing by returning the saliva test kit (n=145, aged 23-79, 10% ≤ high school education) received a results report indicating either average or higher risk for developing melanoma. The Risk Feedback Comprehension Assessment, a follow-up survey with open-and close-ended questions, was conducted via telephone or email two weeks after results were received.

Results: Of the 145 participants who received results, 57 (39%) had average risk results, and 88 (61%) had higher risk results. Most (81%) participants correctly recalled their results. Overall, participants found their results to be believable (M=6.43 out of 7, SD=1.37) and clear (M=6.22 out of 7, SD=1.19). They had low levels of adverse emotional reactions, such as nervousness (M=1.96 out of 7, SD=1.41) and test regret (M=1.50 out of 7, SD=1.05), regardless of average or higher risk results. Those with higher melanoma risk had greater determination to change sun protection compared to those with average risk (M=4.94 vs. M=3.68, respectively, $p<.001$). Most (64%) had discussed their results with family.

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Racial Differences in HPV Vaccine Awareness Among Women in HINTS: Role of trust in cancer information from doctors and HPV-related communications

Gonzalez J, Solid C, Langford AT

Purpose: The human papillomavirus (HPV) is the most common sexually transmitted infection in the U.S. and is linked to cervical and other cancers. The HPV vaccine can prevent most HPV-related cancers, yet uptake of the vaccine is low. The objective of this study was to: (1) Describe awareness of HPV and the HPV vaccine in a multi-ethnic, nationally representative sample; and (2) evaluate potential predictors of HPV and HPV vaccine awareness, like trust in cancer information from doctors, prior discussions about the HPV vaccine with doctors, and HPV vaccine recommendations from doctors.

Methods: Data from women in the 2014 Health Information National Trends Survey were evaluated (HINTS 4, Cycle 4, N=2158). The primary outcomes were having heard of HPV and the HPV vaccine. Bivariate analyses assessed differences in observed proportions by race/ethnicity and two separate multivariate logistic regressions assessed predictors of HPV and HPV vaccine awareness.

Results: In bivariate analyses, no differences in HPV awareness were observed for White, Black, Hispanic, Asian, and "Other" women ($p=0.13$). However, there was a significant difference in awareness of the HPV vaccine ($p=0.01$). White women had the greatest awareness (80%), compared to Black (66%), Hispanic (68%), Asian (67%), and "Other" women (82%). In logistic regression, race/ethnicity, age, education, and prior discussions with a doctor about the HPV vaccine were significantly associated with HPV awareness. For example, Black women were 58% less likely to have heard of HPV compared to White women (OR=0.42; CI: 0.19, 0.94, $p=0.035$). Also from logistic regression, having heard of HPV, having had prior discussions with a doctor about the HPV vaccine, and Hispanic ethnicity were significantly associated with awareness of the HPV vaccine. Compared to White women, Hispanic women were 81% less likely to have heard of the vaccine (OR=0.19; CI: 0.04, 0.79, $p=0.02$). Trust in cancer information from a doctor was not associated with awareness of HPV nor the HPV vaccine.

Conclusions: Discussions with doctors are associated with awareness of the HPV vaccine. Strategies to enhance patient-provider communication may increase HPV vaccine awareness and uptake in diverse women over time.

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Selecting and Training Community Health Educators to Address Prostate Cancer Disparities

Leader A, Quinn A, Zeigler Johnson C, Weddington P, Feldstein J, Fortune T, Chanton C, McDonald J, Glanz K

Purpose: In response to disproportionately high rates of prostate cancer (PCa) morbidity and mortality among African American males, we designed a nested, community-based, cluster randomized controlled trial to test the impact of community health educators (CHEs) delivering PCa risk and screening messages directly to men in their community. Here, we describe the process for selecting and training the CHEs to be members of the research team.

Methods: Because no agreed-upon training protocol for CHEs exists, we adapted other CHE training protocols to meet our needs. CHEs were selected through community contacts and had demonstrated commitment to their neighborhoods. Previous experience in the health care field was not required. The protocol included 10 sessions, taught over 5 months.

Topics included the purpose and function of the prostate, risk factors for PCa, pros and cons of screening, and the benefits of an informed decision about screening. We also trained CHEs on human subjects' protection, proper data collection procedures, and group facilitation techniques. CHEs evaluated the quality of the training with a survey.

Results: CHEs had backgrounds in community organizing and behavioral health, as well as current or previous careers as clergy, postmen, and transit agency workers. Eight of the 10 CHEs completed the training and 6 of the 8 CHEs attended all 10 sessions. At the end of the training, all 8 men felt prepared to be a CHE and that the training was comprehensive and culturally sensitive to the needs of their community.

Discussion: We designed, implemented, and evaluated a training protocol for CHEs that can be adapted or used by other researchers to implement a similar type of community-based intervention. The content of the training could possibly be modified to address disparities in other cancer types. CHEs need not have a background in health care to be trained as a CHE; other skill sets and commitment to the community are equally important.

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Geographic Disparity of Tobacco Use in Missouri

Lian M, Yun S, Lessov-Schlaggar CN, Liu Y, Colditz GA, Lynskey MT, Madden PA, Bucholz KK, Heath AC

Purpose: To examine the prevalence and geographic disparity of tobacco use and relevant area characteristics in Missouri.

Methods: Data from 2011 Missouri County-level Study (CLS) were analyzed to identify the product types of tobacco use, including cigarette, other tobacco products (cigar, bidi, pipe, kretek or clove cigarette), and smokeless tobacco products (chewing tobacco, snuff or snus). Using U.S. Census data, a Zip code-level socioeconomic deprivation (SED) index was developed to evaluate small-area neighborhood SED context. Rural/urban locations were defined according to the USDA urban-rural codes. Tobacco outlet locations and tobacco taxation rates were obtained from the Missouri Department of Mental Health and Department of Revenue. Zip codes were used for linking neighborhood measures to the CLS with extensive individual characteristics, including health behaviors and self-reported tobacco policies.

Results: The overall prevalence of tobacco use in Missouri was 28.5% (cigarette: 23.1%, other products: 5.1%, smokeless products: 4.4%). Significant geographic hotspots (higher-than-expected) of cigarette smoking were found across the state (prevalence varied from 26.7% to 31.0%). The prevalence rate was higher in neighborhoods with greater SED (highest quartile vs. lowest quartile: 33.9% vs. 24.6%), higher density of tobacco retailers (highest quartile vs. lowest quartile: 33.7% vs. 23.2%), and in rural areas (rural vs. urban: 32.9% vs. 28.3%). The proportion of tobacco users was lower in neighborhoods with local tobacco tax (27.0% vs. 31.5%) and among those with self-reported private (home/car) tobacco bans (10.5% vs. 53.7%), workplace bans (22.5% vs. 36.9%), and those who supported the clean air policies (14.4% vs. 47.0%).

Conclusion: The prevalence of tobacco use in Missouri is significantly higher than the targets of the Healthy People 2020 and there is significant geographic heterogeneity in tobacco use behaviors. Future studies should focus on developing effective multilevel strategies for tobacco control interventions to substantially decrease the prevalence and eliminate geographic disparity of tobacco use.

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How does a colorectal cancer screening decision aid plus patient navigation promote screening completion? A mediation analysis from randomized controlled trial data

Malo TL, Brenner AT, Weaver MA, Reuland DS

Purpose: Screening is a powerful but underutilized colorectal cancer (CRC) prevention tool. CRC screening decision aids and patient navigation can improve screening completion. However, the mechanisms through which these interventions contribute to changes in screening behavior are not well understood. We sought to examine potential mediating effects of intermediate decision-making outcomes on CRC screening completion among patients who viewed a screening decision aid and received patient navigation.

Methods: Participants (n=265) at two study sites were randomized to view either a CRC screening decision aid (intervention) or food safety (control) video before a primary care encounter. Immediately after the encounter, they completed a survey assessing intermediate decision-making outcomes, including CRC screening test preference (colonoscopy or fecal testing vs. none), knowledge (range: 0-6), discussion with their provider (yes/no), and self-efficacy to complete CRC screening (not at all [1] to extremely confident [5]). After completing the survey, intervention participants received support for screening completion from a patient navigator. Screening completion was assessed for all participants by electronic health record review six months after their encounter. We fit a probit path analysis model to assess the potential mediating roles of the intermediate decision-making outcomes on screening completion, controlling for study site.

Results: CRC screening test preference was the only significant mediator of the relationship between the intervention and screening completion ($p < 0.001$). This variable explained approximately 40% of the total effect of the intervention on screening completion. Model fit was good: root mean square error of approximation = 0 (90% confidence interval: 0, 0.074) and Tucker-Lewis Index = 1.039.

Conclusion: Findings suggest that an intervention in which patients viewed a decision aid and received patient navigation increased CRC screening completion, in part, by enhancing patients' ability to indicate a specific CRC screening test preference. Designing behavioral CRC screening interventions to facilitate patients' test preference formation may improve their effectiveness. Future research should also consider measuring this construct.

20-T

Primary care provider experiences with survivorship care plans for pediatric patients with acute lymphoblastic leukemia

Mann K, Acharya A, Pannier ST, Warner EL, Schott S, Hacking C, Gerdy C, Wright J, Wu Y, Kirchhoff AC

Purpose: We evaluated the feasibility of delivering survivorship care plans (SCP) to pediatric acute lymphoblastic leukemia cancer patients' primary care providers (PCPs), as little is known about pediatric provider experiences with SCPs and their preferences related to SCP content. Here we report on PCPs' opinions of an SCP while caring for pediatric leukemia patients after the end of cancer treatment.

Methods: Oncology teams created the individualized SCP that were mailed to PCPs along with a survey on the SCP content for 21 pediatric leukemia patients treated at a children's hospital in Salt Lake City, UT. Descriptive statistics were used to summarize demographics, knowledge regarding patient's cancer diagnosis, treatment, and follow up care, satisfaction with the SCP and future use of SCP.

Results: Of 21 mailed SCPs/surveys, 15 PCPs responded. PCPs reported the most helpful sections of the SCP were recommended medical follow-up (93%), cancer diagnosis details (93%), surgery information (93%), allergies/adverse drug reactions (93%), and the contact information for the oncology provider team (100%). A total of 80% of PCPs agreed that the SCP would improve their communication with their patient's oncologist. All PCPs agreed that the SCP would improve their knowledge for future care of their patient. However, 60% of PCPs reported that primary care guidelines for pediatric cancer survivors are not well defined. Also, only 40% felt comfortable evaluating potential long term effects among pediatric cancer survivors and 28% felt prepared to manage long-term effects in pediatric cancer patients.

Conclusions: PCPs play a critical role in the ongoing management of pediatric cancer survivors. Our study found that PCPs believe that SCPs will help with communication between oncology and primary care. While SCPs included useful information, many PCPs still feel unprepared to manage late effects these cancer patients may experience as they transition away from oncology care. Our findings suggest that in addition to providing PCPs with a SCP, programs should prioritize giving PCPs specific guidelines and resources concerning ongoing care for pediatric cancer survivors.

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Unmet basic needs and cessation history among very low income smokers

McQueen, A., Kreuter, M.W., Caburnay, C., Thompson, T., Roberts, C., Luke, A.

Purpose: A preliminary examination of prior cessation attempts among very low income smokers enrolled in a novel cessation intervention.

Methods: Adults who call MO 2-1-1 for assistance meeting their basic needs (e.g., food, housing, utilities) are screened for smoking status, interest in quitting in the next 30 days and willingness to share their contact information. Research staff contacted smokers to invite their participation, obtain consent, and administer a baseline survey. Participants are randomized to a 2x2 intervention: basic needs navigation (yes/no) x quitline program (standard/specialized). Interventions last 3 months and follow up surveys are administered at 3 & 6 mo follow up.

Results: Of the 200 initial baseline respondents, 80% are female, 63% African American, 26% White, mean age = 45 years (SD=12.6). About a third had less than a high school education and a third completed HS or a GED, 71% were unemployed, and 78% had a total annual income <\$20,000 (49% <\$10,000). Most had medical insurance (38% Medicaid, 12% Medicare, 14% dual) but 30% were uninsured; 38% don't have a regular doctor. Many rated their health as poor/fair (58%; 83% had a chronic disease (M=2.4). Unmet needs recorded (M=2.0, SD=1.3) include: not having enough money for unexpected expenses (82%), bills (54%), necessities (36%), trouble finding childcare, if needed (44%), transportation (19%), food (14%), housing (11%), and unsafe neighborhood (24%). Participants had been smoking M=29 years (SD=13.3), 16.3 cigs/day. Nearly all (91%) tried to quit before using various resources: 65% print materials, 34% websites, 16% quitline, 7% group class, 66% NRT (58% patch, 31% gum, 15% lozenge) and 27% prescription quit aids. Number of cigarettes smoked daily (OR=1.05, p=.008) and chronic conditions (OR=1.30, p=.004) were positively associated with prior use of quit aids. The number of chronic conditions (OR=1.24, p=.043) was also positively associated with prior use of a quitline.

CONCLUSION: Smokers who call 2-1-1 and enroll in our cessation intervention are willing to quit in the next 30 days and nearly all have tried before. We found higher than expected rates of ever use of NRT. Greater unmet needs may make quitting harder for very low income smokers.

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Family experiences with survivorship care plans after completion of therapy for pediatric ALL

Pannier ST, Acharya A, Mann K, Schott S, Hacking C, Gerdy C, Wright J, Warner EL, Wu Y, Kirchhoff AC

Purpose: Late-effects, second cancers, and recurrence are a concern for pediatric cancer survivors, survivorship care plans (SCPs) have the potential to help as they transition from oncology to primary care. This study was conducted to evaluate the impact and use of individualized survivorship care plans for childhood cancer survivors.

Methods: N=21 patients and N=24 parents/caregivers were enrolled between September of 2015 and October 2016. Patients were eligible if they had achieved remission of acute lymphoblastic leukemia (ALL) between four months and one year prior to the study. Patients over the age of 11 (N=13) and at least one caregiver were surveyed at three month intervals; enrollment (T1), SCP delivery (T2), and follow-up (T3) (retention 90.9%). Descriptive statistics were generated for demographic and cancer characteristics and p values calculated using McNemar tests to track change from T1 through T3.

Results: A majority of patients and parents/caregivers were white (87.5%), college graduates (54.2%), and insured privately (76.2%). While 91.3% of parents/caregivers intended to share their child's SCP with the child's school, other healthcare providers, or family members at T2 only 60.9% had done so by T3 (p=0.01). At T1 the majority of caregivers (N=17, 73.9%) thought the plan should be delivered after treatment but by T3 less than half agreed (N=11, 47.8%) and preferred the plan to be delivered before the end of treatment (N=12, 52.2%). A small proportion of patients surveyed said they felt concerned about what they had learned from their SCP at T1 (N=2, 15.4%) and T3 (N=2, 16.7%). The majority of patients felt that their "doctor made sure I understood everything on the SCP" (N=11, 91.7%) and "learned something new from the SCP" (N=10, 83.3%). Understanding of survivorship care and cancer diagnosis increased among both parents and patients after delivery of the SCP.

Conclusions: Although parents/caregivers and patients reported high levels of knowledge about diagnosis and survivorship care prior to delivery of the SCP, they still showed an increase in these areas at T3. Pediatric oncology practices interested in providing SCPs should disseminate SCPs to primary care at the completion of therapy as families may not share plans independently.

Poster Session Abstracts

23-T

Patient Decision Aids, Knowledge and Control Preference for Decision Making Among Lung Cancer Screening-Eligible Individuals: A Pilot Study

Randle A, Carter-Harris L

Purpose: Shared decision-making with the use of one or more patient decision aids (ptDA) is mandated by Medicare in the US for reimbursement of lung screening. However, we do not know the control preference for decision-making (patient-centered, shared, clinician-directed) among screening-eligible individuals or type of ptDA individuals prefer in the context of lung screening. It is critical to understand individual control preference, preference for ptDA, and preference for whom individuals would like to engage in a screening discussion to tailor interventions and foster engagement in this high-risk population.

Methods: Cross-sectional, descriptive pilot study using survey methodology and web-based recruitment methods conducted with 51 lung screening-eligible individuals measuring control preference, sociodemographic variables, health literacy, numeracy, patient-clinician communication, knowledge about lung cancer and screening, ptDA preference (pamphlet, video, tailored computerized education), clinician preference (physician, nurse, advanced practice provider, team of professionals), and stage of adoption for lung screening.

Results: Participant mean age was 60.2 years (SD4.7); majority were female (60.8%) and White (72.5%). Most noted a patient-centered control preference for decision making (n=31,60.8%) compared to shared (n=17,33.3%). Total knowledge scores were low (mean=3.61;SD1.5; range 0-9). Higher levels of patient-clinician communication were positively correlated with numeracy ($r=.329$; $p=.02$). Most participants preferred a tailored computerized education module (n=33;64.7%), and preferred to discuss the option of lung screening with either a doctor (n=30;58.8%) or advanced practice provider (i.e., NP/PA) (n=10;19.6%).

Conclusions: Results indicate initial differences in control preference for decision making in lung screening as well as potential preference for different types of decision support in both tools and individual delivering the education. Future research with a larger sample size is warranted to examine the influence of control preference on engagement in patient-clinician discussions around lung screening as well as types of decision support and clinicians most effective in supporting in patients this decision-making process.

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Comparing help-seeking for cancer-related symptoms in the United States and the United Kingdom: Results from the International Cancer Benchmarking Partnership

Rendle KA, Quaife SL, Brain KE, Donnelly C, Forbes LJ, Gavin A, Harrison S, Simon AE, Kobrin

PURPOSE: To compare predictors of help-seeking for cancer-related symptoms in the United States (US) and the United Kingdom (UK). **DATA:** Population-based survey data (Awareness and Beliefs about Cancer instrument) collected independently among English-speaking adults (aged 50 or older) in the United States in 2014 (n=1,425) by the National Cancer Institute, and in the United Kingdom in 2011 (n=6,965) as part of Module 2 of the International Cancer Benchmarking Partnership.

METHODS: Using Andersen's Behavioral Model, we compared the following predictors of help-seeking for cancer-related symptoms: self-reported health status, difficulty in accessing a doctor, reasons for delaying care (4-items: too embarrassed, worried about wasting doctor's time, worried about what the doctor might find, and too busy), and negative cancer beliefs (3-items: people with cancer can expect to continue normal activities (disagree); cancer can often be cured (disagree); and cancer is a death sentence). Using multivariable logistic regression adjusted for age, education, and gender, we examined associations between help-seeking predictors and country. All analyses were stratified by age (<65 years old vs 65 years or older), and were weighted for survey sampling designs in each country.

RESULTS: In contrast to the US, both younger and older adults in the UK were substantially more likely to report being worried about wasting the doctor's time [<65y: aOR: 6.69 (4.32, 10.37); 65y+: aOR: 3.72 (2.49, 5.55)], but less likely to report being too busy as reasons to delay care [<65y: aOR: 0.60 (0.45, 0.81); 65y+: aOR: 0.52 (0.33, 0.82)]. In the UK, younger adults were less likely to view cancer as incurable [<65y: aOR: 0.39 (0.26, 0.59)] and as ceasing normal activities [<65y: aOR: 0.49 (0.31, 0.77)]. Older adults in the UK were less likely to report being worried about what the doctor might find as a barrier to seeking care [65+: aOR: 0.60 (0.44, 0.82)]. There were no significant differences by country in difficulty accessing a doctor, or self-reported health status.

CONCLUSION: Systematic measures and research across countries are needed to compare how individual, cultural, and healthcare system factors intersect to impact help-seeking behaviors for cancer-related symptoms.

Poster Session Abstracts

25-T

Sugar-Sweetened Cigarettes: Added Sugars in American Cigarette Brands

Seidenberg AB; van Nierop LE; Lindblom EN; Ribisl KM

Purpose: Sugars are commonly added to American-blended cigarettes, and the presence of sugars in cigarettes increases the appeal, toxicity, and addictive potential of smoking. The purpose of this study was to identify the types and relative quantities of added sugars in the tobacco of popular American cigarette brands.

Methods: We reviewed the company websites of Philip Morris USA (PMUSA) and RJ Reynolds Tobacco Company (RJR) for brand-specific ingredient lists for all PMUSA (n=179) and RJR (n=162) cigarette brand styles (combined 79% of US cigarette sales in 2016) and composite lists of all cigarette tobacco ingredients for both companies. From these lists, we identified known forms of saccharides (sugars and oligosaccharides).

Results: All PMUSA and RJR cigarette brands contained at least one type of added sugar, except one RJR brand (6 brand styles), which contained no additives. By weight, sugars were the number one ingredient (excluding tobacco and water) in all PMUSA brands (e.g., Marlboro, Parliament, Virginia Slims). Examples of sugars added to PMUSA brands included high fructose corn syrup, sucrose, maltol, and ethyl maltol. Among RJR brands, sugar was the number two ingredient by weight (excluding tobacco and water) in most brands (e.g., Camel, Newport, Pall Mall). In some RJR brands, quantities of added sugar relative to other ingredients were more variable, ranging from the first to fourth most used ingredient by weight (e.g., Carlton, Doral, Kent, More). Types of sugars added to RJR brands included high fructose corn syrup, brown sugar, honey, glucose, and a variety of fruit juice concentrates (e.g., apple, fig, pineapple). Interestingly, many menthol cigarette brands (e.g., Newport, Marlboro Menthol, Camel Menthol) contained greater quantities of added sugar than menthol.

Conclusions: A variety of sugars, including sugars routinely added to processed foods and beverages, are added to American cigarettes. Further, by weight, added sugars were the number one or number two ingredient in most cigarette brands. Given that added sugars increase the appeal, toxicity, and addictive potential of smoking, regulatory actions should be considered (e.g., a product standard for sugar) for the protection of public health.

26-T

Predictors of HPV Vaccine Follow-Through among Privately Insured Patients

Spencer JC, Brewer NT, Trogon JG, Wheeler SB, Dusetzina SB

Objective: We sought to assess predictors of timely HPV vaccine follow-through among privately insured individuals initiating the 3-dose vaccine series.

Methods: We examined claims data for 1,332,217 privately insured US individuals ages 9-26 who initiated the HPV vaccine series from 2006-2015. The main study outcome was receipt of the third HPV dose within twelve months of the first dose, compared by year of initiation. We also examined alternative definitions of follow-through, including receipt of two doses within twelve months and receipt of three doses within eighteen months. Using multivariate analysis, we assessed the relationship between HPV vaccine follow-through and age at initiation, region of residence, insurance plan type, initiating provider type, and receipt of flu vaccine.

Results: HPV vaccine follow-through showed a dramatic drop over time among females (from 67% in 2006 to 38% in 2015, $p<.001$) and a small drop for males (from 36% in 2011 to 33% in 2014, $p<.001$). Similar patterns emerged in analyses that controlled for patient characteristics or used alternative definitions of follow-through. Females receiving their first dose from an OB/GYN were more likely to complete the vaccine series than those receiving a first dose from a pediatrician (55% vs. 44%, $p<.001$). For both males and females, receipt of a flu vaccine in the prior year predicted timely vaccine follow-through (males: 46% vs. 32%; females: 53% vs 44%, $p<.001$).

Conclusions: Low rates of HPV vaccine initiation and follow-through have left a generation of young people unnecessarily at risk for cancer, precancer and other HPV-related sequelae. While HPV vaccine initiation is increasing, follow-through rates are low and are declining. Vaccine programs should emphasize the importance of timely vaccine follow-through and should target a wide range of providers.

Poster Session Abstracts

27

Pilot Trial of an Intervention Delivered to Young Women Indoor Tanners Via Facebook Groups: Engagement and Acceptability

Stapleton JL, Manne SL, Pagoto SL

Objective: To evaluate engagement with and acceptability of using a secret Facebook group to deliver a healthy body image intervention to young women engaged in indoor tanning.

Methods: Seventeen young women completed a baseline survey and joined a secret Facebook group with intervention content delivered via daily posts for 4 weeks. Engagement data was extracted and acceptability was measured via a follow-up survey.

Results: The study had a high retention rate (94%, 16 participants). On average, posts were viewed by 91% of participants, liked by 35%, and commented on by 26%. The average comment rate was highest (65%) for posts that elicited comments by directly posing questions or discussion topics to the group. Average intervention acceptability ratings were highly positive and participants reported feeling connected to the group and its topic. Average rates of past 1-month indoor tanning reported following the intervention were lower than the baseline rate ($p = 0.08$, Cohen's $d = 0.47$).

Conclusions: This study is novel in demonstrating participant engagement with and acceptability of using Facebook secret groups to deliver a dissonance-inducing intervention approach that utilizes group-based discussions related to body image. The study is also unique within the field of skin cancer prevention by demonstrating the potential value of delivering an indoor tanning intervention within an interactive social media format. The findings suggest that Facebook metrics of intervention post engagement (i.e., likes and comments) may vary based on post types and that designing specifically labeled discussion posts may be helpful for soliciting engagement as well as challenging beliefs.

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Perceived risk of breast cancer and breast health communication among Latina women in Chicago, 2017

Tamayo LI, San Miguel L, De La Torre RA

Purpose We examined if Latinas' risk perception about receiving a breast cancer diagnosis was related to how likely they are to communicate about breast health and to whom (e.g., blood relatives vs. general public) and if this relationship varied by the type of breast health intervention women experienced.

Methods This study uses 65 participants (Latina, 52-74 years old; no mammogram in past 2 years) who were recruited via community venues, underwent 1 of 2, 3-session interventions, and completed 2 surveys (pre/post-intervention). One of the interventions educated women about breast cancer risk factors; the other trained women on how to communicate breast health information. We used multivariable regression with GEE to examine the main effects of perceived risk on odds of communicating about breast health (family and friends; blood relatives specifically). We also included an interaction variable to examine moderating effects of intervention type on the relationship. Covariates that were included in the models were age, education, and the proportion of one's social network with whom the participant talked about breast cancer in the past year.

Results Among our 65 participants, the average age was 60.5 (SD= 9.20). Approximately 21.5% had $\leq$ high school education, 45.6% were uninsured, and 46.8% were married. Women with moderate perceived risk had higher odds of breast health communication with family and friends relative to women with low perceived risk (OR = 3.8, 95%CI 1.2, 11.6; $P=0.02$) and women with high perceived risk (OR = 4.6, 95%CI 1.4, 14.35; $P=0.02$). Women with moderate perceived risk also had higher odds of talking with blood relatives relative to women with low perceived risk (OR=3.1, 95%CI=1.0, 9.7, $P=0.05$), but not women with high perceived risk (OR=3.0, 95%CI=0.70, 12.84; $P=0.14$). Intervention type did not moderate associations (P 's=0.73-0.82).

Conclusion Women with moderate perceived risk appear to be more likely to communicate about breast health. This may be because they have enough information to interest them in breast cancer (relative to women with low risk) but not enough to scare them from it (relative to women with high risk). Limitations include a small sample and convenience sampling.

Poster Session Abstracts

29-T

A novel, web-based intervention to reduce cancer treatment-related financial distress: a randomized controlled pilot study

Tran G, Nicolla J, Friedman F, Samsa G, Ubel P, Pollak K, Zafar Y

Purpose: Many patients on anti-cancer therapy experience treatment-related financial burden. Pathlight, an interactive web application, was designed to: 1) screen for financial distress; 2) educate on health-related financial topics; 3) coach via video-conference on communicating with providers about costs; and 4) navigate to financial assistance. The primary aim of this study was to assess usability of Pathlight and its impact on financial distress, willingness to discuss costs with doctors, and knowledge.

Methods: Adults with cancer who reported moderate financial distress and were receiving treatment in solid tumor oncology clinics were randomized 1:1 to Pathlight or usual care (text and video resources from Cancer.net). Patients randomized to usual care were crossed over to Pathlight after efficacy testing for usability. We used the validated System Usability Scale (SUS) to assess usability (SUS score >68 is above average). We assessed financial distress with the validated 11-item COmprehensive Score for financial Toxicity (COST) measure (lower score correlates with less financial distress). We asked patients if Pathlight "improved my knowledge about financial aspects of cancer care and what can be done about it," and if "using this website was helpful with my financial concerns" with responses measured using a 5-point Likert scale. We assessed desire to discuss costs with, "Will you talk to your doctor about costs?"

Results: 30 patients enrolled. 26 had usability data available. The median SUS score was 70. 94% of patients agreed/strongly agreed that Pathlight improved knowledge of financial aspects of cancer. 71% agreed/strongly agreed that the tool was helpful with financial concerns. Patients using Pathlight experienced a greater absolute decrease in median COST scores (3.5 vs 2.0 decrease). Relative to controls, a higher proportion would consider a cost discussion with their oncologist (33% vs 20%).

Discussion: Pathlight demonstrates high usability and preliminary effectiveness in decreasing financial distress. Interventions such as Pathlight may improve quality of life and outcomes by reducing financial toxicity.

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The fatalistic cancer beliefs and information seeking behaviors of formerly incarcerated African American and Hispanic men

Lian, Z; Valera, P

Purpose of the Study: This study examined the association between fatalism, perceived susceptibility to cancer and online health information seeking among formerly incarcerated African American and Hispanic men

Method: A survey assessing demographics, incarceration experience, psychosocial, behavioral, and cancer health information seeking was administered to 230 previously incarcerated men aged 35 years and older. Data was analyzed via descriptive statistics, cross tabulation analysis and binary logistic regression.

Results: Over half of the study participants (68.7%) held the fatalistic belief: "When I think of cancer, I automatically think of death." Second, men who perceive a higher risk of developing cancer were more likely to believe that "it seems like everything causes cancer" and "when I think of cancer, I automatically think of death". Participants who worry about developing cancer more frequently are more likely to think of death automatically when they think of cancer. Interestingly, older formerly incarcerated Black and Hispanic men those between 55 and 70 years old and widowed were less likely to think of death when asked about their susceptibility to cancer. Furthermore, participants who use the Internet to look for health or medical information (i.e., engaging in health information seeking) were less likely to agree with the fatalistic belief: "It seems like everything causes cancer."

Conclusion: Formerly incarcerated African-American and Hispanic men demonstrate lack of confidence in cancer prevention and control. Moving forward, involving the criminal justice system in cancer health efforts may help to reduce cancer risk and improve cancer outcomes among this vulnerable population. Instructing individuals under community supervision about ways in which to access health information, such as using the Internet and social media sites, may be one communication strategy to begin to improve cancer health outcomes

Poster Session Abstracts

31-T

Employment outcomes of young adult cancer caregivers compared to young adults who are not caregivers

Warner EL, Wilson A, Ellington L, Kirchhoff AC

Purpose: Previous research on cancer caregiving has not focused on younger adults who may have less stable employment. We determine the effect of caregiving status, compared to non-caregivers, on full-time employment among young adults.

Methods: Using the 2015 Behavioral Risk Factor Surveillance System (BRFSS) data, we identified 91,400 young adults aged 18-39 years (full sample 441,456). There were 4,103 individuals who identified as caregivers; of these 325 were cancer caregivers. We compared raw counts and BRFSS-weighted proportions for sociodemographic factors between cancer caregivers and non-caregivers using cross-tabulations and Pearson χ^2 tests. The primary binary outcome was current full-time employment. We estimated propensity score adjusted odds ratios (AOR) using logistic regression to compare employment among young adult caregivers compared to non-caregiver young adults, and for young adult cancer caregivers compared to non-caregiving young adults combined with caregivers of other diseases. Among cancer caregivers only, we estimated the effect of caregiving intensity (low, moderate, high) on employment using logistic regression. All estimates include BRFSS weights.

Results: Females, lower education, and minority race/ethnicity were more likely to be caregivers of any disease (both $p < 0.01$), and minority race/ethnicity was associated with being a cancer caregiver ($p \leq 0.01$) compared to non-caregiving young adults. Young adult caregivers of any disease had significantly lower odds of being employed compared to young adults who are not caregivers (AOR:0.69 95%CI 0.60-0.80 $p < 0.001$), whereas young adult cancer caregivers did not differ in odds of employment compared to young adults who were not caregivers. After adjusting for age, sex, race/ethnicity, marital status, education, and health insurance, young adult cancer caregivers with the highest level of caregiving intensity had significantly lower odds of being employed compared to those with the lowest caregiving intensity (OR:0.17 95%CI 0.05-0.58 $p < 0.01$).

Conclusions: Young adult caregivers are less likely to be employed. Those providing high-intensity cancer caregiving may need more robust employment accommodations to mitigate the negative effect of caregiving on young adults' employment status.

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A text messaging intervention to promote self management for breast cancer patients receiving chemotherapy: a randomized controlled trial

Wen KY, Miller S, Smith R, Goldstein L.

As a core component of cancer care, the use of chemotherapy is likely to increase considerably with projected increases in the incidence of breast cancer and advances in treatments. However, chemotherapy may improve overall survival; it is also often associated with substantial treatment-related toxic effects that negatively affect health-related quality of life. Mobile health strategies may be one innovative method to improve patient's symptom management within a social cognitive theoretical framework while also facilitating doctor-patient communication in oncology outpatient care. Through an iterative patient-centered formative evaluation process, we developed an automatic bidirectional text messaging (TXT) intervention to help women to cope with breast cancer chemotherapy. In a randomized controlled trial, we compared symptom distress and quality of life among patients undergoing chemotherapy who received: 1) theory-based and evidence-informed text messages for education, symptom management and support for 8 cycles, or 2) usual care with ACS chemotherapy booklet. Symptom distress, quality of life, and other psychosocial variables were assessed monthly in both groups. The TXT group received daily texts and satisfaction with the intervention was assessed. Among 100 patients, 70 were Caucasian with a mean age of 59 years. Symptom distress was significantly lower and quality of life was higher in the TXT group at month 3. Regarding acceptability, 70% of eligible participants consented and 90% of the TXT group participants were satisfied with the intervention. TXT intervention participants texted back to the system for 2388 times requesting additional texts with a range of 3-58 requests. Feasibility and high satisfaction were established. Mobile health interventions show promise in promoting self management for breast cancer patients receiving chemotherapy.

Poster Session Abstracts

33

Patient characteristics associated with participation in a web-based decision support trial for women at increased breast cancer risk: ENGAGED 2 trial

Wernli KJ, Bowles EA, Evans C, Gao H, Hansen K, Knerr S, Leppig K, Schwartz MD, O'Neill SC

PURPOSE: We are testing a personalized, web-based breast cancer risk decision support tool for women at increased risk. We evaluated patient characteristics associated with trial participation.

METHODS: Eligible women are 40-69 years with a recent negative mammogram at Kaiser Permanente Washington. Women's breast cancer risk is calculated based on risk factors reported at recent mammogram. Eligible women had either an intermediate 5-year risk of invasive breast cancer (1.67%–2.49%) and extremely dense breasts or a high 5-year cancer risk ($\geq 2.50\%$) and either heterogeneously dense or extremely dense breasts. We used plain language to ensure all patient content was at a 6th grade reading level. Potential participants are mailed a recruitment letter and contacted via phone by trained interviewers within a few days to assess willingness to participate complete baseline interview. We calculated descriptive frequencies of patient characteristics of women who did and did not participate in the research study. We used multivariable logistic regression to calculate odds ratios (OR) with 95% confidence intervals (CI) for patient characteristics associated with participation adjusted for age, race, breast cancer family history, biopsy history, income, breast cancer risk, mammography facility, education, and menopause status.

RESULTS: The study has contacted 2,263 eligible women and 710 (31.3%) have enrolled in the trial. Among participants, 71% were ages 60-69, 73% had $>2.50\%$ five-year risk of breast cancer, 48% had no prior breast biopsy, 45% had a first-degree family history of breast cancer, 72% were college graduates, and 95% identified as White. Higher education was statistically significantly associated with study participation; women with some college (OR=1.7, 95%CI 1.1-2.6) or college degree (OR=2.6, 95%CI 1.7-3.9) were more likely to participate than high school educated women. Patient characteristics associated with non-participation included: Asian race (OR=0.3, 95%CI 0.1-0.6) and no prior breast biopsy (OR=0.6, 95%CI 0.4-0.9).

DISCUSSION: Use of plain language and representative sampling alone are not sufficient to ensure representative participation. Interpretation of trial results must include consideration of sample generalizability.

34-T

Social Gradient in Cancer Incidence and Mortality: A Systematic Review

Abdiwahab EA, Hiatt RA, Tahir, P

This systematic review was conducted to determine if existing relationships in the literature manifest a gradient in cancer mortality and incidence either directly or indirectly with Socioeconomic Position (SEP) for all cancers. We conducted a systematic search of seven electronic databases to identify peer-reviewed empirical articles relating to the influence of Socioeconomic Position (SEP) on cancer incidence and mortality published in English from 1996-2016. We identified 47 relevant articles that evaluated the relationship between SEP and cancer mortality and/or incidence. The majority were cohort (23/47) and ecological (16/47) studies. The most common cancers assessed were Breast (24/47) and Lung (19/47) followed by Colorectal (15/47) and Prostate (12/47). Cancer incidence was an outcome in 29 articles, mortality was an outcome in 11 articles, and only seven articles assessed both. Most studies used individual income, education, occupation, and social class as a measure of SEP; studies that were ecological frequently used neighborhood SES as a measure of SEP. High SEP was consistently associated with both Breast cancer and Melanoma incidence in the U.S. and internationally. The majority of studies also found an inverse relationship between SEP and cancer so that most disadvantaged individuals were at highest risk for Lung and cervical cancer; findings were mixed for other cancers. The relationship between SEP and cancer mortality however were inconsistent between U.S. and European studies; studies in the U.S. generally showed an association with low SEP and higher mortality whereas European studies showed inconsistent findings. The majority of studies attributed life-style factors including smoking, reproductive patterns, diet, physical activity, and alcohol intake, and differences in access to healthcare to the observed gradient. We found evidence of a gradient in cancer incidence and mortality with regard to SEP. The relationship between SEP and cancer incidence and mortality appeared to vary by cancer site and between countries. Further research needs to be conducted to understand potential drivers of the observed gradient.

Poster Session Abstracts

35-T

Barriers to Colorectal Cancer Screening in Rural Appalachian Kentucky

Aroh A., Adegboyega A., Smalls B., Hatcher J.

Background: Appalachian Kentucky residents suffer significant colorectal cancer (CRC) disparity, in part related to low utilization of CRC screening. Reducing or removing potential barriers to CRC screening uptake may increase utilization of CRC screening in this population. The purpose of this study is to identify barriers to CRC screening in adults aged 50 years and older in rural Appalachian Kentucky.

Methods: We report barriers to CRC screening based on baseline data collected during an emergency department (ED) placed intervention to reduce disproportionate burden of CRC among rural Appalachian Kentucky adults. Descriptive and bivariate analyses are reported.

Results: Questionnaires were completed by 191 adults aged 50 and over, waiting for non-urgent care or with a family member in the ED of rural Appalachian hospitals. Participants were mostly Caucasian (98%), female (57%), aged 58 ± 8 years, who had household income $< \$20,000$ (56%), and 95% had never undergone CRC screening. Fear of CRC result (51%), perceived pain (50%), and cost (49%) were the most salient barriers to CRC screening test. The following four demographic variables were significantly associated with barriers to CRC screening; education, marital status, income and age.

Conclusions: Rural Appalachian Kentucky residents do not screen for CRC according to guidelines partly due to perceived barriers to CRC screening. This population will benefit from interventions that address barriers to screening and appropriate navigation to affordable and accessible CRC screening resources within the local community. In addition, considering the cultural norms peculiar to this population, the use of community health workers (CHW) and individuals who have undergone CRC screening may be valuable resources to design other interventions like short video messages to talk about the screening process and the benefits of CRC screening.

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Disparities in Time to Treatment in Breast Cancer Patients in the National Cancer Database, 2004-2013

Arroyo NA, Hampton JM, Gangnon RE, Sprague BL, Stout NK, Alagoz O, Greenberg CC, Burnside ES, Trentham-Dietz A

Purpose: Time to treatment after breast cancer diagnosis can influence survival and other health outcomes. This study aims to examine patient factors related to increased time to treatment in a national surveillance study.

Methods: We used data from the National Cancer Database for breast cancer patients from 2004 – 2013 and included female patients > 18 years old with in situ or invasive breast cancer ($n=2,013,590$). We examined time from initial diagnosis to treatment in relation to covariates including age, race/ethnicity, health insurance, geographic region, treatment, and stage at diagnosis. Multivariable analysis of variance was used to estimate the mean number of days to treatment after diagnosis. We evaluated potential interactions between race/ethnicity and insurance.

Results: Overall, the mean time to treatment was 28.6 days (median 24.0). After adjusting for covariates, the time to treatment was longer for older women (40-49, 28.9; 50-59, 29.0; 60-69, 28.8; 70-79, 28.2) compared to younger women (ages 18-29, 25.5; ages 30-39, 27.6); longer for women with Medicaid or no insurance (35.9 and 35.4 days, respectively) compared to private insurance (27.7); and longer for women treated with mastectomy and reconstruction (35.3 days) compared to lumpectomy w/ or w/o radiation (26.5). Mean time to treatment varied by race/ethnicity: white, 27.4 days; black, 34.8; and Hispanic, 36.3. For those with private insurance, white women, on average, received initial treatment in 26.9 days, while black and Hispanic women, on average, received initial treatment in 32.7 and 32.8 days, respectively. White women with Medicaid or no insurance received initial treatment on average in 32.7 and 29.7 days, respectively, whereas treatment was first received after a longer time period, on average, among black women (39.3 and 40.8) and Hispanic women (41.8 and 43.9) with Medicaid or no insurance, respectively.

Conclusions: After adjusting for multiple factors including stage, treatment, and insurance, minority women were more likely to have a longer time before initiating treatment. Interventions focused on decreasing time to treatment may be necessary to eliminate racial and ethnic disparities in breast cancer outcomes.

Poster Session Abstracts

37-T

Cancer control research priorities in Arabs living in the United States: a systematic review

Chebli P, Watson K, Al-Kodmany A, & Molina Y

Background: Our systematic review aims to synthesize the literature on cancer in the Arab American (ArA) population and develop recommendations for future cancer control and prevention research on ArAs.

Methods: A systematic review was performed using PubMed, Web of Sciences, CINAHL, Embase, Cochrane, and GoogleScholar. Titles explicitly mentioning Arabs and cancer were eligible for abstract review. Abstracts were eligible if cancer prevention or control with ArAs was discussed, if published in English, with no restriction on publication date.

Results: The systematic review identified 2,322 articles. Of those, 77 abstracts, and 46 full-length articles were reviewed. Of the 46 full-length articles, 45 were peer-reviewed publications, 40 articles were observational studies, sample sizes ranged from 106 to 1,652, and sampling strategies included local community sampling or secondary analysis of population-based databases. Overall, ArAs have higher incidence of leukemia, bladder and thyroid cancers compared to other groups. Most commonly studied cancer sites were breast (37%), cervical (24%), and colorectal (13%). No article focused on prevention, 65% focused on screening, 2% on diagnostic follow-up, 13% on treatment/survivorship, and 10% of cancer burden. Observational studies largely focused on barriers and facilitators to cancer screening uptake, with the most common barriers being low English proficiency, religious beliefs, cancer stigma, unawareness of screening need, and difficulty navigating the U.S. health system. Intervention studies attempted to improve knowledge (57%) or to promote cancer screening (29%); 57% used pre- post designs and only 1 was a randomized trial. All interventions demonstrated significant impacts on knowledge and screening rates.

Conclusion: Cancer burden and behavioral risk factors in ArAs are difficult to ascertain without the inclusion of an "Arab" ethnicity category on population-based surveys. Epidemiological studies with a sociodemographic focus are needed to examine access, awareness and uptake of screening and treatment in ArA populations to guide the development of targeted interventions. From a clinical perspective, treatment adherence and confirmation of treatment effects with ArAs are needed to optimize treatment outcomes.

38-T

Colorectal cancer screening among foreign-born older adults living in the US: Gender and Racial differences

Cofie LE, Hirth JM, Berenson AB, Wong R

Background Previous research has explored disparities in colorectal cancer screening (CRCS) between foreign- and US-born individuals, but national level studies on CRC behaviors among foreign-born individuals are limited. We examined gender and racial/ethnic differences in CRCS among foreign-born older adults in the US, and additional factors impacting their screening behaviors including acculturation.

Methods Data were from the 2013 and 2015 National Health Interview Survey data on older adult women (N=2253) and men (n=1752) aged 50 to 75 years. Up-to-date CRCS was defined as a fecal occult blood (FOBT) test within 1 year, a sigmoidoscopy (SIG) within 5 years, or a colonoscopy (COL) within 10 years. We used multivariable logistic regression analysis to determine whether gender and race/ethnicity were associated with CRCS after controlling for sociodemographic, health access, and acculturation related factors. Analyses were stratified by gender to evaluate associations of interactions between gender and race/ethnicity, as well as gender and US citizenship with CRCS. All data were weighted to account for complex sampling methods.

Results Of the 4005 foreign-born participants, 49.83% had up-to-date CRCS. Difference in CRCS between women (51.40%) and men (47.90%) was marginally significant, $P \leq 0.06$. However, there was a significant difference in CRCS among Whites (58.078%), Hispanics (43.03%), Blacks (54.06%), and Asians (50.39%), $P < 0.01$. Overall, Asians were significantly less likely to report CRCS compared with Whites (AOR: 0.74, CI: 0.59- 0.93). US citizenship (AOR: 1.35, 95% CI: 1.11- 1.65), was associated with increased screening among women. Additional factors associated with increased CRCS included: increased age (≥ 65 years), higher income and education, having health insurance and having a usual source of healthcare. In analyses stratified by gender, race/ethnicity was associated with CRCS among women, but not men. Asian women were less likely to report CRCS (AOR: 0.69, CI: 0.50-0.96) than white women.

Conclusion Prevalence of CRCS is low among racial/ethnic minority immigrants, particularly Hispanics, in the US. Screening disparities experienced by these immigrants may be addressed by improving healthcare access, especially for noncit

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Abstract Withdrawn.

40-T

Patient Factors that Contribute to Racial Disparities in Early-Stage Breast Cancer Treatment

Doose M, Chandwani S, Hirshfield KM, Lin Y, Bandera EV, Demissie K

Purpose: Differential quality of treatment has been proposed as a cause for racial disparity in breast cancer (BrCa) mortality. We examined: (1) racial disparity in physicians' recommendation of treatment based on standard National Comprehensive Cancer Network (NCCN) treatment decision trees; (2) racial differences in patients' receipt of physician-recommended treatment; and (3) factors that are associated with undertreatment by race.

Methods: This study included African American (AA) and white women who participated in a population-based prospective BrCa cohort study. Participants were identified through rapid case ascertainment by the New Jersey State Cancer Registry. Eligibility for this analysis included 849 AA and 347 white women newly diagnosed with stage I, II, and T3N1M0 BrCa (2005-2015). Medical records were collected and abstracted for medical history, diagnostic work-up, and treatment information. We used NCCN guidelines to determine the type of treatments patients should have received based on clinical factors. Chi-square test was used to compare proportions by race. Using binomial regression, the likelihood of physicians not recommending therapy and patients not receiving physician-recommended treatment were compared by race after adjusting for age, income, insurance, and comorbidities. We used a generalized estimating equation procedure with a compound symmetry working correlation to account for within-physician correlation.

Results: Physicians were less likely to recommend endocrine therapy to AA women compared to white women when NCCN guidelines indicated its use (94% versus 98%, $p=0.01$). Income and insurance status were associated with physicians not recommending endocrine therapy ($p=0.013$ and $p=0.024$). Racial disparity of physicians' recommendation of endocrine therapy was attenuated when adjusted for income and insurance status. There were no racial differences for patients' receipt of surgery, radiation, and systemic therapy when recommended by their physician.

Conclusions: We observed racial disparity in physicians' recommendation of endocrine therapy when indicated by NCCN guidelines. Identifying patient factors that contribute to physicians' not recommending endocrine therapy is the first step to address inequities in BrCa care.

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Racial/ethnic Disparities in Patient-reported Quality of Care Measures among Medicare Breast Cancer Patients: analysis of the SEER-CAHPS Data Set

Farias AJ, Bang SI, Hamilton A, Du XL

Purpose: To identify racial/ethnic differences in the proportion of patients that rate excellent experiences with care at the time of cancer diagnosis.

Methods: We used the SEER cancer registry and patient surveys from the Consumer Assessment of Healthcare Providers and Systems (CAHPS)-linked dataset to identify Medicare breast cancer patients who were diagnosed from 1997-2011, ≥ 65 years, and completed a CAHPS survey prior to the diagnosis date. CAHPS survey responses were used to generate 4 composite measures of patient experiences with: 1) getting needed care, 2) getting needed prescription drugs, 3) getting care quickly, and 4) physician communication. We created a binary measure for each composite score of excellent (90-100) versus not excellent (10-80). In the multivariable logistic regression model examining racial/ethnic differences in the proportion of patients reporting excellent experiences with each composite measure, we included age at survey, marital status, census tract-level poverty and education, SEER region, Medicare insurance type, survey mode (mail versus phone), comorbidities, and survey year.

Results: Of the 10,144 patients, 80.7% were non-Hispanic white, 7.6% black, 7.1% Hispanic, and 4.6% Asian. The proportion of patients that reported excellent experiences for each composite measure are: 1) 70.2% for getting medical care when needed, 2) 76.5% for getting prescription care when needed, 3) 58.9% for getting access to medical care quickly, and 4) 65.4% for communicating with their physician. After controlling for potential confounders, Hispanics had lower odds of reporting excellent experiences with getting needed medical care (OR: 0.75, 95% CI:0.63-0.91) and with getting prescription drugs (OR: 0.79, 95% CI:0.65-0.97) compared to non-Hispanic whites. More importantly, this pattern persisted in the stratified analysis by cancer stage I-III for Hispanics versus non-Hispanic whites.

Conclusion: Among Medicare breast cancer patients, Hispanics compared to Non-Hispanic whites reported poorer experiences with getting needed care and prescription drugs prior to their diagnosis. Research is needed to determine whether these racial/ethnic differences in patient experiences with care are associated with receipt of appropriate cancer treatment.

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Challenges and Successes in Recruiting African Americans with Early Stage, Non-Small Cell Lung Cancer to an NIMHD-Funded, NCORP-Based Patient Navigation Trial

Ford ME, Bryant DC, Cartmell KB, Sterba K, Burshell DR, Hill EG, De Toma A, Knight KD, Weaver K, Calhoun E, Esnaola NF

BACKGROUND: Enrollment of early-stage lung cancer patients to randomized trials has historically been challenging. The STARS Trial enrolled 36 of 1,030 intended patients from 28 sites, while the ROSEL Trial recruited 22 of 960 intended patients from 10 sites. Unfortunately, evidence shows African Americans (AAs) with early-stage NSCLC are significantly less likely than their non-Hispanic white (NHW) counterparts to receive surgery, and may also be less likely to participate in lung cancer trials.

PURPOSE: The purpose of this research is to describe interim recruitment results from an NIMHD-funded, NCI NCORP-based patient navigation (PN) trial that is evaluating the effectiveness of the PN intervention in improving rates of lung-directed, curative-intent therapy (surgery and stereotactic body radiation therapy (SBRT)) in AAs with Stage I-II NSCLC.

DESIGN: The protocol-driven, barrier-focused PN intervention is being tested in a two-arm cluster-randomized trial (PN intervention vs. usual care). The trial includes 23 study sites in 13 US states, with an accrual goal of 200 participants. Trial recruitment enhancement activities include contacting physicians from multiple disciplines (e.g., primary care, pulmonology, radiology) to increase referral of AA patients to the trial, and raising community awareness of the trial.

RESULTS/CONCLUSIONS: To date, 111 AAs have been recruited, with a 90% consent rate. The majority of potential participants were ineligible due to receipt of surgery or SBRT prior to enrollment (27%), or having a later-stage lung cancer diagnosis (25%). The recruitment strategies have high potential applicability in future clinical trials that seek to improve the cancer health outcomes of AAs

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Sun Protection Practices and Recent Sunburn History among Latino and non-Latino White Melanoma Survivors

Glenn BA; Bastani RL; Chang C; Wong WK; Glanz K

Recent estimates suggest there are close to 1,000,000 melanoma survivors in the U.S. and the population continues to grow due to increases in incidence and improvements in 5-year survival rates. Following successful treatment completion, melanoma survivors remain at elevated risk for recurrence and development of new melanomas. Given this elevated risk, survivors are advised to limit sun exposure, avoid sunburns, and adhere to recommended sun protection practices. Limited research has focused on sun protection in melanoma survivors and most prior studies have focused exclusively on non-Latino whites, despite research documenting rising incidence rates and poorer survival outcomes in Latinos. Therefore, the purpose of the present study was to assess sunburn frequency and use of sun protection practices among Latino and non-Latino white melanoma survivors identified through the California Cancer Registry. All survivors had a child 0-17 years of age as the study included a focus on high-risk children. Data were collected from 316 melanoma survivors (Mean age = 42 years, 70% female, 17% Latino, Mean time since diagnosis = 41 months) through mailed, web-based, and telephone surveys. Use of sun protection varied widely by strategy with sunscreen (84%), sunglasses (84%), and wearing shirts with sleeves (75%) the most used strategies and seeking shade (65%) and wearing a hat (56%) the least used strategies. The mean sun protection composite score was 3.03 (Range 1-4). Despite relatively high reported use of some sun protection strategies, a quarter of the sample (25%) reported having experienced a recent sunburn. No differences were observed between Latinos and non-Latino whites for sun protection or sunburn outcomes. Greater use of sun protection was associated with survivors reporting more supportive social norms regarding sun protection, higher perceived severity of melanoma, and greater perceived efficacy of sun protection in reducing future melanoma risk. Study results find that a substantial proportion of melanoma survivors have experienced a recent sunburn despite reporting relatively high use of sun protection and suggest potential psychosocial targets for intervention.

44-T

A retrospective chart review quantifying breast cancer diagnosis and treatment delays among patients at a North St. Louis Community Hospital

Greaney SK, Odom EB, Min CJ, Colditz GA, James AS

Introduction: Although breast cancer mortality has declined in recent years, the disparity between black and white women has increased. There are many factors known to contribute to this disparity, however, the contributions of diagnosis and treatment delay are understudied.

Purpose: The purpose of our study is to identify if there is a disparity in diagnosis or treatment delay between black and white women with a new diagnosis of primary breast cancer at a community hospital in a socioeconomically disadvantaged region of our metropolitan area, and to identify potential points of intervention.

Methods: We reviewed the medical charts of women presenting to the community hospital with primary breast cancer and who were seen by Washington University physicians between Aug. 2014 and June 2016 (n = 134). The charts of 71 white and 63 black women were reviewed. We examined time from first reported symptom to screening, screening to diagnosis, diagnosis to first treatment, patient demographics, and disease characteristics. Basic descriptive analysis and 2-sample t-tests were used to compare characteristics of women based on race.

Results: We found that the median time from symptom to screening, screening to diagnosis, and diagnosis to first treatment for all women was 20, 9.5, and 29 days. Median time from symptoms to screening was 18 days for white women and 22 days for black women ($p = 0.91$), and from diagnosis to treatment was 27 days for white women and 34 days for black women ($p = 0.06$). Although black women had slightly longer delays than white women, the differences were not statistically significant. We also found that 44 (32.8%) women had significant delays (>90 days).

Conclusion: We conclude that most women receive timely and efficient breast cancer diagnosis and treatment, but that there are a number of women who experience significant delays. It has been shown that delays greater than 90 days negatively impacts survival, therefore the significant number of women who fall outside this timeframe is concerning. Unlike previous studies, we did not find a statistically significant racial difference. Further work should focus on interventions with the goal of improving diagnosis and treatment time for the subset of patients with long delays.

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Parental unemployment and receipt of social and unemployment benefits at conception and risk for childhood cancer in offspring

Heck JE, He D, Hall C, Olsen J, Ritz B, Hansen J

Purpose: The purpose of this study was to examine the relationship between parental unemployment and receipt of social benefits, as markers of a negative “healthy worker effect,” at conception and the risk of childhood cancer in offspring.

Methods: From the Danish Cancer Registry, we identified all childhood cancer cases younger than 16 years of age (N=2,304) among children born in Denmark 1993-2014 and diagnosed with cancer 1993-2015. Controls (N=230,400) were frequency matched by birth year and sex and taken from Central Population Register records. Parental employment information and receipt of social benefits (including unemployment benefits) was derived from the Supplementary Pension Fund, which has compulsory membership for all paid employees in Denmark. Covariate and health information was ascertained via linkage to the Central Population Register, Medical Births Register, and the Hospital Register. We used conditional logistic regression to determine associations with unemployment at conception for specific cancer types. Analyses were limited to parents older than age 27 at the time of their child’s birth.

Results: Any maternal unemployment was related to Non Hodgkin Lymphoma (NHL; OR=1.71, 95% CI 1.02- 2.89) and retinoblastoma (2.03, 1.15-3.58). In the subgroup of mothers receiving social benefits we estimated elevated ORs for acute lymphoblastic leukemia (ALL; 2.76, 2.09-3.65), acute myeloid leukemia (AML; 2.27, 1.21-4.27), NHL (5.88, 2.90-11.92), neuroblastoma (3.03, 1.69-5.43), rhabdomyosarcoma (3.87, 1.78-8.42), and Wilms tumor (2.09, 1.01-4.34). Any paternal unemployment was associated with bone tumors (1.67, 1.11- 2.50) and retinoblastoma (2.23, 1.33-3.74). When limiting the sample of fathers to those receiving social benefits, we estimated associations with ALL (5.53, 3.80-8.04), astrocytoma (7.74, 4.02-14.88), germ cell tumors (19.11, 8.20-44.52), and retinoblastoma (8.38, 3.51-20.0). We explore potential reasons for these associations including health behavior and prevalence of chronic diseases.

Conclusions: In this population-based study, we observed that receipt of social benefits at conception may be a marker for greater cancer risk in children.

46-T

Using longitudinal electronic health records to measure multilevel social disadvantage: Colorectal cancer screening among urban safety-net patients

Hughes, AE; Tiro, JA; Balasubramanian, B; Skinner, CS; Pruitt, SL

Introduction. Social disadvantage predicts colorectal cancer (CRC) outcomes across the cancer care continuum for many populations and places. Social disadvantage is part of meaningful use electronic health records (EHR) requirements, but frequently is inadequately assessed with cross-sectional, sector-specific measures (e.g., income at cohort entry) that are strikingly homogenous for vulnerable populations. EHRs can be linked to external data sources to create more informative measures of social disadvantage at multiple levels.

Purpose. By linking patient residential address in the EHR with external geospatial datasets, we investigate associations between novel measures of social disadvantage and CRC screening.

Methods. We identified urban safety-net patients eligible and due for CRC screening from the Parkland-UT Southwestern PROSPR cohort. We used the EHR to assess one-time receipt of colonoscopy or fecal immunochemical test (FIT) screening in the 18 months following cohort entry (defined as a primary care visit). We geocoded and linked EHR data to housing and Census data to generate measures of social disadvantage at the parcel and block group level. We fit multilevel logistic regression models to control for patient sociodemographics, comorbidity, and healthcare utilization.

Results. Among 32,965 safety-net patients, 45.1% received screening; there was limited block-group-level variation (e.g., 0.005). In adjusted models, measures of patient-level social disadvantage (e.g., sex) and healthcare utilization were associated with CRC screening receipt. Of all nine measures in our patient-level housing disadvantage (e.g., value of housing) and neighborhood-level physical (e.g., vacancy) and social disadvantage (e.g., poverty) groups, only 3 were significant: residential mobility, zoning, and majority race.

Conclusions. Address-based linkage of EHRs to external datasets can expand measurement of multilevel social disadvantage. Investigating social disadvantage in safety-net settings may be constrained by homogeneity (e.g., floor/ceiling effects). Therefore, more applications of these linkage methods and measures of patient housing, neighborhood physical, and neighborhood social disadvantage to more heterogeneous patient populations are needed.

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Engaging Linguistically and Ethnically Diverse Low Income Women in Health Research: A Randomized Controlled Trial

Joseph G. Nickell A. Stewart S. Cohen E. Burke N. Colen S. Lawlor C. Guerra C.

Underserved breast cancer patients and survivors are typically offered fewer opportunities to participate in research. In the context of a community-based participatory research project, we developed the Health Research Engagement Intervention (HREI), a one-on-one navigator-client education session that emphasizes the range of clinical trials and non-treatment studies ("health research") available to breast cancer patients and survivors. The HREI provides participants (navigated clients at a community organization, Shanti) with a laminated card that highlights resources, such as Breast Cancer Trials.org (BCT) that support health research information-seeking activities. We conducted a randomized controlled trial, comparing the HREI (intervention) to the information card alone (control). Pre- and post-intervention surveys measured the primary outcome of health research information-seeking behavior. Secondary outcomes included health research knowledge, attitudes towards research participation, and health empowerment. 133 Shanti clients participated, including 59 who spoke English, 48 Cantonese, and 26 Spanish. 130 completed both pre- and post-test surveys. Almost 1/3 of participants in both arms reported having talked to someone about health research or having called a telephone number or visited a website listed on the card (30% vs. 30%, $p=0.94$). On average the change from pre- to post-test in a 5-item knowledge score, adjusted for pre-test knowledge, was greater in the intervention group than in the control group ($p=0.028$). The proportion of participants who were very confident that they could find health research information (had health empowerment) remained essentially unchanged in both study arms. Women were more likely to seek information if they had higher pre-test knowledge scores (OR=3.5 per item, 95% CI 1.5-8.4) or a greater increase in knowledge from pre- to post-test (OR=2.2 per item, 95% CI 1.1-4.7); there was no association between information-seeking and health empowerment (OR=0.6, 95% CI 0.2-2.5) or study arm (OR=1.6, 95% CI 0.5-4.9). The HREI had a positive impact on knowledge of health research but did not significantly affect health empowerment or health research information-seeking behavior.

48-T

Preventing recurrence: disparities in adherence to surveillance colonoscopy among colorectal cancer survivors in South Carolina

Josey MJ, Schootman M, Probst JC, Eberth JM

Purpose: Surveillance colonoscopy is recommended the first year after a colorectal cancer (CRC) diagnosis, but uptake is suboptimal among minority populations. We examined whether racial disparities in adherence to surveillance to prevent recurrence are less pronounced in older CRC survivors (65+ vs. <65) due to improved access to health insurance.

Methods: We used the population-based, all-payer, South Carolina (SC) Central Cancer Registry linked to the SC Outpatient Discharge Database. Records for 8,432 patients aged 25 – 85 diagnosed with a primary CRC between 2000 – 2011 were linked with colonoscopy records from 2000 – 2014. Descriptive statistics and multivariate logistic regression were employed to describe and model adherence to surveillance colonoscopy within one year (9 – 15 months) after date of CRC diagnosis. Persons with stage IV cancer, <65 years with Medicare, and death before the surveillance window were excluded. Covariates included sex, primary insurance, stage at diagnosis (I – III) and residential location (urban vs. rural).

Results: Overall, 35% percent of black and 43% of white patients received a surveillance colonoscopy within the first year window. The interaction between age (<65 vs. 65+) and race was statistically significant, indicating that racial disparities in surveillance persisted, but were less pronounced, in the older patient cohort. In stratified models, the odds of adherence to surveillance were lower in younger [OR=0.67, 95% CI (0.57, 0.77)] and older [OR=0.73, 95% CI (0.63, 0.86)] black patients compared to white patients within the same <64 and 65+ age groups, respectively.

Conclusion: Although the 65+ population has more equitable access to care due to Medicare, we observed a persistent, although diminished, disparity in surveillance colonoscopy use in black patients even among this age group. Future cohort studies should investigate the reasons for lower adherence to surveillance colonoscopy in order to reduce or eliminate this disparity.

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Racial Differences of Lung-RADS among Patients Enrolled in a Lung Cancer Screening Program

Juon HS, McIntire R, Lake M, Zinner R, Barta J

Cancers of the lung and bronchus are responsible for nearly 30% of all cancer deaths in the U.S. While lung cancer incidence and mortality rates have decreased for all races over the past 20 years, major disparities persist among black and white patients with early stage lung cancer. The National Lung Screening Trial (NLST) demonstrated that annual low-dose computerized tomography (LDCT) screening reduced lung cancer mortality by 20% among high-risk smokers. A secondary analysis of the NLST, which included 4% black individuals, found that screening with LDCT had a greater impact on reduction of lung cancer mortality in blacks than in whites. But there is little knowledge about the impact of race on lung nodule malignancy in high-risk patients. The purpose of this study is to examine racial differences in lung malignancy among high-risk smokers. Retrospective data from the Jefferson Lung Cancer Screening Program were reviewed for patients referred to the Program between May 2015 and July 2017. Patient demographics (age, gender, race/ethnicity), BMI, medical and family history, smoking variables, and results of LDCT were extracted from the electronic medical record. Lung nodule malignancy was measured by Lung-RADS (0=1 & 2 for negative; 1=3, 4A, 4B & 4X for positive screening). Over a 2-year period, of 733 patients referred to the Program, 518 met eligibility criteria and underwent LDCT screening. 203 patients (39%) self-identified as Black, and 279 (53.6%) were White. About 14% of patients (n= 74) had a positive screen. There was a statistically significant racial difference in the distribution of lung-RADS 4 (15% for blacks vs. 4.1% for whites, $p = 0.02$). After adjusting for covariates, race was associated with lung-RADS: African Americans were more likely to have positive screening than whites (aOR=1.74, 95% CI, 1.02-2.98). In addition, females were less likely to have positive screening than males (aOR=0.48, 95% CI, 0.28-0.82). African Americans had higher odds of a positive screen than whites. Risk factors to explain higher lung nodule malignancy among African Americans may include genetics, SES, alcohol consumption, and/or access to care. Continued research efforts are needed to determine the contribution of other factors to lung cancer disparities.

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Exploring Acculturation as it relates to Sociodemographic and Behavioral Factors Underlying Racial/Ethnic Disparities in Cancer Prevention Behaviors in New Jersey

Kaplan A., Silvera S.A.N.

Racial/ethnic disparities in cancer outcomes have been well documented. While studies of racial disparities have largely focused on Black-White differences, this analysis of a cross-sectional study (n=459) of low-income women in New Jersey focuses solely on Latina participants (n=80). We sought to evaluate and characterize the relationships of HPV knowledge, vaccination rates, and cervical cancer screening and level of acculturation. Higher acculturation scores indicate stronger affiliation with Hispanic identity and lower scores indicate greater acculturation to US cultural norms. Scores in this study population ranged from 16.0 – 47.0, with a mean acculturation score of 31.3 ± 10.1 . Overall, 93.2% of participants reported ever having a Pap test, and 82.9% reported having had a Pap test in the last 3 years and this did not vary by level of acculturation. However, women who had not heard of HPV had higher mean acculturation scores, corresponding to lower levels of acculturation, than women who had heard of HPV (33.3 ± 2.4 versus 28.1 ± 1.3 , $p = .05$). Fewer than 15% of participants had been vaccinated, which is similar to the study population overall (non-Hispanic White and non-Hispanic Black women), and only 4 women reported full vaccination (3 shots). Participants who were less acculturated were less likely to report knowing that HPV is associated with cervical cancer risk. While this is a small sample size, these data suggest a need to better understand HPV vaccination utilization rates among Latinas in New Jersey, particularly lower-income Latinas, and how these rates vary by level of acculturation in order to better serve the needs of this community. In addition, data from the full study sample indicate that there is also a need to further provide more targeted primary prevention strategies. Shifting the emphasis from detection to cancer prevention can advance our work towards eradicating the racial/ethnic disparities in cervical cancer outcomes.

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51-T

Does socioeconomic status account for racial and ethnic disparities in childhood cancer survival?

Kehm RB, Spector LG, Poynter JN, Vock DM, Altekruse SF, Osypuk TL

Background: For many childhood cancers, survival is lower in non-Hispanic blacks and Hispanics compared to non-Hispanic whites, which may be attributed to underlying socioeconomic factors. However, prior childhood cancer survival studies have not formally tested for mediation by socioeconomic status (SES).

Purpose: The purpose of this study was to utilize causal mediation methods to quantify the role of SES in explaining racial and ethnic disparities in survival for several different types of childhood cancer.

Methods: We used population-based cancer survival data from the Surveillance, Epidemiology, and End Results 18 database for non-Hispanic black, non-Hispanic white, and Hispanic children, ages 0-19 years, diagnosed 2000-2011 (N=31,866). We estimated black-white and Hispanic-white mortality hazard ratios (HR) and 95% confidence intervals (CI), adjusted for age, sex, and stage at diagnosis. We used the inverse odds weighting method to test for mediation by SES, which was measured with a validated census tract composite index. Results: Non-Hispanic white children had a significant survival advantage over non-Hispanic black and Hispanic children for several cancers including leukemias, lymphomas, central nervous system tumors, neuroblastoma, and soft tissue sarcomas. SES significantly mediated the race/ethnicity-survival association for acute lymphoblastic leukemia, acute myeloid leukemia, neuroblastoma, and non-Hodgkin lymphoma; SES reduced the original association between race/ethnicity and survival by 44%, 28%, 49%, and 34% respectively for non-Hispanic blacks vs. non-Hispanic whites, and by 31%, 73%, 48%, 28% respectively for Hispanics vs. non-Hispanic whites.

Conclusions: SES mediates racial/ethnic childhood cancer survival disparities to varying degrees across cancers. The proportion of the total racial/ethnic survival disparity explained by SES varies between black-white and Hispanic-white comparisons for some cancers, suggesting that mediation by other factors differs across groups.

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Korean American Women Engage in Medical Tourism for Breast and Cervical Cancer Screening

Ko LK, Taylor V, Copeland W, Lee EJ, and Zhang Y

Purpose: Breast and cervical cancer screening among Korean American (KA) women remain low. Research on KAs show some KAs may be engaging in medical tourism and receiving care in their home country. The impact of medical tourism on breast and cervical cancer screening among KAs is unknown. The purpose of this study was to 1) examine the association between medical tourism and breast and cervical cancer screening and 2) characterize KA women who engage in medical tourism.

Methods: This was a community-based, cross-sectional study involving self-administered questionnaires conducted from August 2013 to October 2013. Data were collected on 181 KA women, ages 50-74, residing in the Seattle metropolitan area. The outcome variables were up-to-date with screening for breast cancer (having had a mammogram within the last two years) and cervical cancer (having had a Pap test within the last three years). Factors were socio-demographics, healthcare, acculturation, worries about medical care costs, and medical tourism. Multi-variate analyses were conducted using logistic regressions.

Results: Participants' mean (SD) age was 66 (12). More than half were married (53%), had at least a high school education (59%), were uninsured (56%), and were working (part-, full-time, and self-employed). About one third of the participants (35%) reported that they had traveled to Korea for healthcare, 2-3 times within the past five years. In multi-variate modeling, participants who engaged in medical tourism had 5.2 (95% CI: 1.5-22) greater odds of being up-to-date with screening for breast cancer and 8.1 (95% CI: 1.6-68.5) greater odds of being up-to-date for cervical cancer compared to those who did not engage in medical tourism. Participants who engaged in medical tourism had higher levels of education ($p = 0.01$), older age of immigration with 43 years (12) vs. 36 (12) ($p = 0.01$), and shorter years-of-stay in the US with 18 years (10) vs. 25 (11) ($p = 0.003$).

Conclusions: KA women in the Seattle metropolitan area report engaging in medical tourism. Engagement in medical tourism was associated with being up-to-date with screening for breast and cervical cancers. Future research should examine the underlying reasons on why KA women tend to seek screening abroad.

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Impacts of neighborhood characteristics on treatment and outcomes in women with ductal carcinoma in situ of the breast

Zhang S, Liu Y, Yun S, Lian M, Komaie G, Colditz GA

Purpose To examine the associations of neighborhood characteristics with treatment and outcomes of ductal carcinoma in situ of the breast (DCIS).

Methods From the Missouri Cancer Registry, we identified 9,231 women with DCIS diagnosed between 1996 and 2011. A composite index using the 2000 US Census data was developed to assess census tract-level socioeconomic deprivation and the rural-urban commuting area codes were used to define rural census tracts. Odds ratios (ORs) and 95% confidence intervals (95% CI) of treatment were estimated using logistic regression. Hazard ratios (HRs) of DCIS outcomes were estimated using Cox proportional hazards regression.

Results Women in the most socioeconomically deprived areas were more likely than those in the least deprived to have mastectomy (OR 1.54, 95% CI 1.34-1.76), no surgery (OR 2.06, 95% CI 1.39-3.07), no radiation therapy post-breast conserving surgery (BCS) (OR 1.66, 95% CI 1.38-2.01), higher risk of ipsilateral breast tumors (HR 1.44, 95% CI 0.97-2.13, Ptrend=0.08), and lower risk of contralateral breast tumors (HR 0.79, 95% CI 0.57-1.09, Ptrend=0.19). Compared with urban women, rural women had significantly higher odds of underutilization of radiation therapy post-BCS (OR 1.39, 95% CI 1.17-1.66), lower risk of ipsilateral breast tumors (OR 0.88, 95% CI 0.60-1.30), and higher risk of contralateral breast tumors (OR 1.17, 95% CI 0.87-1.57).

Conclusion While DCIS treatment significantly varied by neighborhood socioeconomic deprivation and rural/urban locations, we did not observe any significant differences in the risks of second breast tumors.

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Few know that radon gas leads to lung cancer in EPA-defined moderate to high radon counties in Utah

Martel L, Gee A, Akerley W, Harding G, Ou J, Kirchhoff A, Kepka D

Purpose: Following use of tobacco, radon is the second leading cause of lung cancer. Utah has the lowest rate of tobacco use in the United States, yet lung cancer continues to kill 19.2 per 100,000 Utahns each year. The purpose of this study is to evaluate baseline knowledge regarding the association between radon gas and lung cancer among people living in moderate to high radon counties in Utah.

Methods: Participants were recruited at community events in rural regions of Utah with Environmental Protection Agency (EPA)-defined moderate to high levels of radon gas exposure. Participants (N=59) included anyone over 18 years living in Utah. Participants completed a survey to evaluate knowledge regarding radon gas, perceived likelihood of developing cancer, and general cancer prevention knowledge. Descriptive statistics, including frequencies and percentages, were calculated using SPSS.

Results: 84.7% of survey respondents had heard of radon gas at baseline. However, only 42.4% of respondents knew that radon gas was associated with lung cancer, with 47.5% reporting "I don't know." Of the total respondents, only 13.6% are current or former smokers. Although 62.7% of respondents knew that there are high levels of radon in Utah, only 6.8% had previously tested their home for radon gas and only 32.2% thought that it was somewhat likely or very likely that their homes had high levels of radon. Additionally, 22% of respondents either disagreed or strongly disagreed when asked if radon was a health risk to themselves and their family and 81.4% of respondents did not believe that radon increased someone's risk for cancer. When asked about mitigation, 78% of respondents knew that it was possible to mitigate in a home with high levels of radon gas.

Conclusions: Although a majority of respondents have heard of radon gas, less than half could identify radon gas as a cause of lung cancer and most did not think that radon increased cancer risk. The lack of knowledge regarding this association highlights the importance of providing education to at risk populations in regions with EPA defined moderate to high levels of radon gas. Increasing knowledge and awareness of the health risk associated with radon gas is a priority for improving radon testing and mitigation efforts.

Poster Session Abstracts

55-T

Disparities in Retail Marketing for Menthol Cigarettes in the United States, 2015

Mills SD, Henriksen L, Golden SD, Kurtzman R, Kong AY, Queen TL, Ribisl KM

Low socioeconomic status groups and Blacks suffer from the highest rates of tobacco-related cancer mortality and also have disproportionately high prevalence of menthol cigarette smoking. Studies show that the tobacco industry disproportionately targets retail menthol cigarette marketing to youth, Blacks, and those with low income. Such studies are generally limited to samples in specific cities or states. This study describes retail marketing for menthol cigarettes and its relationship with neighborhood demographics in a nationally representative sample of tobacco retailers. In 2015, data collectors recorded the presence of any exterior menthol advertising, Newport pack price, and any advertised discounts for menthol versions of Newport, Camel and Marlboro at 2,124 tobacco retailers. Multilevel linear and generalized linear models were used to examine these outcomes as a function of census tract demographics, controlling for store type and US region. Tract characteristics were ranked into quartiles, ordered from lowest to highest percentage of youth, Black, Asian/Pacific Islander, and Hispanic residents; median household income was ordered from highest to lowest. More than one-third (38%) of retailers advertised menthol on their store exterior. This was more common in neighborhoods in the second (OR 1.5) and fourth (OR 1.9) quartiles of Black residents as compared to the lowest quartile. Similarly, menthol advertising was more common in the third (OR 1.4) and lowest (OR 1.6) income quartiles as compared to the highest quartile. More stores advertised discounts for menthol varieties of Marlboro (50%) and Camel (48%) than Newport (28%). Newport discounts were more common in neighborhoods with the highest quartile of Black residents (OR 1.8) and that pattern was unique to the brand. Newport cost less in neighborhoods in the highest quartiles of Black residents ($B = -0.15$), youth ($B = -0.09$), and in lower income quartiles ($B = -0.16$). In summary, a pattern of discounts in neighborhoods with more Black residents appears unique to Newport. This is the first national study to confirm lower price for Newport in neighborhoods with more youth. Menthol marketing studies should incorporate multiple brands, and flavor restrictions may address disparities in marketing.

56-T

Feminine traditions: exploring social and behavioral profiles of Haitian women at risk for HPV-infection and related cancer.

Moise RK, Baker Bispo JA, Seay JS, Kobetz EK

Background: Cervical cancer disproportionately burdens Haitian women compared to other populations in the Western hemisphere. Certain agents used during 'twalet deba', a Haitian Creole term for vaginal hygiene practices (VP), have been associated with human papillomavirus (HPV) infection and cervical dysplasia. Namely, use of pigeon pea as a VP agent has been identified as a potential link to high-risk HPV infection. Thus, we sought to further examine social and behavioral profiles of Haitian women who report pigeon pea as a VP agent. **Methods:** Community Health Workers administered surveys on VP to N=464 women from two neighborhoods in rural Thomonde, Haiti in effort to address cervical cancer burden in Haiti through community-based participatory research (CBPR). Univariate and multivariate logistic regression models were used to assess the association between self-reported use of pigeon pea with social and behavioral characteristics including tobacco use, initiation of VP, daily frequency of VP, and number of pregnancies, controlling for age, employment, and education. **Results:** Of the sample, 44.4% of women reported using pigeon pea for twalet deba practices and 15.8% reported present use of tobacco. The majority of the sample was 31+ (85.9%), unemployed (86.1%), and reported completing some formal education (63.0%). Current tobacco use (OR=2.92, 95%CI=1.72, 4.97), older age (OR=1.96, 95%CI=1.12, 3.45), later VP initiation (OR=6.22, 95%CI=4.07, 9.49), higher VP frequency (OR=1.55, 95%CI=1.06, 2.26), and higher number of pregnancies (OR=1.08, 95%CI=1.01, 1.15) were significantly related to pigeon pea use in univariate analyses. After controlling for age, employment, and education, women who reported present tobacco use (OR=3.47, 95%CI=1.84, 6.53); initiation of VP during sexual debut or after marriage (OR=7.02, 95%CI=4.42, 11.13) compared to childhood; and frequency of VP more than twice daily (OR=2.03, 95%CI=1.29, 3.18) were more likely to report use of pigeon pea. **Conclusion:** Numerous factors may influence the disproportionate burden of HPV-infection and related cancer in Haitian women. Results suggest the need to further examine risk pathways, including qualitative analysis, to develop culturally based understanding of twalet deba practices.

Poster Session Abstracts

57

Patient centered medical homes and colorectal cancer screening in Hispanic and non-Hispanic White Medicaid patients

Mojica CM, Davis M, Bradley S, Lind B, Gu Y

Background Screening for colorectal cancer (CRC) remains widely underutilized despite CRC being the 3rd leading cause of cancer death in the U.S. Only 36% of Medicaid recipients, compared to 62% of eligible U.S. adults, are up-to-date with CRC screening guidelines. This study explored the effect of patient centered medical homes (PCMH) and race/ethnicity on CRC screening among Medicaid recipients.

Methods We obtained Oregon Medicaid data (2013-2015) that included monthly enrollment, demographics, and claims data for all medical encounters. Inclusion criteria were: newly eligible for CRC screening (age 50 between January 2013 to June 2014), continuously enrolled in Medicaid (for 11 months following the 50th birthday), and alive during the study period. Excluded members were those dually enrolled in Medicare and with end-stage renal disease. We used logistic regression to examine the effect of PCMH on receipt of any CRC screening (colonoscopy or stool blood test) and on screening modality. We examined interaction effects of PCMH and race/ethnicity on both outcomes.

Results We analyzed data for 3,256 Medicaid patients: 88% White and 12% Hispanic. Overall, 22.8% received any CRC screening. Among those screened, 67% (n=498) received a colonoscopy and 33% (n = 242) a stool blood test. Patients were attributed to 443 primary care clinics: 60% were designated as a PCMH. Analyses revealed that patients attending PCMH clinics had lower odds of any CRC screening compared to patients in non-PCMH clinics (OR 0.80; CI .67-.96). Other significant variables included patients with > 1 comorbid condition and number of clinic providers. There was no effect of PCMH status on screening modality. There was a significant interaction of race and gender with screening modality (OR 0.41; CI .23, .74) but not with any CRC screening (OR .07; CI 0.4, 1.04).

Conclusion Although PCMH clinics have the potential to decrease barriers to CRC screening, being a patient in a PCMH clinic did not result in higher CRC screening for our Medicaid population. Our results add to the mixed evidence in the literature regarding the benefits of PCMH with respect to CRC screening. Further research might examine specific features of a PCMH to determine which specific components, if any, are most effective

58-T

Gaps in Health Insurance Coverage: How do they affect cancer screening?

Muthukrishnan M, Arnold LD, James AS

Insurance instability is defined as a gap or change in health insurance coverage. Although research historically treats insurance status as a dichotomous variable (insured/uninsured), many low-income people cycle on and off insurance. Thus, longitudinal studies that treat insurance as a constant variable may oversimplify the association between insurance status and health behaviors/outcomes. The goal of this analysis is to examine insurance instability over a 12-month period and characterize the effect of this instability on colorectal cancer (CRC) screening. Eleven federally qualified health centers participated in a cluster-randomized trial to promote CRC screening. Surveys assessed insurance status and CRC screening at baseline (n=483), 6-months, and 12-months. At baseline, 71.6% (346/483) were insured. Only participants who completed the 12-month follow-up were included in this analysis (n=273). By the 12-month follow-up, 16.1% (n=44) reported insurance instability. One-quarter of those had two status changes. Overall, 65.6% reported up-to-date CRC screening at 12 months (vs. 56.0% at baseline). Those with insurance instability were less likely to have CRC screening: ever screened (59.1% vs. 75.5%) or up-to-date (50.0% vs. 68.6%). Main reasons for lost insurance coverage included: Loss or change of job (n=23), too high costs (n=16), or never having insurance (n=21). Compared with those with continuous insurance coverage, participants with insurance instability are less likely to receive CRC screening. While we are limited by our small sample size when the data is broken down, we do know that insurance instability affects healthcare utilization. Studies that consider insurance status must focus not just on a point in time (e.g. start of the study) but also on stability of coverage over time. Individuals with insurance changes should be considered part of a vulnerable population, as this instability can affect their access to health services in ways beyond traditional barriers, such as transportation and availability of care. For this reason, it is important to be aware of insurance instability when working with patients, particularly those at FQHCs, to provide preventive and clinical services.

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Using Decision Support and Navigation to Increase Colorectal Cancer Screening among Hispanic-Latino Primary Care Patients

Myers RE, Stello B, Daskalakis C, Sifri R, DiCarlo M, Johnson M, Shaak K

Background: Colorectal cancer (CRC) screening rates are low among Hispanic primary care patients who are 50 to 75 years of age. Effective interventions are needed to raise these rates.

Methods: The research team consented 400 Hispanic patients from five primary care practices of the Lehigh Valley Health Network (LVHN) in southeastern Pennsylvania who were eligible for, but were not up to date with CRC screening. We randomized participants either to an SI Group (n=203) or a DSNI Group (n=197). Both groups were sent a CRC screening kit with instructions in English and Spanish (an informational booklet on screening, a stool blood test (SBT), and colonoscopy screening instructions). The DSNI Group also received a telephone call from a bilingual patient assistant (navigator) who reviewed the booklet with each recipient, determined the individual's preferred screening test and likelihood of adherence, and helped the participant implement a personal screening plan. Follow-up survey and medical records data were used to assess 12-month overall and test-specific screening adherence, screening decision stage, and knowledge and perceptions about screening.

Results: CRC screening adherence was significantly higher in the DSNI Group than the SI Group (OR = 4.83). The DSNI Group, compared to the SI Group, also displayed a higher SBT screening rate (OR = 4.20), a higher colonoscopy screening rate (OR = 8.79), and a higher screening decision stage (OR=4.91). There were no significant study group differences in participant screening knowledge or perceptions.

Conclusions. The DSNI strategy had a substantially greater positive impact on CRC screening adherence than the SI approach.

60-T

Reproductive, anthropometric and lifestyle factors in relation to Mammographic Breast Density in Hispanic Caribbean Women

Oskar, S, April-Sanders, A, Rodriguez, CB, Tehranifar, P

Mammographic breast density (MBD), has been linked to many risk factors for breast cancer (BC) in mostly European and U.S. white populations, but remains understudied in many countries and non-white racial/ethnic groups including Hispanic Caribbean women. We investigated the associations of BC risk factors with MBD in 328 Hispanic women who were born or had parents born in a Caribbean country (age range: 40-64, 81% born in the Dominican Republic). We interviewed women with no history of BC at the time of screening data on BC risk factors, measured women's height and weight, and assessed MBD from digital mammograms using Cumulus software in absolute (dense area, cm²) and relative (percent density) scales. In multivariable linear regression models, height ($\beta=0.3$, 95% CI 0.1, 0.5), lower parity (1-2 vs ≥ 3 births $\beta=3.9$, 95% CI 1.1, 6.8) and benign breast disease ($\beta=2.9$, 95% CI 2.7, 14.0) were associated with higher percent density (PD). In contrast, age at mammogram ($\beta=-0.3$, 95% CI -0.6, 0.0), postmenopausal status ($\beta=-5.6$, 95% CI -9.8, -1.3), and hormonal birth control use after first birth ($\beta=-4.3$, 95% CI -8.0, -0.7) were associated with lower PD. These associations, as well as a positive association for family history of BC, were also observed for dense area ($\beta=16.5$, 95% CI 6.3, 26.6). Increasing BMI was associated with lower PD ($\beta=-0.6$, 95% CI -0.8, -0.3), but was associated with larger dense area even after adjusting for nondense breast area ($\beta=1.2$, 95% CI 0.5, 1.9). Overall, we found similar associations for most BC risk factors for both relative and absolute measures of MBD that are consistent with prior research on MBD and with research on the associations of these risk factors with BC risk. However, the associations for BMI and reproductive factors related to parity, and hormonal birth control use are inconsistent with prior research. The results may suggest that familial, early life and endogenous hormonal factors, but not lifestyle, reproductive and exogenous hormonal factors, influence BC risk via MBD in Hispanic Caribbean women. Additional research in populations with different risk factor profiles can shed light on elucidating common and unique processes underlying MBD distribution and inform primary prevention strategies.

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RNA Splicing Regulatory SNPs Associated With Prostate Cancer Racial Disparities

Freedman JA, Wang Y, Li X, Liu H, Moorman PG, George DJ, Lee NH, Hyslop T, Wei Q, Patierno SR

Racial differences in prostate cancer (PCa) aggressiveness and mortality are significant. These disparities persist after adjustment for social determinants of health, suggesting genetic factors make an important contribution to such disparities. Dysregulation of RNA splicing can drive cancer. We identified differences in expression of RNA splice variants between African American (AA) and white PCa, and the functional significance of AA-enriched variants to PCa aggressiveness. A subset of variants were also present in the patient's adjacent normal prostate, suggesting germline origination of differential RNA splicing as a novel mechanism of race-related PCa aggressiveness. Single nucleotide polymorphisms (SNPs) in splicing regulatory regions of these genes have the potential to drive the RNA splicing. Using genome-wide association study data, we evaluated associations between SNPs in race-related differentially spliced genes and related oncogenic signaling networks and PCa risk, aggressiveness and survival, and performed in silico bioinformatics to predict SNP function. We identified SNPs in stemness-related genes that were associated with PCa risk, with SNPs showing heterogeneity in susceptibility between African descendants and non-Hispanic whites and SNPs only in African descendants. A number of these SNPs were predicted to regulate RNA splicing. We also identified SNPs in the genes that were associated with PCa survival in non-Hispanic whites and predicted to regulate RNA splicing. Finally, we identified associations between SNPs in race-related differentially spliced genes functioning in sustaining proliferation, deregulating cellular energetics, resisting cell death, inducing angiogenesis, activating invasion and metastasis and tumor-promoting inflammation that associate with PCa risk and aggressiveness in non-Hispanic whites and African descendants, and survival in non-Hispanic whites. All of these SNPs were predicted to regulate RNA splicing. This work elucidates predicted RNA splicing regulatory SNPs that associate with PCa risk, aggressiveness and/or survival. Our findings will contribute to understanding aggressive PCa biology and PCa racial disparities and to precision medicine by informing individualized risk prediction models for PCa aggressiveness.

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Ensuring diversity in cancer research participation by using culturally appropriate modalities

Reyes A, Schmitt, KM, Sandoval R, Abdul K, Cruz A, Hillyer GC

It has been long understood that minorities are underrepresented in research. Our efforts focus on the diverse populations of Washington Heights/Inwood (WHI), in North Manhattan. This area is home a population that is 27% below the federal poverty line, 71% Hispanic, 48% foreign born, and 39% have limited English proficiency while 22% report no health insurance, and 16% report inadequate medical care. Cancer ranks 2nd in causes of death. (NYC.gov Community Health Profiles 2015). The Community & Ambulatory Research & Enrollment (CARE) Shared Resource of the Herbert Irving Comprehensive Cancer Center, (HICCC), was created to ensure that research cohorts at our cancer center are representative of our community. We provide a centralized, multidisciplinary, culturally sensitive and efficient resource for recruiting human subjects to participate in research. We enhance the quality and effectiveness of cancer prevention research and ensure diversity in study participation by culturally matched recruitment, low literacy translations, literacy testing of research tools, and community education. Subject demographics on enrollment and refusals are evaluated and utilized to eliminate barriers to study enrollment. Culturally appropriate community education workshops prepare potential research subjects for clinical trial participation. Information disseminated is translated and tailored for low literacy populations. Our efforts have resulted in a direct impact to research at our cancer center. We have achieved great success in the promotion of community participation in research. With 45 study partners, studies have been streamlined, and documents made more understandable to community. Additionally, 77% of subjects enrolled by CARE are minorities. In our community Cancer Genetics Education Program, 75% reported intention to participate research, and nearly all participants stated the information provided could assist them in making better healthcare decisions. Our results demonstrate a significant increase in research understanding and participation as a result of linguistically and culturally appropriate research materials and study designs, and recruiters and educators that are culturally matched to the population.

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Immune Response to HPV4 Among Appalachian Women Age 18-26 Years: Impact of Behaviors and Stress

Ruffin MT, Hade, EM, Harper DM

Context: Appalachian women suffer a disparate burden of cervical cancer even with adequate cervical cancer screening. There is local belief that they will not respond to the HPV vaccine due to the stresses of their lives.

Objective: We hypothesized Appalachian women's immune response to the quadrivalent HPV vaccine three shot series will be blunt by stress which will be mediated by other variables.

Design: Cohort Setting: Patients recruited from primary care offices in Appalachian Ohio to an HPV vaccine trial. Participants: Women 18-26 years not previously received HPV vaccine. Women were excluded if had any ablative treatment of the cervix. All participants had to be willing to complete the quadrivalent HPV vaccine three shot series. Instruments: 14-item Perceived Stress Scale (PSS), CES-D, Appalachian self-identity and Health Behaviors (smoking, sex).

Outcomes: Serum HPV titers for HPV 6, 11, 16, 18 at baseline, month 2, month 6, and month 12. Results: Study population of 185 was 85.4% white. At baseline 50.3% of the women were cervical HPV DNA positive. At baseline 19% of participants were HPV 16 sero-positive; 8.7 % were HPV 18 sero-positive; 19.5% were HPV 6 sero- positive; and 5.4% were HPV 11 sero-positive. By month 12, 100% of study participants were sero-positive for HPV 6, 11, and 16. 93.2% were sero-positive for HPV 18. There was no relationship to immune response by demographics, BMI, smoking, PSS, CES-D, baseline HPV serology status, baseline cervical HPV DNA status, baseline serum EBV titers, or Appalachian self-identity.

Conclusion: Appalachian women immune response to the quadrivalent HPV vaccine three shot series was not blunted by stress or any other measures collected. The population at higher risk for cervical HPV infection and cervical cancer benefit from the HPV vaccine series.

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HPV Self-Sampling for Cervical Cancer Screening among Female Firefighters

Schaefer Solle, N., Caban-Martinez, A.J., Lee, D., Koru-Sengul, T., Kobetz, E.

Purpose: Despite heightened concern that firefighters may have an increased cancer risk, few studies have examined the cancer prevention strategies pertinent to female firefighters; this study aims to circumvent the barriers of shift work with the implementation of a Human Papillomavirus (HPV) self sampler in a sample of active female firefighters in Florida.

Methods: Female firefighters were recruited from their departments during station visits and cancer education seminars. Women completed eligibility screeners and informed consent prior to participation. If eligible, women received a HPV self-sampler to complete at home or at the fire station. Specimens were returned to the lab for analysis. HPV results were given over the telephone and those who screened HPV positive were referred for follow-up care with their primary physician.

Results: A total of 251 female firefighters were screened for eligibility, of whom 31 (12.3%) were eligible and interested in participating. Self-sampling kits were sent to 31 of the eligible subjects; 14 (45.0%) participants returned the kits, and 1 (7.0%) received a positive HPV result. Participants felt self-sampling was easy to self-administer and would repeat the use of the self-sampler as per national screening guidelines.

Conclusion: Female firefighters who completed the self sampling kit in this pilot study reported preference for work-site based education and screening options as compared to a traditional women's health exam with a healthcare provider. Further strategies to increase cancer screening among female firefighters engaging in shift work may be helpful in reducing the cervical cancer burden in the fire service.

Poster Session Abstracts

65-T

Use of Smoking Cessation Quitlines Among Participants Reporting Quit Attempts in the Past Year: Results from the US International Tobacco Control Survey.

Sharma A, Kasza KA, Bansal-Travers M, Hyland AJ, O'Connor RJ

Smoking cessation quitlines (QL) are an evidence-based intervention that help people quit smoking. Despite their proven effectiveness, utilization of QL is historically low. This study examines if utilization of QL in the US has been changing over time and which factors are associated with QL calling. Data come from waves 5-8 (2007-2011) of the International Tobacco Control Four Country (ITC-4C) survey. Random-digit dialing was used to recruit adult (age 18+) current smokers (i.e., reported smoking at least 100 cigarettes in their lifetime and smoking at least once in the past 30 days). Participants were invited to participate in the subsequent survey wave. Participants who reported a quit attempt in the 12 months prior to their survey date were asked "In the last 12 months, have you received advice or information about quitting smoking from telephone or Quitline services?" Generalized estimating equations (GEE) were used to examine associations between wave of the ITC survey and QL calling using SPSS version 21. Overall, QL utilization was low but increased over the course of the study period, from 6.8% in 2007 to 12.4% in 2011. Multivariate GEE models adjusted for demographics (age, gender, education, income, race/ethnicity), stop smoking medication use, self-reported health status, and cigarettes per day. The odds ratio (OR) for calling a QL in wave 6 of the ITC-4C relative to the referent (wave 5) was = 1.12 (95% CI: 0.79, 1.58), the OR for wave 7 = 1.56 (95% CI: 1.09, 2.25), and in wave 8 OR = 1.83 (95% CI: 1.27, 2.63). Therefore, the odds of calling a QL were significantly higher in wave 7 and wave 8 compared to wave 5. Individuals in the low income category were significantly more likely to report calling a QL compared to those in the high income category OR = 1.68; (95% CI: 1.16, 2.42). Individuals of other races/ethnicities were also more likely to call the QL OR = 2.09; (95% CI: 1.47, 2.96) compared to Non-Hispanic Caucasians. QL use increased in the US between 2007-11, with higher use reported among those with lower incomes who can least afford additional cessation help; however, QL remain an underutilized resource. Efforts should be directed at boosting QL utilization using proven strategies such as paid advertising and marketing.

66-T

Multilevel Approaches Needed to Address Medical Mistrust in Black Women at Risk of Hereditary Breast and Ovarian Cancer

Sutton, AL, He, J., Tanner, E, Edmonds, MC, Henderson, A, Hurtado de Mendoza, A, Sheppard, VB

Background: The benefits of genetic counseling and testing (GCT) for hereditary breast and/or ovarian cancer (HBOC) are well documented; however, Black women are less likely to use these services compared to White women. Mistrust of the medical system has been associated with Black women's underuse of GCT. However, relatively little is known about the factors that increase a woman's likelihood to have higher medical mistrust.

Methods: A convenience sample of 94 Black women at increased risk of HBOC were recruited to examine the prevalence of medical mistrust to assess whether sociodemographic (e.g. age, education), sociocultural (e.g. religiosity, fatalism), and psychosocial (attitude toward GTC, self-efficacy in accessing GCT) factors contribute to levels of mistrust. Categorical variables were calculated according to Chi-Square, while the F-test was employed for continuous variables. The Lasso method of linear regression assessed the relationships between the independent variables and medical mistrust.

Results: Most women were married (48.7%) and had at least some collegiate education (57.1%). Levels of mistrust ranged from moderate (16) to high (35); $m=24.9$, $SD=3.9$. Sociodemographic factors were not associated with medical mistrust in bivariate analysis, but fatalism ($p=0.04$), perceptions of discrimination ($p=0.01$), and self-efficacy in accessing GCT ($p=0.01$) were. In multivariable analysis, women who reported higher levels of discrimination ($\beta=0.80$) and less confidence in obtaining GCT ($\beta=-0.33$) expressed greater medical mistrust.

Conclusion: Mistrust of the medical system was common among this group of Black women at increased risk of HBOC; mistrust did not vary by demographic factors. There is a continued need to address structural barriers, such as perceived race-based discrimination in healthcare, to address medical mistrust. Additionally, education about accessing GCT services may enhance women's confidence in GCT, therefore reducing levels of mistrust. Interventions that target multiple levels of influence may help mediate levels of medical mistrust and in turn enhance uptake of GCT in this at-risk population.

Poster Session Abstracts

67-T

HPV vaccination coverage among U.S. teens across the rural-urban continuum

Swiecki-Sikora, AL BA; Kepka, D PhD; Henry, K PhD

Purpose: A majority of studies examining HPV vaccination uptake in urban versus rural areas used measures of rural and urban based on county data. We analyzed data from the National Immunization Survey-Teen (NIS-Teen) to examine associations between HPV vaccination uptake and rural and urban residence measured at the zip code level.

Methods: Data from the 2012-2013 NIS-Teen were used to examine associations of HPV vaccination initiation (≥ 1 dose) and series completion (≥ 3 doses) among boys and girls aged 13-17 years with ZIP Code Tabulation Area (ZCTA) measures of urban and rural based on Rural Urban Commuting Area Codes (RUCAs). Multivariable logistic regression including individual and ZCTA poverty was used to estimate the odds of HPV vaccination initiation and completion.

Results: HPV vaccination coverage was lower among girls from isolated small rural towns (≥ 1 dose 51.0%; ≥ 3 doses 30.0%) and small rural towns (≥ 1 dose 50.2%; ≥ 3 doses 26.8%) as compared to urban areas (≥ 1 dose 56.0%; ≥ 3 doses 35.9%). In multivariable models, rural/urban residence was not statistically significantly associated with HPV vaccination initiation. However, girls from small rural towns had lower odds of completion (0.74, 95% CI 0.60-0.91) than girls from urban areas had. HPV vaccination was lower among boys from isolated small rural towns (≥ 1 dose 17.3%; ≥ 3 doses 5.3%) and small rural towns (≥ 1 dose 18.7%; ≥ 3 doses 5.5%) than in urban areas (≥ 1 dose 28.7%; ≥ 3 10.7%). In multivariable models, boys in isolated small rural towns had statistically significantly lower odds of initiation (0.68, 95% CI 0.52-0.88) and completion (0.63, 95% CI 0.41-0.97) compared to boys from urban areas. This relationship was similar for boys from small rural and large rural towns. Interactions between rural/urban and ZCTA poverty indicated significantly lower odds of initiation and completion for girls and boys from high-poverty rural areas than for their counterparts from high-poverty urban areas.

Conclusion: Lower levels of HPV vaccination rates in rural areas may be attributable to less access to health-care programs for the poor, access to public transportation, and different cultural values than urban populations have. Public health vaccine programs should focus on the rural poor.

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Gender-linked disparities in tobacco use between male-to-female and female-to-male transgender individuals

Tami-Maury I, Sharma A, Shete S.

Introduction: Transgender is an umbrella term for a diverse group of individuals whose gender identity is different from the sex assigned at birth. Because of social stigma surrounding gender identity or expression, male-to-female (MTF) and female-to-male (FTM) transgender individuals often experience discrimination and harassment leading to negative health outcomes. Our objective was to investigate differences in smoking-related gender health disparities within a sample of transgender individuals in Houston, Texas.

Methods: A sample of 104 transgender individual seeking care at a transgender clinic located in Houston, Texas completed a 20-item survey examining tobacco use and other health-related risk factors. Chi-squared statistics, Fisher's exact test, and t-test were used to assess differences between MTF and FTM transgender individuals. Additionally, logistic regression models examined multivariable associations between demographic and behavioral risk factors associated with current cigarette smoking.

Results: Among the 104 transgender individuals, 45 (43%) were FTM and 59 (57%) were MTF. In terms of race/ethnicity: 41% were White, 19% African-American, 26% Latino, and 14% other races/ethnicities. Top three health issues included: healthcare providers' knowledge about LGBT issues (50%), suicide (45%), and access to healthcare (42%). Current smoking prevalence among FTM transgender individuals (29%) was statistically significantly higher than that of MTF transgender individuals (12%). After controlling for age, gender identity (FTM vs.MTF), race/ethnicity, education, history of mental health conditions (e.g., anxiety and/or depression), employment, health insurance status, and being out to healthcare provider, those who were FTM transgender individuals ($p<0.05$) and did not have any kind of health care coverage ($p<0.05$) were statistically significantly more likely to be current smokers.

Conclusions: Findings from our study revealed that FTM transgender individuals bear a disproportionate burden of cancer morbidity and mortality related to tobacco use. Future research efforts should increase awareness of tobacco use in the transgender population.

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Patterns and determinants of abnormal cervical cancer screening follow-up and invasive cervical cancer among uninsured and underinsured women in New Jersey

Tsui J, Llanos AAM, Doose M, Rotter D, Africa C, Stroup A.

Purpose: Lack of timely and appropriate follow-up care after receipt of an abnormal Pap result have been attributed to higher invasive cervical cancer (ICC) incidence and mortality rates among underserved women. We examined healthcare environment-related determinants of follow-up care and diagnosis of ICC among uninsured and underinsured women in New Jersey to inform system-level strategies for care improvement.

Methods: We conducted a retrospective cohort study of women in the New Jersey Cancer Education and Early Detection (NJCEED) Program with at least one Pap test between 2000 and 2015 (n=90,322). Data from the New Jersey State Cancer Registry (NJSCR) on ICC cases were linked to the NJCEED cohort data. Using generalized estimating equations for clustering at the county level, we examined the association between healthcare facility, area-level characteristics, and individual sociodemographic factors on receipt of an abnormal Pap test, receipt of any follow-up care, treatment delays, and diagnosis of ICC.

Results: The majority of women in the NJCEED cohort were ≥ 40 years (73%), racial/ethnic minorities (74%), and foreign-born from Central/South American or Caribbean countries (69%). Of the 9,688 women with at least one abnormal Pap test, 36% required follow-up and 13% never received follow-up. The odds of not receiving follow-up care after an abnormal Pap test were independently associated with screening facility type, country of birth, number of prior Pap tests, prior NJCEED encounters, and neighborhood-level unemployment. A total of 185 NJCEED participants were diagnosed with ICC and 42% (n=77) were cases with ≥ 1 abnormal Pap test that required follow-up.

Conclusions: Although the majority of NJCEED participants received timely treatment, we observed significant variation in the receipt of needed follow-up care, delays in care, and ICC diagnosis by screening facility type and place of care, which are healthcare system related factors that have been inadequately examined in prior studies. Even with the implementation of patient navigation services, multilevel barriers to appropriate follow-up care continue to persist and warrant localized focus within the healthcare system.

70-T

Trends in premature cancer mortality in the USA by race/ethnicity and county-level demographic factors

Withrow DR, Berrington de Gonzalez A, Freedman ND, Shiels MS

PURPOSE: Cancer is the leading cause of premature mortality in the USA, accounting for >25% of all deaths among persons aged 25-64. We aimed to describe trends in premature cancer mortality rates by race/ethnicity and county-level socioeconomic attributes.

METHODS: The study included deaths from 1999-2014. Death certificate data and population denominators were from the US National Center for Health Statistics and Census Bureau, respectively. We estimated the age-adjusted premature cancer mortality rate per 100,000 person-years and the annual percent change (APC) in these rates by race/ethnicity (white, black, Hispanic, and Asian/Pacific Islander [API]) and quintiles of county-level attributes (median income, % unemployed, % Bachelor's degree).

RESULTS: Premature cancer mortality rates varied significantly by race/ethnicity with highest rates among blacks (114/100,000 in 2014) and lowest among APIs (52/100,000). Racial/ethnic groups with higher mortality had more rapid improvements in mortality (e.g., APCs: blacks -2.30%/year, [95% confidence interval: -2.38, -2.22] vs. API: -1.55%/year [-1.82, -1.27]). Within black and white sub-populations, persons living in the most advantaged counties had the lowest mortality rates and the most rapid declines in mortality. For example, among whites the premature cancer mortality rates in the highest and lowest income counties were 69 and 106/100,000 in 2014, and the APCs were 2.47%/year [-2.56, -2.37] and -0.94%/year [-1.05, -0.82]. Among blacks, the premature cancer mortality rates in the highest and lowest educated counties were 101 and 125/100,000 in 2014 and the APCs were -2.67%/year [-2.80, -2.53] and -2.11%/year [-2.32, -1.90].

CONCLUSIONS: Premature cancer mortality rates among persons aged 25-64 declined during 1999-2014 and racial/ethnic mortality differences narrowed. Within race/ethnicities, however, county-level differences in premature cancer mortality grew, as the most advantaged counties improved at a faster rate than the least advantaged. Despite widespread cancer mortality declines, there remain substantial and growing disparities between counties with high and low socioeconomic attributes within racial/ethnic groups.

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71-T

"I don't feel like moving": Mediating role of Depression in Risk Factors of Physical Inactivity

Wu IHW; McNeil, L

Objective. Physical inactivity is an important risk factor for cancer. While Americans have become more physically active in the past two decades, only 49% of Americans currently meet the Physical Activity Guidelines for aerobic physical activity. Even more troublesome are the high obesity rates among African Americans in the US partly due to physical inactivity. In addition to high rates of obesity, African Americans are also uniquely exposed to racial discrimination and segregated neighborhoods that can decrease health behaviors and increase risk for depression. However, this group continues to be overlooked in the research community. Thus, the current study seeks to examine how perceived racial discrimination and perceived neighborhood problems impact depression and physical activity.

Methods. The participants were a community sample of African Americans (n = 362) recruited from a large southern mega-church who were asked to complete a self-report questionnaire related to perceived neighborhood problems (e.g., litter on the streets, graffiti), perceived neighborhood safety (e.g., "I look over my shoulder when walking down the street"), depression (CES-D), physical activity (IPAQ) and sedentary behaviors (e.g., time spent watching TV or on the computer).

Results. Structural equation modeling showed that higher levels of racial discrimination and neighborhood problems were related to higher levels of depression; and higher levels of depression were related to less physical activity and greater sedentary behavior. Further, indirect effects showed that depression fully mediated the effect of racial discrimination and neighborhood problems on physical activity and sedentary behaviors.

Conclusion. The results supported the hypothesis that depression mediates the relationship between individual and neighborhood level stressors and health behaviors. The implications highlight the need for researchers, practitioners, and policy makers to consider the important role of mental health in cancer prevention.

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Prostate Cancer Treatment and Survival in Pennsylvania: The Influence of Age at Diagnosis

Bluethmann SM; Wang M; McDonald A; Chen C; Zaorsky NG

Purpose: To assess age-related cancer treatment patterns in Pennsylvania prostate cancer survivors and the potential impact on survival.

Methods: We used Pennsylvania Cancer Registry data to identify men ≥ 40 years with a clinical diagnosis of prostate cancer (Gleason Score ≥ 6) between 2004-2014. We compared, demographic and clinical descriptors (including race/ethnicity, rurality, disease aggressiveness) by age < 65 ("younger") v. ≥ 65 years ("older"). Prostate cancer aggressiveness was based on Gleason Score (GS) and tumor stage (less aggressive=GS 6-7 and T1-T2; more aggressive=GS 7-10 or T3-T4). Treatment was categorized as local only (radiation and/or surgery) v. systemic (local plus hormonal therapy and/or chemotherapy) treatment. Logistic and Cox regression were used to assess the association of covariates with treatment and prostate-cancer death.

Results: Our sample (n=94,262) included survivors ages 40-105 years (mean=66 yrs, SD=0.4). The majority were white (83%) or Black (10%) from urban settings (69%). Most older survivors had aggressive disease (62%) compared to younger survivors (37%). More older survivors (28%) received hormonal therapy than younger survivors (12%), but more (62%) younger survivors received surgery than older survivors (28%). Older survivors were 3 times more likely to receive systemic v. local treatment compared to younger survivors (OR=2.78, $p < .001$; 95% CI 2.6-3), controlling for disease aggressiveness and other covariates. Older men that received systemic treatment had a 28% risk reduction for cancer death compared to younger men that received systemic treatment (HR=0.72, $p < 0.001$; 95% CI 0.60-0.87). For local treatment, the hazards of cancer death were 2.5 times greater for older men than younger men (HR=2.47, $p < .001$; 95% CI 1.94-3.15).

Conclusion: Older survivors were more likely to receive systemic treatment and had better survival than younger men with similar treatment. But, older men that received local treatment only had increased risk of cancer death compared to younger men with local treatment. Given lack of consensus on prostate cancer treatment guidelines and problematic treatment side effects, older survivors may need special consideration in survivorship care. Lifestyle interventions may reduce symptoms and recurrence.

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The impact of diabetes on adherence to breast cancer screening guidelines and breast cancer detection

Boudreau DM, Yu O, Shao H, Gold HT

Background: Over 250,000 women were diagnosed with breast cancer (BC) in 2017, and 20% had Type II diabetes mellitus (DM). Patient with both conditions have poorer outcomes with a 52% increased mortality risk. There is limited information about whether and why outcomes may be worse in women with both BC and DM versus only BC. Early detection of BC through screening reduces morbidity and mortality, but the success of screening and early detection depends on determining whether or not women are screened at regular intervals.

Objective: Assess whether BC patients with DM were less adherent to screening recommendations prior to BC diagnosis, leading to a higher probability of symptom- detected, later-stage tumors than women without DM.

Methods: Retrospective cohort study of 2,054 women 52+ years diagnosed with stage I-IIIa BC during 1999-2014 and receiving care within a large health plan in Washington State with linkage to the SEER tumor registry. Women diagnosed with DM, as determined through the electronic health records on diagnoses, laboratory values, and pharmacy records, were compared to women without DM for: screening mammography or MRI in the 2 years prior to BC diagnosis, symptom-detected BC, and stage of BC. Modified Poisson regression with robust standard errors adjusting for age, year of BC diagnosis, race, body mass index, and comorbidity index was used to estimate relative risks (RR) and 95% confidence intervals (CI).

Results: Approximately 13% of women in the cohort had DM. Receipt of a screening mammogram in the two years prior to BC was similar between the two groups (79% of women with DM; 77% of women without DM) for a RR = 1.05 (95% CI, 0.98 – 1.13). Women with DM were less likely to be symptom- vs screen-detected for BC than women without DM (45% vs. 50%); RR=0.93; 95% CI, 0.80-1.07). Diagnosis of stage IIIa vs. stage I-II was similar between the groups (6.8% both groups; RR=1.0; 95% CI, 0.59-1.59).

Conclusion: This study does not support the hypothesis that differences in BC screening rates, symptom-detected cancers, and stage at diagnosis explain poorer outcomes among women with DM. The study was conducted in one health system and warrants replication in other setting and populations.

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A simple risk prediction model for high-risk adenomatous polyps at the time of colonoscopy

Boyne DJ, Lix LM, Hilsden RJ, Brenner DR

Introduction: The prediction of high risk adenoma polyp (HRAP) may help to prioritize the urgency and guide the performance of colonoscopy procedures. Our objective was to develop and internally validate a simple, scalable clinical prediction model.

Methods: The study population consisted of 2,364 individuals aged 50 to 74 with no prior history of cancer who had a screening colonoscopy at the Forzani and MacPhail Colon Cancer Screening Centre in Calgary, Canada. A total of 190 HRAPs were identified (8.0%). Predictor variables were collected from a baseline health questionnaire and included patient demographic (age, sex, and ethnicity), lifestyle (body mass index, alcohol (daily vs. no), smoking (never vs. ever), physical activity (high vs. moderate to low), and non-steroidal anti-inflammatory drug use (yes vs. no)), medical (family history of colorectal cancer, personal history of diabetes, or fecal occult blood test within the past two years), and female-specific characteristics (menopausal status and hormone replacement therapy (yes vs. no)). The demographic variables were first used to create a baseline model and the benefits of adding the groups of lifestyle, medical, and female-specific variables into the model in various combinations was assessed. Five-fold internal cross validation was conducted. Performance was assessed using the C-statistic and Hosmer-Lemeshow goodness-of-fit test.

Results: The average age of the participants was 58 years of whom 54.9% were male and 85.24% were Caucasian. The clinical prediction model included demographic and lifestyle variables. On average, the predicted probability of having a HRAP was 8.0% (IQR: 4.1% to 10.6%). The bias-adjusted C-statistic was 0.66 (95% CI: 0.62 to 0.70) and there was no evidence of a lack of calibration according to the Hosmer-Lemeshow goodness-of-fit test. The addition of the medical history variables (Δ AUC=+0.0001; p=0.98) or female-specific variables (Δ AUC=+0.006; p=0.32) or both medical and female-specific groups of variables (Δ AUC=+0.004; p=0.45) did not improve predictive performance.

Conclusions: A model based on demographic and lifestyle variables showed a modest predictive ability for having an HRAP at the time of colonoscopy in a population undergoing screening-related colonoscopies.

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75-T

Examining Predictors of Diagnosed Malignant Neoplasms of the Female Genital Tract in Emergency Department Settings

Brown VG, Cofie L, Hirth JM, Berenson AB

Purpose Very few studies have examined cancer diagnoses in emergency departments (EDs) using national data among women, although these facilities are sometimes used as an alternative to primary care. The purpose of this study was to examine predictors of diagnosed malignant neoplasms of the female genital tract in EDs among women who have visits related to reproductive healthcare.

Methods This retrospective repeated cross-sectional study used data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) between 2009 and 2013. This survey, which comprises a national probability sample of visits to emergency departments of 600 non-institutional hospitals, was conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics. We included all women who were more than 15 years of age and had visits to EDs seeking reproductive healthcare services. Patient information was weighted to account for non-response and sampling bias. Bivariate analyses were conducted between demographic variables and frequency of diagnosis with malignant neoplasms using chi-square tests. Multinomial logistic regression was used to control for potential confounders to examine associations between reasons for visits to EDs and malignant neoplasm diagnoses using SAS® Statistical Software Version 9.4 (Cary, NC).

Results A total of 2,620 women were included in the study. Five percent (n=140) were diagnosed with a malignant neoplasm during an ED visit of which the majority were malignant neoplasms of the uterus. Associations between increased age group ($p<0.001$) with diagnosis of malignant neoplasm as well as type of diagnostic services performed ($p<0.001$) with malignant neoplasms were observed. The likelihood of being diagnosed with malignant neoplasms was more than twenty times greater among women presenting to the ED with complaints of uterine fibroids (aOR: 21.5, 95% CI: 4.58, 101.1).

Conclusions This study revealed that, among women who sought reproductive healthcare in EDs, those who presented with uterine fibroids were more likely to be diagnosed with a malignant neoplasm. Further studies are warranted to examine how safety net healthcare facilities may function as an alternative to women seeking reproductive healthcare in an ED.

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Preliminary results regarding patient uptake and satisfaction of an alternative model for cancer risk genetic testing

Cadet K, Westerman JS, Trottier MD, Breen KE, Catchings A, Salo-Mullen EE, Cadoo K, Carlo MI, Robson ME, Hamilton JG

Providing efficient, time-sensitive clinical genetic testing to cancer patients may be an important factor in guiding therapy and has preventive implications for patients and their families. Memorial Sloan Kettering is evaluating an alternative streamlined testing model involving pre-test education by a non-genetic healthcare provider in the form of a written brochure and narrated video with post-test genetic counseling and result disclosure by telephone. As part of an ongoing prospective study to evaluate psychosocial and behavioral implications of this alternative model, we examined patients' uptake and self-reported satisfaction with the decision to undergo genetic testing via this approach. Participants (median age= 65, range= 38-92) were recruited from ovarian (n=40), prostate (n=24), and pancreas (n=4) clinics; to date, only 3 patients have declined testing through this study. Gender was the only sociodemographic factor associated with participants' perceptions of the testing approach. Specifically, females were significantly more likely than males to report that the video presented information that helped them make their decision about whether or not to have genetic testing ($M\pm SD = 3.78\pm 1.00$ vs. $3.10\pm .79$), $t(41)=2.46$, $p<.05$. In addition, on a scale ranging from 1="strongly disagree" to 5="strongly agree", females liked the video ($3.87\pm .63$) and found the video to be significantly more informative ($3.78\pm .70$) than their male counterparts ($3.45\pm .51$ and $3.20\pm .70$, respectively; $t(41)=2.39$ and 2.32 , $ps<.05$). Overall, participants' satisfaction with the decision to have genetic testing (measured with the Satisfaction with Decisions Scale, scale range=4-20) was high (16.75 ± 3.39), and was unrelated to sociodemographic factors including age, gender, and ECOG performance status ($ps>.05$). These preliminary findings suggest that pre-test counseling in the form of an educational video provided enough information for patients to provide consent to genetic testing. Additionally, patients were largely satisfied with their genetic testing decision. Future analyses will help determine the appropriateness of this approach by evaluating patients' perspectives on coping, communication with at-risk family, and knowledge and understanding about their genetic test results.

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Improving adherence to colposcopy referral: Results from interviews with colposcopy adherers and non-adherers

DeNomie MH, Barker M, Ruffalo LA, Schellhase KG

Purpose Researchers partnered with Planned Parenthood-Wisconsin and a family medicine clinic to conduct interviews to explore barriers to, and facilitators of, colposcopy referral adherence.

Methods We recruited clinic patients who had been referred for colposcopy. Interviews were conducted in clinic sites and were audio-recorded, transcribed, and analyzed using open coding to generate grounded theory. Themes were mapped to Bronfenbrenner's (1977) socioecological framework for health at individual, interpersonal, organizational, community, and policy levels.

Results We interviewed 40 women, 33 had had a colposcopy, 7 had not. Themes emerged at all levels of the socioecological model. At the individual level, women expressed that fear of cancer/the procedure, lack of understanding of clinical recommendations, lack of understanding of effectiveness of cervical cancer screening and internal motivations contributed to adherence. At the interpersonal level, key themes included: importance of supportive relationships; desire to stay healthy for one's children; trust for clinician. Procedural factors leading to comfort (privacy during procedure) or discomfort (presence of multiple clinicians and/or clinical learners) were identified as organizational themes. Community level themes included: desire for increased understanding of prevalence of – and elimination of stigma related to – HPV; insurance/transportation barriers. And, policy/systems level themes include the importance of Planned Parenthood and other organizations that improve access to care for un-/underinsured populations.

Conclusions By mapping interview themes to the socioecological model, we demonstrate the complexity of patients' decision-making processes related to adherence to colposcopy referral. Based on these findings, adherence might be improved in the following ways: 1) advocacy for support and funding for organizations that improve access to care for the un-/underinsured; 2) messaging to improve patient knowledge of HPV (and HPV vaccine), and to highlight the effectiveness of cervical cancer screening; 3) improved clinical practices (improved information about HPV, cervical cancer, and colposcopy; procedures that ensure patient comfort during colposcopy).

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A national survey of primary care physicians: perceptions and practices of low-dose CT lung cancer screening

Eberth JM, McDonnell KK, Sercy E, Khan S, Strayer S, Dievendorf AC, Munden RF, Vernon SW

Background: Soon after the National Lung Screening Trial, organizations began to endorse annual low-dose computed tomography (LDCT) screening for lung cancer in high-risk patients. Concerns about the risks versus benefits of screening, as well as the logistics of properly identifying and referring eligible patients for screening, remained among physicians. This study aimed to examine primary care physicians' knowledge, attitudes, referral practices, and associated barriers regarding LDCT screening.

Methods: We performed a weighted, nationally representative survey of primary care physicians between September 2016 and April 2017. Physicians received up to 3 mailings and 1 follow-up email invitation, and received varying incentives to complete the survey. Overall, 293 physicians completed the survey, for a response rate of 13%. Descriptive statistics were used to characterize the participants and their responses.

Results: Over half of the respondents correctly reported that the US Preventive Services Task Force recommends LDCT screening for high-risk patients. Screening recommendations for patients not meeting high-risk criteria varied. Although 75% agreed that the benefits of LDCT screening outweigh the risks, fewer agreed that there is substantial evidence that screening reduces mortality (50%). The most commonly reported barriers to ordering screening included prior authorization requirements, lack of insurance coverage, coverage denials, and transportation and other financial challenges for the patient.

Conclusions: Given the impact of physician recommendations on cancer screening utilization, further education, clinical practice and policy changes are needed to engage more patients in screening discussions and ultimately, increase referrals for LDCT screening among high-risk patients.

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Knowledge, attitudes, willingness to pay, and patient preferences about genetic testing and subsequent risk management for cancer prevention among young Hispanic women

Guo FG, Hirth JM, Fuchs EL, Cofie LE, Brown V, Fernandez ME, Berenson AB

Objective: Knowledge, attitudes, and patient preferences about genetic testing and subsequent risk management for cancer prevention among average risk populations are understudied, especially among Hispanics. This study was to assess these items by conducting an in-person survey in this understudied population.

Methods: We conducted an in-person survey using a self-administered structured questionnaire among young women in UTMB clinics from 5/26 to 7/21, 2017. Survey questions were adapted from other validated surveys. Participants were offered to choose either a paper format or an electronic version on an iPad or their own smartphone. In total, there were 792 completed surveys. By excluding 88 women with incomplete responses to questions about genetic testing, 9 women >50 years old, and 1 with breast cancer, we retained 694 women in the analyses. Most were low-income, Hispanic women on Medicaid.

Results: The mean age of participants was 27.8 years old (95% confidence interval 27.3-28.3), 38.2% were married, 33.0% attended college, and 28.0% did not graduate from high school. There were 333 pregnant women (48.0%), and 535 self-identified as Hispanics (77.1%). These women had low knowledge about genes or breast cancer risk, but most agreed that genetic testing for cancer prevention is "a good idea" (86.8%), "a reassuring idea" (83.2%); and "everyone should get the test" (86.5%). However, for willingness to pay, a high proportion (42.4%) would prefer to pay nothing out of pocket for genetic testing for cancer prevention, 21.8% \$25, and only 6.3% would pay ≥\$500. When asked about a hypothetical scenario of high breast cancer risk, 32.6% said they would choose prevention with medication, 18.6% risk-reducing mastectomy and 11.3% risk-reducing salpingo-oophorectomy. Race/ethnicity and education level were strong predictors for knowledge level, attitudes, and preventive measure choice.

Conclusion: In this low-income, mostly Hispanic population, knowledge about genetic testing and cancer risk is poor, but most have positive opinions about genetic testing for cancer prevention. However, those women's relatively high preference for chemoprevention and low preference for prophylactic surgeries in a hypothetical scenario underscore the importance of genetic counseling.

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Determining the Impact of Breast Density Legislation on the Use of Supplemental Screening in North Carolina

Henderson LM, Nyante SJ, Marsh MW, Benefield TS, Lee SS

Purpose. Mammographic breast density is a known risk factor for breast cancer and makes cancer detection more difficult. Currently, 30 states have breast density notification laws. Effective January 2014, breast imaging facilities in North Carolina (NC) are legally required to notify women of their breast density and its potential impact. We examined whether the NC breast density notification law resulted in increased supplemental screening use or a change in the type of screening women received.

Methods. We studied Carolina Mammography Registry participants aged 40-79 years who received a 2D digital screening mammogram from January 2013-July 2016 with a negative or benign Breast Imaging Reporting and Data System (BIRADS) assessment. Breast density was dichotomized as dense (extremely dense or heterogeneously dense) and non-dense (scattered fibroglandular density or almost entirely fatty). We defined supplemental screening as receipt of digital breast tomosynthesis (DBT), ultrasound, or MRI performed within 3 months of the 2D digital screening mammogram with no symptoms of breast cancer. Screening mammograms from 2013 were classified as pre-law and those in 2014 or later as post-law. Using chi-square tests, we examined differences in the proportion of women with dense vs. non-dense breasts who received supplemental screening pre- and post-law. We also evaluated whether women with dense vs. non-dense breasts were more likely to use DBT for screening after passage of the density law.

Results. We included 96,739 screening mammograms performed at 12 community breast imaging facilities. A similar proportion of women had dense breasts in the pre- and post-law era (30% vs. 29%, respectively). The proportion of women who received supplemental screening pre- and post-law was <1% for both density groups and did not differ when the supplemental screening window was extended to 6 or 9 months. Similar proportions of women with dense and non-dense breasts switched to DBT for screening in the post-law era (12.6% vs. 12.5%, respectively).

Conclusions. Breast density notification in mammography result letters did not influence the receipt of supplemental screening in NC. Breast density also did not appear to play a role in changing screening behavior from 2D digital to DBT.

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Multi-level Patient Navigator Led Intervention to Optimize Colonoscopy Completion After an Abnormal Fecal Immunochemical Test

Hernandez M, Nodora J, Bharti B, Marquez J, Garcia-Bigley F, Ramers C, Haughton J, Arredondo E, Gupta S

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 2.5 fold increased risk of CRC death. Colonoscopy completion after abnormal FIT ranges from 43% to 50% among Federally Qualified Health Centers (FQHCs) in our geographic area. Our goal is to report the initial successes and challenges of a multi-level, patient navigator (PN) lead intervention to optimize colonoscopy completion after abnormal FIT.

Methods: At a single primary clinic within a large FQHC serving San Diego county, we implemented a multi- component intervention to promote colonoscopy completion for patients with abnormal FIT lead by a bilingual/bicultural PN. PN responsibilities included monitoring timely review of FIT results by ordering provider, results provision to patients, insurance authorization, referral for GI consultation, and colonoscopy scheduling. Health system barriers (such as failure to order colonoscopy) were addressed by having the PN remind the relevant team member to complete required care steps. Patient barriers (such as understanding FIT result and follow up, and fears) were addressed through phone and in-person encounters by the PN.

Results: 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 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 colonoscopy. Challenges such as loss to follow up remain a barrier to intervention success. Our results suggest that multi-level interventions lead by a PN have potential to optimize follow up after abnormal FIT.

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Simulation Modeling of Breast Cancer Clinical Trials: Long-term Harms and Benefits of Chemotherapy among Women with Low-risk Hormone-Sensitive Early-stage Breast Cancer

Jayasekera J, Schechter C, Sparano J, O'Neill S, Mandelblatt J

Purpose: Simulation modeling can play a key role in extending clinical trial data in low-risk adjuvant breast cancer settings. Oncotype DX® test is useful in the identification of women who have a low risk of recurrence and can safely avoid chemotherapy. However, there are persistent gaps in knowledge on the use of Oncotype testing in treatment decisions to minimize harms and maximize benefits of chemotherapy among women with favorable prognosis breast cancer. We simulated long-term chemotherapy effects on recurrence and mortality among early-stage breast cancer women with Oncotype scores 0-10, using an established Cancer Intervention and Surveillance Modeling Network (CISNET) breast cancer model.

Methods: A Monte Carlo microsimulation was conducted to project long-term (up to 15+ years) outcomes for any first event, recurrence, distant recurrence, and all-cause mortality among women diagnosed with HER2 negative, node-negative breast cancer tumors of 1.1-5.0 cm with Oncotype scores of 0-10. The input parameters were derived from the Oxford Overview and published NSABP trial data. We assessed model-fit by comparing Kaplan-Meier survival estimates for each trial endpoint up to 5-years with Trial Assigning Individualized Options for Treatment (TAILORx) published results.

Results: Women with favorable gene-expression profiles had high recurrence-free interval rates for any recurrence (92%) and distant recurrence (97%) at 15-years of follow-up with omission of adjuvant chemotherapy. However, rates of invasive disease-free survival (74%) and overall survival (88%) at 15-years were comparatively low. The results for the preliminary model showed excellent concordance with the initial published results from TAILORx for all trial outcomes in the first five years for patients with Oncotype scores 0-10.

Discussion: Although more recurrences are expected with longer follow-up, our model projections show that long-term recurrence rates remain low among women with Oncotype scores of 0-10. Modeling and simulation are useful in extending clinical trial data by synthesizing information from historical trials.

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Nurse Practitioners' Lung Cancer Screening Knowledge, Attitudes and Clinical Behaviors in the United States: A Mixed Methods Study

McDonnell KK, Estrada RD, Dievendorf AC, Blew L, Warden D, Hardin J, Sercy E, Eberth JM

Background: Despite declining incidence rates, lung cancer is still a leading cause of cancer mortality. About 75% of lung cancer patients are diagnosed in locally advanced or metastatic stages with low 5-year survival rates. Low-dose computed tomography (LDCT) may increase the earlier detection and survival rates. The growth in the number of advanced practice nurses (NPs) in primary care increases the likelihood that an NP will serve as a patient's primary care provider. This study examined knowledge, attitudes, and clinical behaviors regarding lung cancer screening among primary care NPs.

Methods: An explanatory, sequential, mixed-method design used a 32-item questionnaire to measure knowledge, attitudes, and behaviors with LDCT screening and shared decision-making followed by a semi-structured qualitative telephone interview. Survey and interview question development were guided by a conceptual framework representing a temporal sequence for behavior change and potential barriers to guideline adherence.

Results: 380 NPs responded. A majority were board certified (98%), specialized in family medicine (78%) and held a master's degree (87%). The majority had correct knowledge (68%) about which patients qualified for LDCTs. A substantial majority (79%) agreed that the benefits outweighed the risks. Qualitative interviews facilitated a deeper interpretation of the survey responses. Three themes emerged: Screening decision-making: Competing demands; Guideline adherence: Identifying and responding to patient challenges; and Optimizing evidence-based practice: Provider facilitators and barriers. Administrative support, an EMR that generated screening reminders and decision aids facilitated discussions with high-risk patients. Low demand, patient financial issues and practice patterns were major barriers.

Conclusions: NPs believe that shared decision making about lung cancer screening is within their scope of primary care practice, yet their influence is limited to improve screening uptake in time constrained primary care work settings. Disseminating clinical practice guidelines and authorizing health insurance reimbursement is not enough. A culture change is needed where cancer prevention and early detection have greater value for providers and patients.

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Healthy Colon, Healthy Life: Improving Wait Times for Colonoscopy after Colorectal Cancer Screening

Nanayakkara JA, Champion P, Lilek C, Luscombe B, Klisowsky D, Bewsher O, Duliban C, Peters R, Law M

Purpose This project aims to increase the proportion of timely colonoscopies after positive FOBT to 85% by April 2018. **Description** Fecal Occult Blood Tests (FOBTs) indicate blood in the stool, a potential sign of colorectal cancer. Colorectal cancer is the second leading cause of cancer deaths in Ontario, but is treatable if detected early. According to Cancer Care Ontario, a follow-up colonoscopy is required within 56 days to determine if polyps are truly present. At Niagara Health, positive FOBT colonoscopies are not always performed within the target wait time. Given that research outlines that timeliness of positive FOBT colonoscopies impacts the quality of patients' lives, a quality improvement initiative has been undertaken to determine appropriate changes.

Methods An interdisciplinary team focused on improving the central referral system, which books colonoscopies within 56 days based on specialist availability. Targeted data analysis revealed that increased family physician utilization of the central referral system should decrease wait times. An information package about the central referral system was developed and distributed through an awareness campaign for family physicians in the Niagara Region.

Results Data analysis revealed stagnant rates of meeting the target wait time over the past few years and highlighted large variations in wait times by physician group. Colonoscopies scheduled through the central booking system consistently met the 56 day wait time; however, the proportion of colonoscopies booked through the central system was low. Engagement with family physician offices, through personal interactions with office staff and targeted follow-up calls, appeared to increase awareness of the central referral system.

Conclusions This project demonstrates how quality problems, such as long wait times for positive FOBT colonoscopies, may already have a solution but require increased buy-in to the improved system and sustained program momentum. Personal visits to physician offices may build buy-in to the central referral system, reduce colonoscopy wait times and ultimately improve the colorectal health of Ontarians. This timeliness is particularly relevant given the upcoming shift to Fecal Immunochemical Test (FIT) screening.

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Family history and family structure in the Carolina Breast Cancer Study

Puvanesarajah, S; Tse, J; Troester, MA

The majority of studies that have examined the relationship between family history and breast cancer risk have done so using a yes/no family history variable, a classification method that does not take into account family structure. Using the Carolina Breast Cancer Study (CBCS) Phases 1&2, a large diverse population-based case control study, we examined the utility of a quantitative measure of family history, a family history rate score (FHRS), that accounts for age at diagnosis, number of affected female first degree relatives, and total number of female first degree relatives. Multivariate logistic regression models were used to calculate odds ratios and 95% confidence intervals, overall and stratified by age, race, and tumor characteristics. Among cases, FHRS was higher for White vs. African-American (2.89 vs. 1.91, $p=0.0005$) women and women < 50 years old vs. women ≥ 50 (2.95 vs. 2.00, $p=0.009$). This was in contrast to using a yes/no measure of family history, which did not show statistically significant differences by race or age. Observed differences in FHRS by age and race are in part due to familial time at risk, which made up the denominator of the score; both White and younger women had less familial time at risk. We also observed that compared to White women, African-American women were more likely to have "inadequate family history" (OR=2.39, 95% C.I.: 1.89-3.03), a measure which reflects lack of family history information for first degree relatives. Stratification on age, race, ER or triple negative status did not modify the risk associated with binary family history or FHRS. These data suggest that family history is an important risk factor for African-American and White women alike and is associated with different breast cancer subtypes, whether described as the presence vs. absence of family history or with a more nuanced measure. In addition, this study highlights how differences in family structure by age or race can affect measures of family history.

86-T

Lay Beliefs about the Accuracy and Value of Cancer Screening: Findings from the National Cancer Institute's Health Information National Trends Survey

Roberts, MC; Ferrer, RA; Rendle, KA; Kobrin, SC; Taplin, SH; Hesse, BW; Klein, WM

INTRODUCTION: Many guidelines recommend that patients play active roles in cancer screening decision-making with their providers through shared decision-making (SDM) to maximize patient-centered care. To engage in the SDM process patients must understand basic characteristics of cancer screening tests. This study's objectives were (1) to examine peoples' beliefs about the characteristics of cancer screening tests, and (2) to determine whether individual characteristics, cancer beliefs and cues to action are associated with these beliefs.

METHODS: We used data from the National Cancer Institute's Health Information National Trends Survey (HINTS 4, cycle 4, August- November 2014). Respondents were non-institutionalized adults (18+ years; $n=3,677$). Using weighted generalized linear modeling (StataCorp 14), we examined responses to four true/false questions (e.g., When a test finds something abnormal, it is very likely to cancer; The harms of these tests and exams sometimes outweigh the benefits) about the accuracy and the balance of benefits and harms of cancer screening tests to examine bivariate and multivariate associations between key covariates and their responses. As a secondary analysis, we examined whether these beliefs were associated with self-reported cancer screening (mammography, pap testing).

RESULTS: Overall, knowledge about cancer screening tests was low: Only 5.6% ($n=189$) of respondents correctly answered all four cancer screening items. Males, racial/ethnic minorities, those with lower education and cancer fatalism were less likely to have accurate beliefs about cancer screening. Those who reported SDM for colorectal cancer screening were more likely to know that "when a test finds something abnormal, more tests are needed to know if it is cancer" and "when a test finds something abnormal, it is [not] very likely to be cancer" ($aRR=1.13$, $p<0.01$, $aRR=1.25$, $p<0.01$). Beliefs were not associated with likelihood of past mammography or pap testing.

CONCLUSIONS: Knowledge about cancer screening was low, especially among men and underserved populations. Educators, researchers and clinicians should consider opportunities (e.g., patient centered communication, decision support tools) to improve the accuracy of individuals' beliefs about cancer screening.

Poster Session Abstracts

87-T

Beyond tamoxifen use for breast cancer treatment: factors unique to secondary endometrial cancer diagnosis

San Miguel Y, Davis J, Yates M, Zhao H, Giordano S, Chang S

Purpose: Tamoxifen treatment for breast cancer is known to increase risk of endometrial cancer; however, few studies have identified other factors associated with endometrial cancer following breast cancer treatment with tamoxifen. The objective of the study is to compare the sociodemographic and clinical factors of patients diagnosed with endometrial cancer after breast cancer with those of patients with primary endometrial cancer and with primary breast cancer only.

Methods: We conducted a case-comparison study using the population-based Surveillance, Epidemiology, and End Results (SEER) dataset. Among women, ages 20-89, between the years 1978 and 2013, we defined cases as patients diagnosed with endometrial cancer at least 6 months after a breast cancer diagnosis. We created two comparison groups: 1) women diagnosed with primary breast cancer or primary endometrial cancer and did not have a secondary cancer diagnosis during the defined period, and 2) women diagnosed with cancer at a site other than the breast or reproductive tract. Race/ethnicity, stage at diagnosis, menopausal status (pre < 50 years at diagnosis; post ≥ 50 years), and tumor grade were used as covariates.

Results: Women with secondary endometrial were more likely to be older at breast cancer diagnosis compared to women with breast cancer only (OR: 1.04), 95% CI: 1.024- 1.05), and were also more likely to have higher grade, earlier stage breast cancer compared to women diagnosed with breast cancer only. Compared to women diagnosed with primary endometrial cancer only, women with secondary endometrial cancer were older at endometrial cancer diagnosis (OR: 1.202; 95% CI: 1.18- 1.23), and had higher endometrial tumor grade.

Conclusion: Identifying the differences between these cancer patient groups may reveal insights for identifying risk factors for endometrial cancer among women being treated for breast cancer. Ultimately, recognizing such risk factors can help guide breast cancer treatment decisions and avoid subsequent endometrial cancer.

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Cervical Cancer Screening Needs and Preferences among Sexual Minority Women

Seay JS, Margolies L, Kobetz E

Background: Sexual minority women are less likely to obtain up-to-date cervical cancer screening compared with their heterosexual counterparts. We are currently conducting a nationwide survey to better understand the cancer screening needs and preferences of lesbian, bisexual, and queer (LBQ) women.

Methods: Currently, 69 sexual minority women ages 23 to 70 have completed the survey. The survey was administered online via REDCap, in partnership with the National LGBT Cancer Network. Descriptive statistics were calculated to assess sociodemographic characteristics, screening history, and screening preferences. We also conducted logistic regression analyses to evaluate potential associations between sociodemographic characteristics, screening history, and screening preferences.

Results: The sample was 75% non-Hispanic White, 4% Hispanic, 4% non-Hispanic Black, 3% mixed race, and 3% other races. Almost all participants (93%) reported having some form of health insurance, and the majority of participants reported having up-to-date cervical cancer screening (77%). Nearly a third (29%) of participants reported avoiding preventive care due to discrimination. The majority of participants (67%) reported they would be willing to complete HPV self-sampling, an alternate form of cervical cancer screening that can be done in private using a device that is similar to a tampon. When asked about screening preferences, 33% of participants preferred Pap smear screening, 30% of participants preferred HPV self-sampling, and 26% of participants reported they would prefer either form of screening. Participants who reported greater avoidance of preventive care due to discrimination were more likely to prefer HPV self-sampling (OR = 1.89, 95% CI: 1.08-3.29, p = 0.026).

Conclusion: Cervical cancer screening remains a significant issue for sexual minority women. Women who are not up-to-date for cervical cancer screening and/or who have experienced discrimination when previously seeking preventive care may benefit from the option of HPV self-sampling. The feasibility, acceptability, and efficacy of this alternative screening method warrants further exploration among sexual minority women.

Poster Session Abstracts

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Guideline concordance of BRCA1/2 testing in The Health of Women Study

Roberts M, Klein W, Samimi G, Minasian L, Loud J, Silver MI

Purpose: To evaluate factors associated with compliance to National Comprehensive Cancer Network (NCCN) guidelines for BRCA1/2 testing and identify patient groups who are at higher risk of under- and over-use of BRCA1/2 testing.

Methods: This analysis leverages a large dataset of individuals with and without breast cancer from Dr. Susan Love Research Foundation's The Health of Women Study™. We included data from women (18+ years) who completed the basic health overview and the personal and family health history surveys (n=22,410). Multinomial logistic regression was used to examine the association of clinical, socioeconomic, and demographic characteristics with whether the woman was over-, under-, or appropriately tested for BRCA1/2 mutations, per NCCN guidelines.

Results: 4,326 women (19.5%) reported being tested for BRCA1/2. Of those, 3,112 (71.9%) were categorized as appropriately tested and 1,214 (28.1%) were categorized as over-tested based on the 2016 NCCN guidelines. 15,466 (69.8%) women were appropriately not tested for BRCA1/2, and 2,383 (10.8%) women who met NCCN criteria for testing were not tested. Those who were guideline-discordant were twice as likely to be under-tested than over-tested. Those with Medicaid were more likely to be under-tested (OR: 2.02, 95% CI: 1.47-2.78) than those with a managed care insurance plan, and higher education was associated with a lower likelihood of under-testing (4-year college degree OR: 0.73, 95% CI: 0.60-0.89; Graduate/professional degree OR: 0.65, 95% CI: 0.54-0.79).

Conclusion: Appropriate testing is necessary for accurate risk assessment, which is critical for guiding screening, prevention, and treatment decisions. Among this highly motivated population of women, approximately 80% were guideline-concordant with BRCA1/2 testing, but twice as many women were under-tested than over-tested, indicating that many high-risk women who may benefit from genetic testing are currently being missed. Without appropriate testing, providers are unable to tailor screening recommendations to those women carrying mutations who are at highest risk. Patient and healthcare provider education and outreach targeted to low income and under-served populations may assist in reducing under-testing.

90-T

Disparities in colorectal cancer screening: Intersectionality of gender, race, and sexual orientation

Sutter ME, Meade CD, & Gwede CK

Intersectionality theory posits that aspects of identity such as race/ethnicity, gender, and sexual orientation influence healthcare utilization through a multitude of sociocultural and behavioral mechanisms (e.g., access to care, employment, healthcare providers, discrimination). The intersectional framework may shed light on known racial/ethnic disparities for colorectal cancer (CRC) screening by examining the interactions between race/ethnicity, gender, and sexual orientation. This study utilized publicly available, de-identified data from the 2014-2016 Behavioral Risk Factor Surveillance Survey to examine the interaction of race/ethnicity (race), sexual orientation (SO), and gender among lifetime CRC screening (stool blood test [FOBT] and endoscopy), as well as being up-to-date (UTD). The analytic sample (n=118,473; 60% female, 82% white, 98% heterosexual) included individuals ages 50+ years. Unweighted logistic regressions were stratified by gender with race (0=white; 1=people of color [POC]), SO (0=heterosexual; 1=sexual minority), and race×SO as predictors of CRC screening (0=no; 1=yes). **MALES:** Significant findings were identified for FOBT [race×SO: OR=.70, p=.045], endoscopy [race: OR=.70, p<.001; SO: OR=1.19, p=.025], and being UTD [race: OR=.76, p<.001; SO: OR=1.21, p=.020]. Sexual minority POC had the lowest lifetime use of FOBT (27%), followed by heterosexual POC (33%), white heterosexuals (34%), and white sexual minorities (35%). Heterosexual POC had the lowest lifetime use of endoscopy and U2D screenings, respectively, (65% and 68%) followed by sexual minority POC (71% and 72%), white heterosexuals (73% and 73%), and white sexual minorities (76% and 77%). **FEMALES:** Significant findings were identified for endoscopy [race: OR=.84, p<.001; and race×SO: OR=.56, p=.001] and being U2D [race: OR=.94, p=.006; and race×SO: OR=.55, p=.001]. Sexual minority POC had the lowest lifetime use of endoscopy and U2D screenings, respectively, (60% and 63%) compared to heterosexual POC (70% and 73%), white heterosexuals (73% and 74%), and white sexual minorities (76% and 77%). Findings highlight the importance of intersectionality in identifying risk of underutilization of CRC screening. Tailored education interventions may benefit at-risk subgroups.

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Understanding Women's Perspectives and Information Needs Following a Positive HPV Self-Sampling Test Result

Tiro JA, Buist D, Kimbel K, Shulman L, Betts A, Migliorretti D, Mao C, Thayer C, Malone C, Gao H, Beatty T, Lin J, Winer R.

Background At-home HPV self-screening kits with triage of high-risk HPV+ women to in-clinic follow-up may improve cervical cancer screening adherence. Understanding patient experience after a positive kit result is essential to optimize delivery and minimize negative perceptions of self-screening. We explored patient perspectives after a HPV+ self-screening result to identify information needs and emotional responses to this new screening modality.

Methods We conducted a pragmatic randomized controlled trial in Kaiser Permanente Washington (an integrated healthcare system) to compare two programmatic approaches for increasing screening among women aged 30-64 years who were overdue (≥ 3.4 years since last Pap; see abstract #218 for details). Control arm included usual care (annual reminders and adhoc clinic outreach). Intervention arm included usual care plus an unsolicited mailed HPV self-sampling kit. We recruited 46 kit returners who tested HPV+ (62% of invited; median age 55.5 years) to complete a semi-structured interview and a brief survey. Most women completed timely diagnostic evaluation (85% had a Pap and/or colposcopy, mean=15 [IQR=10-35] days between HPV+ result and first in clinic procedure). Four coders analyzed transcripts using iterative content analysis.

Results Seven themes emerged: 1) convenience of home test; 2) surprised by kit results because low perceived risk of HPV infection; 3) anxiety and urgency to follow up and discuss results with provider; 4) poor understanding of kit results and subsequent information-seeking through Internet, patient portal, and family/friends; 5) provider communications about results eased patient worry; 6) confusion about purpose and meaning of HPV versus Pap results; and 7) concern that HPV self-screening was inaccurate when follow-up Pap was normal. Most women strongly agreed their experience using the kit was positive; but only 65% agreed they trusted the HPV result and 59% believed it was correct.

Conclusion Although women liked the test's convenience, communication about discordant home HPV and in-clinic Pap results led some to question accuracy of self-screening. Patient-provider communication around self-screening is more complex than for reflex or co-testing, because clinician-collected Pap results are

92-T

Hazardous Metallic Air Toxics and Breast Cancer Risk in a Nationwide Cohort Study

White, AJ; O'Brien KM; Niehoff NM; Sandler DP

Purpose. Heavy metals have carcinogenic and estrogenic properties, however, little is known about the relationship between airborne metals and breast cancer. We evaluated the risk of breast cancer in relation to metallic air toxics individually and simultaneously in a U.S wide cohort.

Methods. Sister Study participants (n=50,884), breast cancer-free women with a sister with breast cancer, were recruited from 2003-2009. The 2005 Environmental Protection Agency National Air Toxic Assessment's census-track concentration estimates of heavy metals (antimony, arsenic, cadmium, chromium, cobalt, lead, manganese, mercury, nickel, and selenium) were matched to participants' enrollment residence. We used Cox regression to estimate adjusted hazard ratios (HRs) and 95% confidence intervals (95% CI) for the association between quintiles of individual metals and breast cancer and used weighted quantile sum (WQS) regression to model the association between the metal mixture and breast cancer.

Results. 2,756 breast cancer cases were diagnosed during follow-up (mean=7.4 years). In individual chemical analyses comparing the highest to lowest quintiles, postmenopausal breast cancer risk was elevated for mercury (HR=1.25, 95%CI: 1.08-1.46), cadmium (HR=1.11, 95%CI: 0.96-1.28), and lead (HR=1.14, 95%CI: 0.98-1.32). The WQS index was significantly associated with postmenopausal breast cancer (odds ratio (OR)=1.07, 95%CI: 1.01-1.13). Consistent with the individual analysis, the most highly weighted chemicals for predicting postmenopausal breast cancer risk were lead, cadmium and mercury. Results were attenuated for overall breast cancer.

Conclusions. Higher levels of some airborne metals, specifically mercury, cadmium and lead, were associated with a higher risk of postmenopausal breast cancer.

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Factors associated with the development of early onset oral tongue cancer

Campbell BR, Sanders CB, Netterville JL, Sinard RJ, Rohde SL, Langerman AJ, Murphy BA, Lewis JS, Warner JL, Smith DK, Lang Kuhs KA

While many types of head and neck cancer are declining in the US due to decreased tobacco use, incidence of oral tongue carcinoma (OTC) is rising among those under age 50. The underlying cause is unknown. The purpose of this study was to identify factors associated with early (< age 50) vs. traditional onset OTC and to evaluate patient outcomes. 567 OTCs diagnosed and/or treated at Vanderbilt between 2000 and 2016 were identified using the Research Derivative, a searchable database containing clinical data from more than 3.5 million electronic health records (EHRs) and cancer registry data (ex: cancer site, stage, date/age of diagnosis, race, gender). All confirmed incident cases without a prior history of cancer (N=417) underwent manual EHR review to obtain data not amenable for automated extraction: alcohol and tobacco use (cigarette, cigar, pipe, snuff, chewing tobacco), treatment, and outcome (recurrence/survival). Of the 417 patients, median age was 59 (interquartile range: 48-67), the majority were male (59.5%), white (95.4%), tobacco (64.8%) and alcohol users (61.2%), stage 0-II (52.5%), and treated with surgical resection only (59.5%). 118 (28.3%) cases were early onset. Compared to traditional onset cases, patients with early onset OTC were less likely to be heavy alcohol users (adjusted odds ratio [aOR]:0.2, 95% confidence interval [CI]:0.1-0.8) and more likely to receive combined modality treatment (surgery & radiation; aOR:2.8, 95%CI:1.1-7.0), and to report snuff use (aOR:4.8, 95%CI:1.6-14.7). Early onset patients had significantly better overall survival (adjusted hazard ratio [aHR]: 0.5, 95%CI:0.3-0.9). In stratified analyses, the association between early onset and improved survival was strongest among tobacco users (aHR:0.3, 95%CI:0.1-0.8); reduced risk of recurrence was only observed among early onset patients with no history of tobacco use (aHR:0.4, 95% CI:0.1-0.9). This is the largest study to evaluate factors associated with early onset OTC and the first to report an association with snuff – a smokeless tobacco increasing in popularity among younger birth cohorts. Yet, only 55% of early onset cases reported tobacco use and only 12% reported snuff use, suggesting the presence of additional, unknown factors contributing to the rise in OTC.

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Virtual Pooled Registry Cancer Linkage System for Cohort Matching and Duplicate Identification

Deapen D, Penberthy L, Kohler B, Clerkin C

Purpose: The North American Association of Central Cancer Registries (NAACCR) and the National Cancer Institute (NCI) are developing a Virtual Pooled Registry-Cancer Linkage System (VPR-CLS) that allows researchers to submit cohort data for matching with multiple cancer registries through a single, web-based system.

Background: Matching cohorts with multiple cancer registries is useful for confirming cancer diagnoses and obtaining additional information including outcomes. However, this process is difficult, labor-intensive and costly if separate permission to match is needed for each registry. The use and interpretation of different matching protocols in each setting may affect study validity. registries and two large cohorts of 1.) Environmentally exposed military personnel; and 2.) Radiation technologists with occupational exposures dating to the 1950s. Confidentiality of the data was maintained by conducting the match behind each Registry's firewall. We have developed sophisticated matching software for these linkages thereby ensuring that standardized criteria are used across sites. The VPR-CLS has also facilitated inter-registry linkages to identify duplicate cases and multiple primaries shared across geographic jurisdictions.

Results: Pilot linkages between two large research cohorts and over 40 registries were conducted. Nearly all registries performed the linkage and provided match counts for the researcher within 2-3 weeks of receiving the standardized, edited cohort file. Both pilot linkages identified CEC matches in all participating registries. In one cohort, historical linkage with four registries identified 26% under-ascertainment using self-report alone. Linkage with registries also provided these researchers with additional, curated data items of interest. The estimated cost was \$58,000 as compared with \$1.28M for the previous data collection method.

Discussion: The VPR-CLS was developed as a collaboration among the US registry programs (SEER and National Program of Cancer Registries), NCI, NAACCR and their statistical partner IMS, Inc. The VPR-CLS benefits cancer registries and researchers by providing a single, efficient system to facilitate multi-registry linkages, providing much faster results at significantly lower cost.

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95-T

Identifying women at high-risk for breast cancer using data from the electronic health record compared to self-report

Xinyi, J; Xinyi, L; McGuinness, JE., Vanegas, A; Colbeth, H; Vargas, J; Sandoval, R; Kukafka, R; Crew, KD

Purpose: A barrier to chemoprevention uptake among high-risk women is the lack of routine breast cancer risk assessment in the primary care setting. We calculated breast cancer risk using the Breast Cancer Surveillance Consortium (BCSC) model, accounting for age, race/ethnicity, first-degree family history of breast cancer, benign breast disease, and mammographic density using data collected from the electronic health record (EHR) and self-report.

Patients and Methods: Among women undergoing screening mammography, we enrolled women, age 35-74, without a prior history of breast cancer, mastectomy, or breast augmentation. We extracted data on demographics, structured first-degree family history, breast radiology and pathology reports from the EHR. We assessed agreement in breast cancer risk information between the EHR and a self-administered questionnaire.

Results: Among 13,764 women, 2719 women (19.7%) met high-risk criteria, based upon a 5-year invasive breast cancer risk $\geq 1.67\%$ according to the BCSC model. From the EHR, data was missing on 31% for race/ethnicity and 85% for family history. Among 2303 women with both EHR and self-report data, more first-degree family history (14% vs. 3%) and prior breast biopsies (18% vs. 11%) were identified by self-report vs. EHR, respectively. However, more women with atypia and lobular carcinoma in situ were identified from the EHR. More high-risk women (20% vs. 16%) were identified with EHR vs. survey data, respectively, with a moderate agreement (kappa of 0.41).

Conclusion: Among women undergoing screening mammography, we identified 20% who met high-risk criteria according to the BCSC model based upon EHR data with a moderate agreement to self-report data, despite missing data on race/ethnicity and family history. This may serve as an initial screen for identifying women eligible for breast cancer chemoprevention.

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An electronic medical record alert intervention to improve HPV vaccination among eligible male college students at a university student health center

Martin S, Warner E, Kirchhoff AC, Mooney R, Martel L, Kepka D

Purpose: Most recent data show that only 31.5% of males ages 13-17 years have completed three doses of the HPV vaccine. Young adults ages 19-26 have even lower documented HPV vaccine completion at only 10.1% among college-aged males. In 2016, Utah was the second lowest state in the nation for percent of boys who are up-to-date with HPV vaccination. This two-part pilot study aims to improve HPV vaccination for college aged males at a student health center in Utah.

Methods: The first part of the study consisted of a focus group that assessed the barriers and facilitators of HPV vaccination among healthcare providers and clinic staff (N=16). Providers and clinic staff also discussed missed opportunities for HPV vaccination. For the second part of the study, providers and clinic staff reviewed medical records of patients ages 18-26 with student health insurance and with <3 doses of the HPV vaccine at baseline (12/1/2014-7/31/2015) and follow-up (12/1/2015-7/31/2016). A computer-automated electronic medical record (EMR) alert was generated in the medical record for eligible male patients only (N=386). Z-scores were estimated for two-sample proportions to measure the change in HPV vaccination rates at baseline and follow-up for males and females.

Results: In the first part of the study, some focus group participants reported success when recommending HPV vaccines while most acknowledged challenges such as high costs for uninsured patients, patient beliefs that they do not need the vaccine because they plan to stay abstinent until marriage, and a common misconception that only females can receive the HPV vaccine. After the implementation of the pilot EMR reminder tool, HPV vaccine initiation rates increased among males (baseline: 5.2% follow-up: 25.1%, $p < 0.001$). In comparison, the follow-up HPV vaccination initiation rate among eligible females (n=353) was 8.8%, compared to the female baseline rate of 8.0% (difference=-0.01, 95%CI -0.05-0.03, $z = -0.36$, $p = 0.72$).

Conclusion: College-age males who have not received the HPV vaccine should not miss the opportunity to protect themselves from HPV and HPV-related cancers while still age eligible for the HPV vaccine. This study shows that EMR alerts improved HPV vaccine initiation rates among insured college-aged males.

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Isolation of cottonseed extract that affects human cancer cell growth

Cao, H; Sethumadhavan, K

Cottonseeds are classified as either glanded or glandless seeds depending on the presence or absence of yellow pigment glands which contain toxic gossypol, the best studied bioactive component in cottonseeds. Glanded cottonseeds rich in gossypol may have anticancer property and glandless cottonseeds essentially free of gossypol may cause cancer in animal studies. Therefore, it is important to investigate the effect of bioactive components from cottonseeds on cancer cells. The objective of this study was to isolate ethanol extracts from glanded and glandless cottonseeds and investigate their effects on human cancer cells. Glanded and glandless cottonseeds were fractionated into seed coat and kernel fractions followed by removal of oils with chloroform and hexane extractions. Ethanol extracts were isolated from the defatted seed coat and kernel and used to treat cultured human cancer cells derived from breast (MCF7), colon (COLO205), lung (A549) and pancreas (MIA PaCA-2). Cell viability was determined by MTT assay. The yield of ethanol extract was approximately 4% from glanded cottonseed and 2% from glandless cottonseed. Breast cancer cell viability was increased 20-60% after 2-h treatment but decreased 15-25% after 24-h treatment by ethanol extracts from glanded cottonseed extracts. Breast cancer cell viability was decreased 40% after 2-h treatment by glandless seed kernel extract only. Colon cancer cell viability was decreased 10-20% by 2-h treatment but increased 10-30% by 24-h treatment of ethanol extracts. Lung cancer cell viability was decreased 20-40% by kernel extract but not by coat extract. Pancreatic cancer cell viability was mostly increased up to 50% by coat extract but decreased up to 50% by kernel extract. These results suggest that ethanol extracts from cottonseeds contain pro- and anticancer activities. It is important to identify the bioactive components in cottonseed extracts in future studies.

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Nonsteroidal Anti-Inflammatory Drug (NSAID) Use, Obesity, and Survival from Colorectal Cancer

Chavez JC, Davis JS, San Miguel Y, Overman MJ, Jiang Z, Manuel SD, Kopetz S, Chang S

Regular use of nonsteroidal anti-inflammatory drugs (NSAIDs) has been associated with decreased risk of developing colorectal cancer (CRC), and emerging evidence suggests improved overall survival for subsets of patients who regularly use NSAIDs following diagnosis. Conversely, obesity is a known CRC risk factor, yet its impact on survival is unclear. The effect of regular NSAID use on CRC survival in the context of obesity largely unknown. The purpose of this study is to analyze the influence of pre-diagnostic obesity with and without post-diagnostic NSAID use on overall survival in CRC patients. Patients participating in the Assessment of Targeted Therapies Against Colorectal Cancer (ATTACC) protocol at MD Anderson were invited to complete an environmental survey that includes data on NSAID use and self-reported weight history. These data were combined with information from the medical record to describe recent and ongoing NSAID use. Patients were followed-up for disease and survival outcomes through contact with study personnel and periodic letters from the institution. Survival was compared by obese vs non-obese and NSAID users vs nonusers. Results were adjusting for or stratified by gender, race/ethnicity, and stage at diagnosis using Cox Proportional Hazards models and adjusted survival curves were generated using the 'DIRECTADJ' option. Obesity (BMI ≥ 30 kg/m²) was associated with worse overall survival than normal weight individuals, HR = 1.45 (95 % CI 1.10 – 1.90 P = 0.02). NSAID use was significantly linked to improved overall survival, HR = 0.81 (95 % CI 0.67 – 0.98; P = 0.03). However, when stratified by BMI, the protective effects of NSAIDs were only evident in the patients of BMI ≤ 25 kg/m², HR = 0.75 (95 % CI 0.60 – 0.94; P = 0.04). Among colorectal cancer patients, obesity bodes a worse prognosis while NSAID use significantly improves overall survival, but only in patients of BMI ≤ 25 kg/m². These results may help further understand how modifiable CRC risk factors could also impact survivorship. Furthermore, identifying subsets of patients most likely to benefit from post-diagnostic NSAID use is an important step toward minimizing toxicities through individualized recommendations, potentially improving treatment and survivorship of CRC overall.

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The novel combination of sulforaphane and maitake mushroom extract suppresses the expression of matrix metalloproteinases in THP-1 human monocyte/macrophage cells

Erwin, S; Cornblatt, G

Purpose: Matrix metalloproteinases (MMPs) are proteolytic enzymes that have been associated with the progression of cancer. MMPs are most notable for their role in the degradation of the extracellular matrix allowing for migration, invasion and metastasis but also play a role in the immune system by potentiating cytokine and chemokine activity. Here, we examine the effect of a novel combination of sulforaphane and maitake mushroom extract on the gene expression of several MMPs including MMP-1, -2, -3, -9 and -13. Sulforaphane is a phytochemical produced by the hydrolysis of its precursor glucoraphanin by myrosinase enzyme, both of which are found in cruciferous vegetables like broccoli. Sulforaphane has been shown to positively modulate the Keap1/Nrf2 detoxification and antioxidative system, the heat shock response, and the NF- κ B inflammatory pathway. Maitake mushrooms have been used for centuries for their immunomodulatory properties attributed to their beta-glucan content.

Methods and Results: THP-1 human monocyte/macrophage cells were treated with LPS (1 ng/mL) with or without the combination of maitake mushroom extract (250 μ g/mL) and a physiological level of sulforaphane (0.5 μ M) in order to examine its effect on MMP-1, -2, -3, -9 and -13 gene expression via quantitative RT-PCR. The combination was able to significantly suppress the gene expression of MMP-1, -3, -9 and -13, while a trend was observed in suppressing MMP-2.

Conclusion: This study demonstrates the effect the combination of sulforaphane and maitake mushroom extract has on reducing the expression of several MMPs involved in the progression of cancer. Previously, we showed the combination of sulforaphane and maitake mushroom extract possesses cytoprotective properties as it induces the expression of detoxification and anti-oxidant genes via the Keap1/Nrf2 pathway as well as diminishes expression of pro-inflammatory mediators. This data further demonstrates that the combination of sulforaphane and maitake mushroom extract may offer additional protective properties by regulating the gene expression of MMPs implicated in cancer progression.

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Abstract Withdrawn.

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Differences in leukocyte telomere length, measured using dried blood spot specimens, and survival after colorectal cancer diagnosis

Hardikar S, Thomas S, Phipps AI, Newcomb PA

Short telomeres have been associated with increased risk of cancers, including colorectal cancer (CRC). However, their role in survival after CRC diagnosis is not clear. We evaluated the association between circulating leukocyte telomere length (LTL) and survival, both overall and CRC-specific, within a subset (n=432) of the Seattle Colon Cancer Family Registry (SCCFR), a prospective cohort of persons diagnosed with CRC between 1997 and 2002. All cases completed a risk-factor questionnaire, including information on demographic and lifestyle factors, and provided blood samples that were stored as dried blood spots. Vital status and cause of death was determined through linkage to a regional cancer registry and National Death Index. Tumor markers (BRAF and KRAS- mutation status) were evaluated on a subset (78%). Telomere length (T) relative to a single copy gene (S) was measured in DNA extracted from circulating leukocytes in stored dried blood spots using quantitative polymerase chain reaction. Hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox proportional hazards regression after adjusting for age at diagnosis, sex, BMI, smoking, and NSAID use. After a median of 4.88 years of follow-up since diagnosis, 277 deaths were observed, 200 from CRC. LTL in the shortest tertile (standardized T/S ratio <0.18) was associated with poorer overall survival, however, it did not reach statistical significance [HR(95%CI) = 1.12(0.86-1.47)]. There was a suggestion towards difference in association for overall survival by KRAS-mutation status such that poorer survival was observed among KRAS-mutant tumors but not among KRAS wild-type tumors [HR(95%CI) = 1.42(0.80-2.50) and 1.00(0.63-1.58), respectively], but this was not statistically significant (p-interaction=0.22). Results for CRC-specific survival were similar. Our results suggest that persons with short LTL, measured using dried blood spots, may experience poorer survival (both overall and CRC-specific) after CRC diagnosis. This was particularly notable for KRAS-mutated tumors, although the association was not statistically significant and sample size was limited. Future larger studies are necessary to further establish the potential relationship between LTL and survival after diagnosis of CRC.

102-T

Clinical Prostatitis and Prostate Cancer: A meta-analysis evaluating the influence of detection bias

Langston ME, Horn MC, Khan S, Pakpahan R, Dennis LK, Sutcliffe SS

Purpose: Previous meta-analyses have estimated a positive association between a history of clinical prostatitis and prostate cancer. However, these meta-analyses included a mixture of studies that did and did not take into account detection bias, i.e., the possibility for increased prostate cancer screening and detection in men with clinical prostatitis. Therefore, we performed an updated meta-analysis to summarize the evidence of this association, accounting for detection bias.

Methods: Ovid Medline, Embase, Scopus, Cochrane Central Register of Controlled Trials, Database of Abstracts of Reviews of Effects, Cochrane Database of Systematic Reviews, Clinicaltrials.gov, and WHO International Clinical Trials Registry Platform were searched for studies that investigated the possible relation between clinical prostatitis and prostate cancer through October 2017. Summary odds ratios (ORs) were calculated using random-effects meta-analysis.

Results: 39 studies were eligible for analysis, including 34 case-control studies, 3 cohort studies, and 2 cross-sectional studies. An increased odds of prostate cancer was seen among men with a history of clinical prostatitis (OR=1.89, 95% CI 1.55-2.29) for all studies combined, although this estimate decreased slightly among studies (n=15) that performed any analysis to limit the influence of detection bias (OR=1.67, 95% CI 1.23-2.27), and decreased to a null value among studies (n=5) that performed the most rigorous analyses to limit detection bias (i.e., those that excluded men with prostatitis diagnoses close in time (~12 months) to their cancer diagnosis (OR=1.09, 95% CI 0.85-1.39)).

Conclusion: Previously reported positive associations between clinical prostatitis and prostate cancer were likely mostly due to detection bias. A diagnosis of clinical prostatitis may comprise several conditions with a large proportion not involving inflammation (ie., chronic pelvic pain syndrome), efforts in this area focused on symptomatic and asymptomatic inflammation might be more useful in determining association with prostate cancer.

Poster Session Abstracts

103-T

Marginal Structural Model to Determine the Causal Effect of Aspirin on Reducing the Risk of Prostate Cancer

Omofuma OO, Steck SE, Merchant AT

Purpose: In the United States, prostate cancer is the most commonly diagnosed malignancy among men, accounting for about 1 in 5 new cancer diagnoses. Chronic inflammation plays a major role in carcinogenesis and it is hypothesized that aspirin, a nonsteroidal anti-inflammatory drug could play a preventive role in prostate carcinogenesis through its inhibitory effect on the COX enzyme. Previously, baseline aspirin use at least once per day was associated with a modest reduced risk of prostate cancer in the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial. We updated the analyses to include information on aspirin use at follow-up and to adjust for time-varying covariates.

Method: Incident cases of prostate cancer were obtained from the screened arm of the PLCO. Enrollment was from 1993 until 2001 and subjects were followed up until 2009. Aspirin use during the previous 12 months was ascertained through self-report at baseline and in 2006, 13 years into the trial, to capture updated information. Subjects with missing baseline information on aspirin use (n=973), race (n=22), education (n=45), marital status (n=14), and no follow up time (n=164) were excluded from the analysis. The final sample included 36303 men aged 49 to 77 years [mean (SD) = 62.70 (5.32)] at baseline. A marginal structural model (MSM) was used to estimate the causal effect of aspirin use on the risk of prostate cancer by creating stabilized inverse-probability-weights to adjust for time dependent covariates; smoking, diabetes, arthritis, heart disease, hypertension, and stroke. Other covariates included in the model were age, race, education, marital status, family history of prostate cancer, BMI, and study site. Censored weights also were created to adjust for bias from loss to follow-up.

Results: A total of 4246 incident cases of prostate cancer were reported. MSM analysis for the causal effect of aspirin use at baseline on prostate cancer incidence produced an OR of 0.98 (95% CI: 0.91 – 1.06) and the total effect of aspirin use over the study period produced an OR of 1.00 (95% CI: 0.91 – 1.10).

Conclusion: These results suggest that the cumulative use of aspirin over the follow-up period does not have a significant causal effect on the risk of prostate cancer.

104-T

The role of adiposity, inflammation and insulin response biomarkers in mediating the association between empirical (hypothesis-oriented) dietary patterns and colorectal cancer risk

Tabung, FK; Tchetgen, ET; Liu, L; Fung, TT, Smith-Warner, SA; Giovannucci, EL

Background: Adiposity, circulating inflammatory and insulin response biomarkers have been associated with colorectal cancer risk. Dietary patterns including the empirical dietary inflammatory pattern (EDIP) score, developed based on some of these biomarkers, and the Western dietary pattern have been associated with colorectal cancer risk. However, the biological mechanisms underlying these associations have not been formally quantified. We evaluated the extent to which these associations are mediated by body mass index (BMI), circulating inflammatory [C-reactive protein (CRP), interleukin-6 (IL6), TNF-alpha receptor 2, adiponectin, macrophage inhibitory cytokine-1, MIC1)] and insulin response (C-peptide) biomarkers.

Methods: We used dietary and biomarker data from 1730 men and women in case-control studies nested within the Nurses' Health Study and Health Professionals Follow-up Study. We fitted logistic regression models in causal mediation analyses using inverse odds weights, to calculate odds ratios for direct and indirect dietary patterns' effects on colorectal cancer risk, comparing extreme dietary patterns tertiles (n=1153). We also estimated the proportion of association mediated.

Results: Total effects [OR (95%CI)] for participants in the highest tertile were: 1.25 (0.95, 1.63) for EDIP score and 1.30 (0.99, 1.70) for Western pattern score. The proportion (%) of the association mediated was: BMI, 10.5; C-peptide, 15.3; CRP, 15.3; IL6, 17.2; TNFR2, 21.2; MIC1, 14.5, for the EDIP score; and BMI, 6.6; C-peptide 4.4; CRP, 13.5; IL6, 15.8; TNFR2, 9.6; MIC1, 8.4 for the Western pattern score.

Conclusion: Our results suggest that, in intervention studies, adiposity, circulating inflammatory and insulin response biomarkers may be monitored as intermediates partially linking dietary intake to colorectal cancer development.

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105-T

Inflammatory potential of diet, inflammation-related lifestyle factors and risk of pancreatic cancer: results from the NIH-AARP Diet and Health Study

Zheng J, Wirth MD, Merchant AT, Zhang J, Shivappa N, Stolzenberg-Solomon RZ, Hebert JR, Steck SE

Background: Inflammation-related lifestyle factors such as smoking and obesity may act synergistically with inflammatory potential of diet, to affect pancreatic cancer risk. We used data from the NIH-AARP Diet and Health Study to prospectively examine the association between dietary inflammatory potential and pancreatic cancer and examine the effect modification by important inflammation-related lifestyle factors including body mass index, cigarette smoking, diabetes history, alcohol drinking and use of non-steroidal anti-inflammatory drugs.

Methods: The analytical cohort consisted of 533,286 participants (314,162 men and 219,124 women) aged between 50 to 71 years at baseline. Energy-adjusted dietary inflammatory index (E-DII) scores were computed based on food and supplement intake. The outcome was defined as incident primary adenocarcinoma of the exocrine pancreas. Cox proportional hazards models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) with participants in the lowest E-DII quintile (most anti-inflammatory scores) as referent. Effect modification was examined by adding a cross-product of each effect modifier as a categorical variable with E-DII quintile in the multivariable-adjusted model.

Results: After a median 13.4 years of follow-up, a total of 2,824 primary pancreatic cancer cases occurred. After controlling for confounders, there was no significant association between E-DII scores and pancreatic cancer risk among both men (HRQ5vsQ1=1.00, 95% CI=0.86-1.17, P-trend=0.83) and women (HRQ5vsQ1=1.00, 95% CI=0.83-1.22, P-trend=0.82). Inflammatory potential of diet was not associated with pancreatic cancer by cancer stage or grade. The E-DII and pancreatic cancer association was not modified by any of the inflammation-related lifestyle factors.

Conclusion: Our study did not support an association between inflammatory potential of diet and pancreatic cancer. No significant effect modification between the E-DII and other inflammation-related lifestyle factors on pancreatic cancer etiology were detected.

106-T

Socioeconomic status across the life course and cancer risk behaviors among older adults in rural South Africa

Kobayashi LC

Socioeconomic status (SES) at various points across the life course may influence cancer risk behaviors in later-life, although this relationship has rarely been investigated in rural, low-income settings. Using interview data from "Health and Aging in Africa: A Longitudinal Study of an INDEPTH Community in South Africa" (HAALSI), a population-based study of adults ≥ 40 years in rural South Africa in 2015 (n=5059), we aimed to estimate the associations between life course SES indicators (father's occupation during childhood, education, and current household wealth) and cancer risk behaviors. The associations between each life course SES indicator and engaging in < 210 min/week of moderate-to-vigorous physical activity (MVPA), having an overweight/obese BMI, drinking alcohol ≥ 5 days/week, and current smoking were estimated in mixed effects logistic regression models adjusted for age, sex, and country of birth, allowing for clustering by village of residence. Overall, 57% of participants engaged in < 210 min/week of MVPA, 59% had an overweight/obese BMI, 6% drank alcohol ≥ 5 days/week, and 9% were current smokers. Low-skill father's occupation (vs. high-skill) was associated with increased odds of low MVPA (OR=1.33; 95% CI: 1.17-1.52), but no other risk behaviors. Having no education (vs. any) was associated with increased odds of low MVPA (OR=1.27; 95% CI: 1.11-1.49) and drinking alcohol ≥ 5 days/week (OR=1.75; 95% CI: 1.31-2.32), and reduced odds of overweight/obese BMI (OR=0.86; 95% CI: 0.74-1.01). Being in the poorest household wealth quintile (vs. richest) was associated with reduced odds of low MVPA (OR=0.78; 0.65-0.94) and overweight/obese BMI (OR=0.34; 95% CI: 0.27-0.42), and increased odds of smoking (OR=6.24; 95% CI: 4.23-9.20) and drinking ≥ 5 days/week (OR=2.93; 95% CI: 2.29-3.73). Behaviors did not cluster within villages, except for MVPA. Results indicate high prevalence of overweight/obesity and low physical activity among older, rural South Africans. These problems are concentrated among those of higher SES, opposite to trends previously observed in high-income countries and urban areas. Future work should investigate how to best support older adults living in rural, low-income areas in sub-Saharan Africa to engage in cancer-protective behaviors.

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107-T

Effects of HIV status on response to treatment for non-metastatic cervical cancer patients in Lusaka, Zambia

Trejo MJ, Kalima M, Lishimpi K, Harris RB, Mwaba CK, Chuba A, Chama E, Msadabwe SC, Jacobs E, Banda L, Soliman AS

PURPOSE: The purpose of this study was to measure any differences in cervical cancer progression between HIV-positive and HIV-negative individuals in a high-risk region.

BACKGROUND: Cervical cancer is the fourth most common cancer among women worldwide, with highest incidence and mortality occurring in Sub-Saharan Africa. In Zambia, the annual incidence is 58/100,000 and the mortality rate is 36.2/100,000, making it the most common cause of cancer morbidity and mortality among women. HIV is a known risk factor for cervical cancer development and, with a national adult prevalence of 16%, women in Zambia are at high risk. The Cancer Diseases Hospital (CDH) in Lusaka, Zambia is the only tertiary hospital in country that provides specialized cancer treatment; about one third of their cervical cancer patients are HIV positive. This internship sought to develop a database of cervical cancer case information and study if co-infection with HIV was associated with cancer treatment response.

METHODS: This case-case study included 577 FIGO stage I and II cervical cancer patients seen at the CDH between 2008 and 2012. Abstracted data from cancer medical records included age, residence, occupation, comorbidities, cancer treatment information, and tumor response to cancer treatment. An algorithm was developed to link cancer data to the national HIV database to obtain additional information about HIV status, treatment, and compliance.

RESULTS: Approximately 43% of patients were HIV positive. Of patients who completed their first cycle of radiotherapy, 27% had gross residual tumor and 20% had progressive disease that resulted in distant metastasis. There was no statistically significant difference in progression by HIV status.

CONCLUSION: Future data analyses will assist in developing cancer education programs for cervical cancer patients about the importance of HIV treatment compliance in improving survivorship. Also, the results will help in professional education of oncologists for better monitoring and management of cervical cancer patients during the course of their treatment.

108

Childhood body size and midlife mammographic breast density in a predominantly U.S. racial minority and immigrant sample

Athilat S, Rodriguez CB, Tehranifar P

Mammographic breast density (MBD) is a strong and independent risk factor for breast cancer. While childhood and adolescent body size have been associated with reduced breast cancer risk, research on early life body size influences on MBD is sparse and varies by menopausal status. The few studies in racially/ethnically diverse populations have produced mostly null results. Our purpose was to examine the effects of childhood body size on absolute and relative quantitative measures of MBD in a sample of midlife women of predominately U.S. racial/ethnic minority and immigrant backgrounds. We used data collected from the New York Mammographic Density Study, an ongoing study of breast cancer screening and prevention in diverse women, recruited through a screening mammography facility in New York City (n=518, 40-64 years, 71% Hispanic; 68% foreign-born). We collected interview data on breast cancer risk factors, self-reported body size at age 10 using a 9-figure pictogram, measured height and weight, and measured MBD from digital mammograms using Cumulus software. We used linear regression models to examine childhood body size in relation to percent and areas of dense and non-dense breast tissue, adjusting for age and BMI at mammogram, race, parity, family history, benign breast disease, and educational attainment. We observed a pattern of decreasing percent density and increasing non-dense area with higher levels of childhood body size (heaviest vs. leanest childhood body size comparison on square root [SQT] transformed percent density: $\beta = -0.6$; 95% CI: -1.0, -0.1; SQT non-dense area: $\beta = 1.2$; 95% CI: 0.5, 2.0). In multivariable models separately stratified by nativity and menopausal statuses, heaviest vs. leanest childhood body size was associated with lower percent density and smaller dense area in only U.S.-born women (e.g., -1.0; 95% CI: -1.7, -0. for SQT percent density), and with lower percent density, smaller dense area, and larger non-dense area only in postmenopausal women (e.g., $\beta = -1.2$; 95% CI: -1.9, -0.6 for SQT percent density). These findings suggest that heavy childhood body size is associated with lower MBD, possibly through increased non-dense breast area in postmenopausal and U.S.-born women.

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Use of World Trade Center Health Program Data to Assess Risk Factors for Head and Neck Cancer; Preliminary findings

Black T, Manderski M, Malik P, Black K, Davis C, Giuliano A, Udasin I, Steinberg M, Lucchini R, Moline J, Crane M, Harrison D, Luft B, Graber J

Purpose: Excess cancer has been reported among workers and volunteers who participated in the rescue and recovery efforts following the 9/11 World Trade Center (WTC) attacks. This study explores the use of WTC Health Program (WTC-HP) alcohol and tobacco use data -- two population behavioral risk factors for head and neck cancer (HNC) -- for understanding HNC risk in this population.

Methods: The WTC-HP provides medical monitoring and treatment for eligible WTC workers and volunteers. Annual medical monitoring visits include self-administered questionnaires about health and WTC exposure. Data from consenting participants are managed by the WTC General Responders Data, which performs linkages with the state-based cancer registries to verify and update cancer diagnoses. We used a nested case-control design: cases were diagnosed with HNC (standard ICO-3 for oropharyngeal and laryngeal cancer); controls (8:1) were selected by risk-set sampling based on case diagnosis age and date, then matched on sex and race/ethnicity within risk sets. Differences in the distribution of WTC exposure intensity and duration, self-reported alcohol consumption (moderate/heavy drinkers/former heavy drinkers vs. non-/occasional drinkers) and cigarette smoking at first visit (current, former, never) between cases and controls were assessed using bivariate analysis and conditional logistic regression.

Results: In this preliminary analysis the 71 cases did not differ from the 594 controls in terms of WTC exposure (OR high vs. low exposure =0.9, 95% CI: 0.4, 2.0) or tobacco use (OR ever vs never=1.0, 95% CI: 0.9, 1.8). A positive association was observed between higher alcohol consumption and HNC (OR=1.6; 95% CI: 0.9, 2.8.; p=. 11)

Conclusions: The null and non-significant associations with HNC onset were surprising and may indicate: underreporting of risk behaviors; misclassification of WTC exposure; a strong unmeasured causal risk factor e.g. oral infection with oncogenic human papillomavirus; heterogeneity in associations across anatomical sites; and/or inadequate power. Future analyses will include more cases and controls as well as refined and longitudinal risk factor assessments to examine the value of WTC-HP data for epidemiologic analyses of cancer risk.

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Preliminary Findings of Tailored Tobacco Cessation Services with Short Messaging in the Arizona Smokers' Helpline (ASHLine)

Crane TE, O'Connor PA, Slack SD, Brady BR, Franks H, Krupski LA, Nair U, Thomson CA

Background: Tobacco remains the leading cause of preventable death in the United States. Evidence based guidelines recommend combination treatment of counseling and nicotine replacement therapy (NRT) to achieve optimal tobacco quit outcomes. The Arizona Smokers' Helpline (ASHLine) is a no-cost resource available for Arizonans who want to quit tobacco. Clients receive telephone coaching and an optional 4-week supply of NRT. While person to person coaching is ideal for tobacco cessation, evidence for the role of short message service (SMS) in achieving successful quit is growing. ASHLine has integrated an optional bidirectional SMS exchange program to supplement existing clinical services, initiated by the quit coach upon client approval. Goals of the program include improved client engagement and retention and, long-term higher quit rates. Here we present preliminary findings of the bidirectional SMS program.

Methods: Clients who enrolled in ASHLine between Oct. 1, 2016 and Nov. 22, 2017 were queried about receipt of supplemental SMS from their coach and/or to receive an automated series of Quit Support SMS (QSSMS). Clients were stratified by SMS status (receiving or not receiving SMS). Chi-Square and Fisher's exact test were used to compare groups.

Results: Over 2,000 clients (17%) opted to receive SMS. Over 14,170 SMS messages were sent, 59% belonged to a specific QSSMS series. Clients communicated with coaches via 5,198 SMS messages. Of the 4 available series, the "Active Quit Series" was most frequently subscribed. Clients choosing to receive SMS messages were younger (mean age 51 y. versus 55 y. p <0.01), more likely to be uninsured, and used NRT as part of their quit than those who did not opt for SMS. Clients who engaged in SMS completed more coaching calls than those who did not with 6.6 versus 5.2 calls, respectively (p <0.001). Early evaluation of 7-month quit data (n=114) indicate no difference in quit rates by SMS status (31% versus 34.5%).

Conclusions: Initial findings suggest SMS programming is feasible especially among younger, uninsured clients. More research is warranted on the use of SMS to engage and retain clients in smoking cessation programs.

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111-T

Longitudinal changes in volumetric breast density in healthy women across the menopausal transition.

Engmann NJ, Scott CG, Jensen MR, Winham SJ, Ma L, Brandt K, Mahmoudzadeh A, Malkov S, Whaley DH, Hruska C, Wu F, Miglioretti DL, Norman AD, Heine J, Shepherd J, Pankratz VS, Kerlikowske K & Vachon CM

Purpose: Many women experience declines in mammographic breast density during menopause, with some women experiencing greater reductions than others. We assessed changes in volumetric breast density across the menopausal transition and factors that influence these changes.

Methods: Women without a history of breast cancer, mastectomy or implants who had full field digital mammograms during both pre- and postmenopausal periods, at least 2 years apart, were sampled from 4 facilities within the San Francisco Mammography Registry from 2007 to 2013. Volumetric percent density (VPD) and dense volume (DV) were assessed using VolparaTM on all available digital mammograms across the time period. Risk factors (body mass index (BMI), alcohol use, parity, age at first birth, race, hormone therapy and family history) were self-reported at each mammogram. Annualized change in volumetric density measures from pre- to post- menopause were estimated using linear mixed models, adjusting for age, density and BMI at baseline, and BMI change from baseline. Multiplicative interactions were evaluated between baseline risk factors and time to determine if these covariates modified the annualized changes.

Results: Among the 2587 women who met inclusion criteria, 1767 had two mammograms, 655 had three, and 165 had four. Mean age was 50.5 (range: 35-54) years at premenopausal mammogram, and median time between earliest and latest mammograms was 3.0 (IQR: 2.0, 3.3) years. Women experienced an annualized decrease in both VPD (-0.6%) and DV (-2.2 cm³) over the time period. Annualized declines were greater among women with a baseline VPD above a median VPD of 11.9% vs. below (VPD: -1.0% vs. -0.2%, $p < 0.0001$) and baseline DV above a median DV of 58 cm³ vs. below (DV: -3.4 cm³ vs. -1.0 cm³, $p < 0.0001$). Women with baseline BMI < 25 kg/m² had greater declines in VPD than those with BMI ≥ 30 kg/m² (-0.8% vs. -0.1%, $p < 0.001$), though changes in DV by BMI were not significant (-2.0 cm³ vs. -2.5 cm³, $p = 0.46$).

Conclusion: High baseline breast density and BMI < 25 kg/m² were predictors of greater reductions in volumetric density across the menopausal transition. Future research should examine if volumetric density declines across the menopausal transition are associated with decreased breast cancer risk.

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Intervention Designs to Optimize Endocrine Therapy Adherence in Breast Cancer Survivors: A Meta-analysis of Available Trials

Finitis DJ, Vose B, Mahalak, JG

As secondary prevention, endocrine therapy (ET) can reduce risk of recurrence among most breast cancer survivors. For other women with genetically mediated family histories, these drugs may prevent a primary breast cancer. While efficacious in clinical trials, the effectiveness of any medication hinges upon medication adherence behavior. Many breast cancer survivors do not adhere to ET as prescribed. Researchers have trialed interventions to enhance adherence with conflicting results. The aim of this meta-analysis was to estimate the overall effect size of interventions to promote ET adherence among breast cancer survivors and test how study design moderates effect. We conducted literature searches through June 2017 using multiple electronic databases and hand searches of conference abstracts from 2015 through June 2017. Studies were included that: 1) sampled breast cancer survivors receiving ET; 2) tested an ET adherence intervention; 3) measured ET adherence; and 4) provided sufficient data to calculate effect sizes. Study information was extracted in duplicate using a standardized, piloted coding form and all effect sizes were calculated using random effects assumptions. From 1207 search results 8 interventions were included representing 1437 women with early stage breast cancer. Most ($k = 6$) studies compared participants receiving ET against a control group; one study used a single group pre-post design. Interventions were educational in content, most ($k = 5$) using hard copy letter format; fewer studies relied on phone ($k = 2$) or smartphone app ($k = 1$). Total aggregate effect size was null ($d = .28$; 95% CI = -.05, .61) suggesting no effect. However this model showed significant heterogeneity among individual study effect sizes (Cochrane's $Q = 55.23$). Moderator analyses revealed that interventions that promoted bidirectional communication between patient and care team in their design showed enhanced effect size ($d = .59$; 95% CI = .23, .95) with attendant reduction in model heterogeneity (Cochrane's $Q = 25.12$).

Conclusion: breast cancer survivors may improve ET adherence when interventions increase opportunities for communication and engagement. Future interventions may wish to consider these design elements to optimize ET adherence in this population.

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Fecal Akkermansia muciniphila is associated with body composition and microbiome alpha diversity in overweight and obese women with breast cancer participating in a presurgical weight loss trial

Frugé AD, Van Der Pol W, Tsuruta Y, Rogers LQ, Morrow CD, Demark-Wahnefried W

Background: Akkermansia muciniphila is a beneficial gram-negative mucin-degrading bacterial species inhabiting the gastrointestinal tract that has been associated with host phenotypes and disease states in preclinical models and humans. This secondary analysis of a randomized controlled weight loss trial in breast cancer patients sought to explore characteristics of women with low (LAM) vs. high (HAM) A. Muciniphila relative abundance.

Methods: Thirty-two women (body mass index >25) were randomized to hypocaloric diet and aerobic exercise to achieve 1kg weekly weight loss (n=17) or attention control (n=15) between their time of diagnosis with early stage (0-II) breast cancer until lumpectomy. Two-24 hour dietary recalls were collected at baseline and follow-up in conjunction with dual x-ray absorptiometry (DXA) and collection of fecal samples. Bacterial DNA was isolated and the V4 region of the 16S RNA gene was PCR-amplified and analyzed. Differences between study arms and between LAM and HAM were analyzed using t-tests for normally distributed data and non-parametric tests were used for microbiome data analysis.

Results: Participants were 61±9 (mean±SD) years old, and received the intervention 30±9 days. At baseline, LAM had lower bodyweight (97.0±13.6 kg vs. 85.4±17.6 kg, p=0.046) and fat mass (46.4±9.0 kg vs. 38.9±11.2 kg, p=0.044) than HAM. Differences persisted between LAM and HAM in bodyweight (p=0.0048) and fat mass (p=0.039) at follow-up. Alpha diversity, measured by species richness, was higher in HAM (360.8±84.8 vs. 282.4±69.6, p=0.008) at baseline, which was slightly attenuated at follow-up (p=0.58). Change in total dietary fiber was positively associated with change in A. Muciniphila in LAM (p=0.626, p=0.002), but not HAM (p=0.436, p=0.180).

Conclusion: A. Muciniphila may mediate the effects of dietary fiber in improving microbiome composition through dietary intervention.

114-T

Gender Differences in the Relationship between Risk of Advanced Colorectal Neoplasia and Changes in Waist Circumference and BMI from early to late adulthood

Gathirua-Mwangi WG, Monahan PO, Champion VL, Song Y, Zollinger TW, Stump TE, Imperiale TF

Introduction: Obesity is an established risk factor for Colorectal cancer (CRC), however, consistent results show that the association is stronger in men than women. The role of gender in the relationship of obesity and CRC risk remains unclear.

Therefore, we sought to examine gender differences in the relationships between risk of advanced colorectal neoplasia (AN) and early measures (age 21) and changes in waist circumference (WC) and Body mass Index (BMI)

Methods: In 4,449 adults (2,283 women), ages 50-80, with no previous neoplasia and undergoing screening colonoscopy were included in the study. Changes in BMI were categorized as 1) increase from normal to overweight or to obese, 2) increase from overweight to obese, and 3) stable BMI (stable-normal, stable-overweight or stable-obese) at age 21 and time of screening. Changes for WC were categorized as 1) increase from a low-risk WC to a high-risk WC (females ≥35 inches and males ≥40 inches), and 2) stable-risk WC at age 21 and time of screening. Known CRC risk factors were controlled in the logistic models and interaction p-values were used to determine gender differences.

Results: Although no gender differences were observed, being obese (OR=2.7, 95% CI 1.26-5.21) or having a large WC (OR=2.0, 95% CI 1.37-3.02) at age 21 in women was associated with risk of AN. No relationship between risk of AN and changes in BMI or WC was observed in men, but a monotonic relationship was observed in women. Increased risk of AN was associated with increases in BMI from normal to obesity (OR=1.8, 95% CI 1.07-3.03), overweight to obesity (OR=2.1, 95% CI 1.02-4.45), or having a stable-overweight BMI (OR=3.8, 95% CI 1.41-10.32) or stable-obese BMI (OR=4.1, 95% CI 1.80-9.17) compared to women a stable-normal BMI. Independent of BMI change, risk of AN was associated with increase in WC from low to high-risk (OR=2.1; 95% CI 1.20-3.51) or having a stable-high risk WC (OR=2.7; 95% CI 1.15-6.41) compared to women with a low-risk WC.

Conclusion: Changes in BMI and WC from early adulthood to time of screening are associated with risk of AN, with a stronger association in women. The findings underscore the importance of maintaining a healthy BMI and low-risk WC throughout adulthood.

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115-T

Maternal physical activity during pregnancy and onset of breast development in their daughters in the LEGACY Girls Study cohort

Goldberg M, Andrulis IL, Bradbury AR, Buys SS, Daly MB, John EM, Knight JA, Keegan THM, Schwartz LA, Wei Y, Terry MB

Earlier onset of breast development (thelarche) increases risk of breast cancer, independent of age at menarche. Given the decline in age at thelarche, it is important to examine whether modifiable factors are related to thelarche. Maternal factors including pre-pregnancy body mass index (BMI) and gestational weight gain (GWG) are related to timing of their daughter's menarche and thelarche. Less is known about whether maternal physical activity during pregnancy is related to thelarche. Using longitudinal Weibull models, we assessed whether maternal physical activity during pregnancy at home, at work and recreationally, reported by the mother at baseline, was associated with thelarche, defined as maternal report of Tanner stage 2+, in 599 girls from a prospective cohort in which approximately half of the girls have a history of breast cancer in a first- or second- degree relative (BCFH). We used maternal reports of thelarche during follow-up or recalled age at thelarche for girls that entered the cohort at Tanner stage 2+. We adjusted for age, race/ethnicity, maternal pre-pregnancy BMI and GWG, and examined mediation by daughter's BMI-for-age percentile between ages 5-7 years. We conducted sensitivity analyses in 263 girls ages 5-7 years at baseline with prospective data only. Daughters of mothers that reported no regular recreational physical activity during pregnancy experienced earlier thelarche than daughters of highly active mothers, independent of maternal BMI (adjusted Hazard Ratio (aHR)=1.63, 95% Confidence Interval (CI)=1.09-2.45). The association between maternal inactivity during pregnancy and thelarche did not materially change after considering GWG (aHR=1.53, 95% CI 1.03, 2.27) or daughter's BMI percentile (aHR=1.68, 95% CI 1.12-2.51). Associations were stronger in girls ages 5-7 years (aHR=1.98, 95% CI 1.14-3.45). Maternal physical activity at work or home were not associated with daughter's thelarche. In a cohort enriched for BCFH, we found that maternal physical inactivity during pregnancy is associated with earlier thelarche in their daughters, independent of maternal BMI, GWG and childhood body size. These findings suggest that modifying physical activity during pregnancy could reduce breast cancer risk in the next generation.

116-T

A dietary pattern based on estrogen metabolism is associated with postmenopausal breast cancer risk in a prospective cohort of women

Gunter MA, McLain AC, Merchant AT, Sandler DP, Steck SE

Increased exposure to estrogen is an established risk factor for postmenopausal breast cancer, and dietary factors have been shown to influence estrogen metabolism. However, results of diet and breast cancer studies have been inconclusive. We developed a dietary pattern associated with serum levels of unconjugated estradiol (E2) and the ratio of 2- to 16-hydroxylated estrogen metabolites (2/16 ratio) in a subsample (n=653) of the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (PLCO) using reduced rank regression. We examined the association between the estrogen-related dietary pattern (ERDP) with prospectively collected postmenopausal breast cancer outcomes in the larger PLCO cohort (n=27,488) with Cox proportional hazards models. The ERDP, which positively correlated with E2 ($r=0.27$; $p<0.0001$) and inversely correlated with the 2/16 ratio ($r=-0.16$; $p<0.0001$), was comprised of positively weighted intakes for non-whole/refined grains, tomatoes, cruciferous vegetables, cheese, fish/shellfish high in ω -3 fatty acids, franks/luncheon meats and negatively weighted intakes for nuts and seeds, other vegetables, fish/shellfish low in ω -3 fatty acids, yogurt, and coffee. During 298,390 person-years there were 1,592 confirmed incident cases of breast cancer (n=1,248 invasive). A 1-unit increase in the ERDP score (range of -4.52 to 6.58) was associated with a 9%, 13%, and 13% increase in total (HR: 1.09, 95%CI: 1.01-1.18), invasive (HR: 1.13; 95%CI: 1.04-1.24) and estrogen receptor positive (ER+; HR: 1.13, 95%CI: 1.02-1.24) breast cancer risk, respectively, after adjustment for confounders. Associations were seen for the fourth quartile of ERDP for overall breast cancer (HR: 1.14; 95% CI: 0.98, 1.32), invasive (HR: 1.20, 95%CI: 1.02, 1.42) and ER+ (HR: 1.19; 95%CI: 0.99-1.41) breast cancer compared to the first quartile. The increased risk associated with increasing ERDP scores was more apparent in strata of some effect modifiers (hormone replacement therapy and obesity) where participants' relative estrogen exposure was lowest. Our results suggest that a dietary pattern associated with estrogen metabolites may influence postmenopausal breast cancer risk.

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Can text message reminder content improve cervical screening participation: A randomised controlled trial

Huf S, King S, Kerrison R, Chadborn T, Richmond A, Cunningham D, Friedman E, Shukla H, Tseng F, Judah G, Vlaev I, Darzi A

Introduction It is estimated that 83% of cervical cancer deaths could be avoided through regular screening. Between 2011 and 2016 coverage fell from 75.7% to 72.6% in England, and from approximately 69.5% to 66.7% in London. Recent evidence has shown that text message reminders (SMS-R) improved participation in breast and bowel cancer screening, and that the message content within an SMS-R can further affect attendance rates at outpatient appointments.

Purpose We tested the effect of modifying SMS-R content on cervical screening uptake (i.e. attendance after invitation) in a low-coverage London borough. Methods Women aged 30 years and older, invited for screening from Feb 16, 2015, to Oct 5, 2015 were randomised to one of seven trial arms (1:1:1:1:1:1:1) using a random number generator, to receive no SMS-R or one of six SMS-Rs: a simple reminder, GP-endorsement, total and proportional social norms messages (communicating screening rates of peers) and gain and loss-framed messages (lives saved and lives lost associated with participating in screening). Women aged 25-29 years were randomised (1:1) to no SMS-R or a GP- endorsed SMS-R. Recipients were blinded to SMS-R content of other trial arms. The primary outcome was the percentage screened by 18 weeks. The data was analysed using logistic regression, adjusted for age, IMD decile.

Results In total, 1568, 1522, 1493, 1514, 1488, 1560 and 1507 women aged 30-64 years were allocated no SMS-R, a simple reminder, GP-endorsement, total social norms, proportional social norms, gain or loss-framed SMS-R, respectively. The greatest difference in uptake was between no SMS-R (34.4%, n=540) and GP- endorsement (38.4%, n=575) (OR 1.19, 95% CI 1.03-1.38, p=0.02), followed by the simple SMS (38.1%, n=580) (OR 1.18, 95% CI 1.02-1.37, p=0.03). No overall significant difference between the control and other trial arms was observed. Participation among the 1453 and 1482 women aged 25-29 years randomised to no SMS-R or a GP-endorsement was 26.4% (n=384) and 31.4% (n=466) respectively (OR 1.29, 95% CI 1.09-1.51, p=0.002).

Conclusion SMS-R messages can improve cervical screening uptake. The behavioural sciences can inform the message content that has the biggest impact on screening participation.

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Development, Delivery and Impact of the Transdisciplinary Research in Energetics and Cancer (TREC) Training Course

Irwin ML, Lowry D, Neuhouser M, Patterson R, Ligibel J, Schmitz K, Colditz G, Nebeling L

Purpose: Obesity, poor diet and physical inactivity increase the risk of many cancers. In addition to public health efforts to improve these behaviors, it is critical that scientists receive training in conducting rigorous and impactful energy balance and cancer research. To address this need, we developed an NCI-funded research education program to offer, evaluate and disseminate an annual 5-day transdisciplinary (TD) research in energetics and cancer (TREC) training course for postdoctoral fellows and junior faculty (R25CA203650). The goal of this course is to enhance the ability of course participants to conduct innovative, TD research in energetics and cancer research.

Methods: The course builds upon the 2005 to 2016 NCI TREC Initiative, which was a major scientific research effort that covered topics across the cancer control continuum. The annual 5-day course, delivered June 2017-2021, provides evidence-based energetics and cancer training. A TD team of ~20 expert faculty members participate each year as TREC Faculty. Details regarding the course and application to participate as a TREC Fellow are available via a website (www.trectraining.yale.edu). Finally, we assess knowledge and skills in energetics and cancer before and immediately after the 5-day workshop that are analyzed with the Wilcoxon Signed Rank Test.

Results: Information about the course was shared with ~30 organizations, resulting in 77 applications for the inaugural 2017 year. Twenty TREC Fellows were accepted into the program, including 3 basic, 7 clinical, and 10 population scientists. Fifteen of the TREC fellows were junior faculty and 5 were postdoctoral fellows. The 5-day course included over 50 lectures, small-group breakouts and one-on-one faculty-fellow sessions. After participating in the TREC Training Workshop, knowledge related to conducting energy balance and cancer research, as well as TD research competencies, significantly improved in 37 out of 39 competencies (94.8%).

Conclusion: The impact of this TD course will be defined by the degree to which course participants produce innovative research approaches and discoveries that, may improve the health of the population at risk for cancer as well as cancer survivors.

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Selenium supplementation for chemoprevention and odds of development of diabetes: A systematic review

Kohler LN, Shelly C, Chow H-H, Hsu P, Ellis N, Martinez JA, Lance P, Kelley C, Florea A, Jacobs ET

The trace element selenium (Se) gained momentum as a potential chemopreventive agent with the publication of the results of the Nutritional Prevention of Cancer (NPC) trial in 1996, wherein secondary analyses revealed statistically significant reductions in colorectal and prostate cancer incidence for those in the Se supplementation arm compared to placebo. More recently, there has been evidence of an increased risk for diabetes among individuals who received Se as compared to those randomized to placebo in the NPC and other chemoprevention trials. We therefore conducted a systematic review of the literature to determine whether selenium is related to risk of diabetes. We employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and identified a total of seven observational studies and three clinical trials that were eligible for inclusion. Of the observational studies, one case-control and four cross-sectional studies reported significantly increased odds for diabetes among those with the highest category of serum selenium levels compared to the lowest; while the results of two case-control studies showed no significant differences between those with and without diabetes for whole blood selenium levels. With regard to clinical trials, a total of three completed chemoprevention trials comprising over 20,000 participants were identified for inclusion: the NPC Trial, the Selenium and Vitamin E Cancer Prevention Trial (SELECT) and the Selenium Trial (SEL). In the NPC Trial, the reported hazard ratio (95% confidence interval) for the development of diabetes among those supplemented with Se vs. placebo was 1.55 (1.03-2.33). For SELECT, the HR (95% CI) was 1.07 (0.94-1.22); while for SEL, it was 1.25 (0.74-2.11). After combining the data from these trials, the OR (95% CI) for diabetes among those supplemented with Se vs. placebo was 1.11 (1.00-1.23). These results suggest that there may be a modest increase in the odds of diabetes with higher circulating Se concentrations or with Se supplementation for chemoprevention. However, further work is required to ascertain if there is heterogeneity of treatment effect among study participants by variables such as age, genetic background, baseline selenium status, or sex.

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Joint associations of maternal gestational weight gain, pregravid obesity and onset of breast development in daughters

Aghaee S., Laurent CA., Deardorff J., Kurtovich E., Kushi LH., Greenspan LC., Quesenberry, Jr C., Ferrara A., Kubo A.

Purpose: To assess the joint associations between maternal gestational weight gain (GWG) and pregravid obesity on the timing of the onset of breast development (thelarche) in girls. Early puberty is a known risk factor for reproductive cancers, and the age of pubertal onset has decreased significantly over the past few decades. Investigation of modifiable, early life risk factors may help in the design of upstream cancer prevention strategies.

Methods: Retrospective cohort study of 2,206 mother-daughter pairs where daughters were born in 2006-7 at Kaiser Permanente Northern California (KPNC). We used pediatrician-assessed pubertal maturation (Tanner) staging, documented in KPNC's electronic health record to determine thelarche (transition from Tanner stage 1 to 2+). Maternal pregravid height and weights measured during pregnancy were used to calculate GWG, which was categorized according to the 2009 Institute of Medicine recommendations. We created six composite exposure variables: GWG by pregravid body mass index (BMI, kg/m²: <25 vs. ≥25). Weibull regression accommodating interval censoring were used in all analyses. All models were adjusted for maternal age, gestational age at delivery and race/ethnicity. We also examined mediation by girl's pre-pubertal BMI.

Results: The associations between GWG (exceeding or gaining below the recommendations) and risk of earlier thelarche were stronger and significant if mother had pregravid BMI>25. For instance, girls whose mother had BMI>25 and exceeded or gained below the GWG recommendations were at over 50% higher risk of experiencing earlier thelarche compared to girls whose mother met GWG recommendation and had BMI<25 [adjusted hazard ratio (HR)= 1.82; 95% confidence interval (CI) 1.47-2.26; HR=1.54; 95% 1.15-2.04, respectively]. When girl's BMI was included in the model, these associations were slightly attenuated but the association for excess GWG + BMI>25 remained significant [HR=1.53; 95%CI 1.22-1.91].

Conclusions: Maternal obesity and GWG may independently influence the timing of puberty in daughters, thereby increasing the risk of future cancers. Early life interventions such as monitoring of maternal weight before and throughout pregnancy, may have implications for future cancer risks in the offspring.

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Prolonged, uninterrupted bouts of sedentary behavior are associated with fatigue in breast cancer survivors

Leach HJ, Lebreton KA, Lyden K

Purpose: Sedentary behavior (SB) has been investigated as a factor in the development of several chronic diseases (e.g., obesity, diabetes). However, the relationship between SB and fatigue in cancer survivors has not been explored. This study examined associations between physical activity (PA), SB, and fatigue in breast cancer survivors.

Methods: A subsample of breast cancer survivors who completed an 8-week PA intervention (N=7) wore an activPAL accelerometer for seven-consecutive days at post-intervention. activPAL variables of interest were step count, minutes of moderate to vigorous PA (MVPA), bouts of MVPA >10 minutes, minutes in SB, and prolonged, uninterrupted bouts of SB >30 and >60 minutes. The Functional Assessment of Chronic Illness Therapy (FACIT) Fatigue questionnaire measured fatigue, higher scores indicate less fatigue. Pearson correlations explored associations between post-intervention fatigue and activPAL variables. Hierarchical regression models to predict post-intervention fatigue included cancer stage, baseline fatigue and significant ($p < .05$) univariate predictors.

Results: Fatigue improved from baseline to post-intervention [$M \Delta + 10.43 \pm 10.74$, $t(6) = -3.76$, $p = .009$]. Post-intervention fatigue was associated with bouts of SB >30 ($r = -.876$, $p = .01$) and >60 minutes ($r = -.861$, $p = .01$). No PA variables were associated with fatigue ($p > .05$). Cancer stage, baseline fatigue and SB >30 minutes predicted post intervention fatigue [$F(3,6) = 23.29$, $p = .014$, $R^2 = .96$]. SB >30 minutes accounted for an additional 32.5% of the variance [$B = -2.26$, $SE = .464$, $t(3) = -4.866$, $p = .017$]. The regression analysis for sedentary bouts >60 minutes was not significant [$F(3,6) = 3.13$, $p = .187$].

Conclusion: Reducing and/or interrupting prolonged sedentary time may improve fatigue in breast cancer survivors. These analyses found that eliminating 1.6 bouts of SB >30 minutes per day improved fatigue by 3.7 points on the FACIT, exceeding the minimal clinically important difference of 3. However, these large effects should be interpreted with caution due to the small sample size. In addition, SB and fatigue may have a bi-directional relationship, with higher levels of fatigue leading to more time in SB. Further research is needed to test how reductions in SB impact changes in fatigue.

122-T

Elucidating under-studied aspects of the link between obesity and multiple myeloma: a prospective assessment of the influence of the stability, trajectory, and distribution of body fatness

Marinac CR, Colditz GA, Townsend MK, Rosner BA, Suppan CA, Rebbeck TR, Giovannucci E, Song M, Kvarner AS, Birmann BM

Purpose: To examine the association of weight cycling, body fat distribution, and trajectory of body size across the lifespan with multiple myeloma (MM) risk.

Methods: We analyzed questionnaire data from 160,865 participants in the Health Professionals Follow-up Study (HPFS) and Nurses' Health Study (NHS). We derived weight cycling in adulthood from the question asked in 1992, "Within the last 20 years, how many times did you lose each of the following amounts of weight on purpose (excluding illness or pregnancy)." Waist circumference, hip circumferences, and waist-to-hip ratio were queried in 1986 for NHS and in 1987 for HPFS, and were updated over follow-up. Body size during childhood, adolescence, and adulthood were assessed in 1988 using 9-level "somatotype" pictograms and used to derive group-based trajectories of body size across the lifespan. We used multivariable Cox proportional hazards models to estimate cohort (sex)-specific hazard ratios (HR) and 95% confidence intervals (CI) for those obesity-related risk factors and, in final models, pooled data across both cohorts.

Results: We identified a pooled total of 530 incident cases of MM during 2,868,080 person-years of follow-up. Persons with a history of extreme weight cycling, defined as a total intentional weight loss that exceeded net weight loss in those reporting one or more episodes of loss of ≥ 20 pounds, had a 75% increased risk of MM compared to individuals who stably maintained their weight (HR: 1.75; 95% CI: 1.05, 2.94). We also observed that MM risk increased significantly by 4% with each 1-inch increase in hip circumference (HR: 1.04; 95% CI: 1.00, 1.08). We identified four distinct trajectories of body size between ages five and 60 years: lean-stable, lean-increase, medium-stable, and medium-increase. Compared with individuals in the lean-stable trajectory group, those in the medium-increase trajectory category had an increased risk of MM (HR: 1.57; 95% CI: 1.17, 2.12). No other variables examined were associated with MM risk.

Conclusions: Findings support the notion that maintaining a lean and stable weight throughout life will reduce the risk of MM.

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123-T

Impact of family history risk score on associations between breast cancer and physical activity in adulthood

Niehoff NM, Nichols HB, Zhao S, White AJ, Sandler DP

Background: Recreational physical activity has been consistently associated with a reduced breast cancer risk in women overall. Less is known about the impact of a family history of breast cancer on this association. This is an important consideration because extent of family history differentially affects risk for breast cancer and associations with other breast cancer risk factors have been shown to vary by family history.

Methods: The Sister Study is a prospective cohort of 50,884 women who each had a sister who was diagnosed with breast cancer, but did not have breast cancer themselves at baseline. Women reported their sport/exercise activities during the 12 months before enrollment. Average hours/week and MET-hours/week were considered in association with breast cancer overall and by estrogen receptor (ER) status. Hazard ratios (HRs) and 95% confidence intervals (CIs) were calculated with Cox regression. Extent of family history was characterized by a novel Bayesian score incorporating the population hazard function, family size, and number of breast cancer cases and age at diagnosis in first-degree female relatives. Modification by extent of family history was evaluated in stratified analyses with an interaction term between risk score and physical activity.

Results: During follow-up (mean=8.3 yrs), 3,053 breast cancer cases were diagnosed. Participation in ≥ 7 compared to < 1 hour/week of physical activity was associated with lower breast cancer risk overall (HR=0.85; 95%CI: 0.74-0.98). Inverse associations were evident for ER+ tumors (HR=0.84; 95%CI: 0.71-0.98), but not ER-. Family history risk score modified physical activity and overall breast cancer associations. Among those with low risk scores, ≥ 7 hours/week of physical activity was associated with a HR of 0.78 (95%CI: 0.63-0.97), compared to a HR of 1.06 among women with high risk scores (95%CI: 0.88-1.22).

Conclusions: Overall findings suggest that physical activity is beneficial in lowering breast cancer risk, even in women with a family history of breast cancer. The amount of benefit appears to vary with degree of familial risk. Nonetheless, women with a family history may have a heightened concern about their own risk, so becoming or remaining active may be a positive step they can undertake.

124-T

Physical activity is associated with improved quality of life and functional fitness among patients receiving preoperative therapy for pancreatic cancer

Parker NH, Ngo-Huang A, Petzel MQB, Fogelman D, Lee RE, O'Connor DP, Martinez VA, Katz MHG

Purpose: We sought to evaluate associations between physical activity (PA) and changes in health-related quality of life (QOL) and functional fitness among patients participating in a multi-modal, home-based exercise program concurrent with preoperative chemo- or radiation therapy for pancreatic cancer.

Methods: Patients (N=50, mean age 66.4+/-7.9yrs, 48% female) were encouraged to perform ≥ 60 min/week each of moderate-intensity aerobic and strengthening exercise during treatment. Patients reported aerobic and strengthening exercise daily throughout treatment, and light and moderate-to-vigorous PA were measured using Actigraph GT3X+ accelerometers during each treatment phase. Patients reported QOL and physical functioning using the FACT-Hep and PROMIS Short Form, respectively, and performed 6-minute walk (6MWT), 5x sit-to-stand (5xSTS) and grip strength tests upon enrollment and following treatment. Multivariable models evaluated associations between self-reported or objective PA and changes in QOL and functional fitness.

Results: 6MWT improved from 459.7+/-86.4m to 488.2+/-93.1m (p=.001), and 5xSTS improved from 11.4+/-4.2s to 10.6+/-3.6s (p<.05). Aerobic exercise was positively associated with improvements in self-reported physical functioning ($\beta=.02$, p=.03) and 6MWT ($\beta=.19$, p=.05). Light PA was positively associated with improvements in QOL ($\beta=.03$, p=.02), self-reported physical functioning ($\beta=.01$, p=.02), and 6MWT ($\beta=.08$, p=.03). Moderate-to-vigorous PA was positively associated with improvements in self-reported physical functioning ($\beta=.03$, p<.01) and 6MWT ($\beta=.18$, p=.03). Strengthening exercise was not significantly associated with change in any outcome, and there were no significant associations between PA and changes in 5xSTS or grip strength.

Conclusions: Self-reported and objective PA were associated with favorable changes in QOL and functional fitness among patients participating in a home-based exercise program concurrent with preoperative therapy for pancreatic cancer. Preoperative therapy provides a critical window to optimize and prepare patients for possible pancreatic cancer surgery, and our findings support the use of structured exercise programming to improve QOL and physical functioning in this context.

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125-T

Associations of energy intake, recent weight change, and physical activity with fecal and oral microbiota

Patel K, Hoffman KL, Zhang J, Ajami NJ, Petrosino JF, Schembre SM, Daniel CR

Modifiable behaviors that contribute to obesity and the microbiome are important targets for cancer prevention.

Objective: We examined associations of weight status, usual total energy intake (TEI), physical activity level, and recent weight change with the diversity and composition of the gut and oral microbiota in a human epidemiologic study.

Methods: In 66 self-reported healthy obese (BMI >30) and lean (BMI <25) adults, we collected fecal and buccal samples, two 24-hour dietary recalls, and the International Physical Activity Questionnaire. Recent weight change was defined as $\pm >5\%$ reported change in body weight within the past year. Human microbiota were characterized via 16S rRNA gene sequencing (IlluminaMiSeq).

Results: Two-thirds of the sample were women and the mean age was 34 ± 10 years. We observed no significant differences in microbial community richness and only modest differences in community structure by BMI and other factors. In obese as compared to lean participants' fecal samples, we observed higher relative abundance of *Megasphaera* (P=0.002; PFDR=0.12)- a finding largely driven by significant differences in women (PFDR=0.0003). In buccal samples, obesity was inversely associated with *Azospira* (P=0.01). Across tertiles of TEI, *Oscillibacter* increased (PFDR=0.006) in fecal samples, while *Megasphaera* appeared to increase in both fecal (P=0.06) and buccal (P=0.05) samples. In buccal samples, *Haemophilus* was marginally associated with increased usual physical activity. The fecal microbiota of participants who reported recent weight gain showed enrichment of several species within the Clostridiales order, including *Megasphaera*. Putative pathway differences in amino acid metabolism, carbohydrate metabolism, bacterial pathogenesis and motility, methane metabolism, and gluconeogenesis support the functionality of these compositional differences.

Conclusion: *Megasphaera* and *Oscillibacter* have previously been linked to BMI in studies of the fecal microbiome. Our results suggest TEI and recent weight change, as well as sex, may contribute to compositional and potential functional differences in both the oral and fecal microbiota of obese and lean persons.

126-T

Validity of self-reported weight, height and body mass index among African American breast cancer survivors: the Women's Circle of Health Follow-Up Study

Qin B, Llanos AAM, Lin Y, Szamreta EA, Plascak JJ, Oh H, Pawlish K, Ambrosone CB, Demissie K, Hong CC, Bandera EV

Background: Self-reported weight, height and body mass index (BMI) are commonly used in cancer epidemiology studies, but information on the validity of self-reports among cancer survivors is lacking. This study aimed to evaluate the validity of these self-reported measures among African American (AA) breast cancer survivors, known to have a high prevalence of obesity.

Methods: We compared the self-reported and measured values among 243 participants from the Women's Circle of Health Follow-Up Study (WCHFS), a population-based longitudinal study of AA breast cancer survivors. Multivariable-adjusted linear regressions were used to identify factors associated with reporting errors. We also examined the associations of self-reported and measured BMI with obesity-related health outcomes, using hypertension as an example, to evaluate the impact of misreporting.

Results: We found that self-reported and measured values were highly correlated among all and when stratified by participants' characteristics (intraclass correlation coefficients ≥ 0.99 , 0.84 and 0.96 for weight, height and BMI, respectively). The agreement between BMI categories (normal weight, overweight and obese) based on self-reported and measured data was excellent (kappa: 0.81). Women who were older, never smoked, had higher grade tumors, or had greater BMI tended to have over-estimated BMI calculated from their self-reported weight and height. The BMI-hypertension association was similar using self-reported values (OR per 5 kg/m² increase: 1.63; 95% CI: 1.27-2.10; P < 0.001) and measured BMI (1.58; 95% CI 1.23-2.03; P < 0.001).

Conclusions: Self-reported weight, height and BMI were reasonably accurate in the WCHFS. Our study supports the use of these self-reported values among cancer survivors when direct measurements are not possible.

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127-T

Interactions of coffee consumption and postmenopausal hormone use in relation to breast cancer risk in UK Biobank

Rich S., Mao L., Mai V., Egan K., Yaghjian L.

Purpose: We investigated the association of coffee consumption with postmenopausal breast cancer risk, overall and by the status of postmenopausal hormone therapy (PMH).

Methods: This study included 126,182 postmenopausal women (2,636 with breast cancer and 123,546 without) from UK Biobank. Cancer diagnoses were ascertained through the linkage to the UK National Health Service Central Registers. Information on breast cancer risk factors and coffee consumption was collected at baseline and updated during follow-up. We used Cox proportional hazards regression to evaluate associations between coffee consumption and breast cancer, overall and in stratified analyses by woman's PMH status (none, past, current).

Results: In the overall analysis, coffee consumption was not associated with breast cancer risk (Hazard Ratio [HR]=1.00, 95%CI 0.91-1.11 for 2-3 cups/day, and HR=0.98, 95%CI 0.87-1.10 for ≥ 4 cups/day, p-trend=0.69). Women with no PMH history who consumed ≥ 4 cups/day had a 16% reduced risk of breast cancer as compared to women who consumed < 7 cups/week (HR=0.84, 95%CI 0.71-1.00). Among women with past PMH, those consuming ≥ 4 cups/day had a 22% greater risk of breast cancer than women consuming < 7 cups/week (HR=1.22, 95%CI 1.01-1.47). No association was found among current PMH users. We found no significant interaction between PMH and coffee consumption (p=0.24).

Conclusions: Coffee consumption might be associated with decreased breast cancer risk in women with no history of PMH and with increased breast cancer risk in women who used hormones in the past. Further studies are warranted to confirm these findings and elucidate potential biological mechanisms underlying the observed associations.

128-T

Motivations for physical activity and the moderating effect of cancer survivorship: a nationally representative cross-sectional study

Robertson, MC; Liao, Y; Song, J; Lyons, EJ; Basen-Engquist, KM

The purpose of this study was to investigate whether history of cancer or other chronic disease moderates the relationships between type of motivation for physical activity and physical activity behavior. We conducted secondary data analysis using two waves (2012 and 2014) of the National Cancer Institute's nationally representative Health Information National Trends Survey (HINTS; n=7,307). We investigated the associations between self-reported aerobic moderate-to-vigorous physical activity (MVPA) and 4 potential motivators for physical activity (i.e. "pressure from others", "concern over the way you look", "feeling guilty when you skip exercising", and "getting enjoyment from exercise"); we dichotomized motivations into high vs. low for interpretability. We further evaluated each model by adding an interaction term for the motivator and cancer survivorship status, then similarly explored effect modification by diabetes, hypertension, and arthritis statuses. Compared to low, attributing high motivation to "getting enjoyment from exercise" was associated with 41.8% more MVPA (+74.7 min/week, p<.001). Conversely, citing high motivation due to "concern over the way you look" was associated with 20.4% less MVPA (-52.4 min/week, p=.003), compared to low; a similar marginally significant trend existed for "pressure from others" (-48.9 min/week, p=.065). We identified a significant interaction for "feeling guilty when you skip exercising" and cancer survivorship status (p=.028). In those without a history of cancer, this motivation was associated with 12.9% more MVPA (+27.6 min/week); in cancer survivors it was associated with 23.8% less MVPA (-55.6 min/week). There were no analogous interaction effects for diabetes, hypertension, or arthritis status. In accordance with the literature and consistent with Self-Determination theory, enjoyment was associated with more physical activity; strengthening this motivation may be a useful strategy for increasing adherence to recommended guidelines. Findings suggest that one's cancer experience may uniquely change the dynamic between guilt, motivation, and physical activity; caution should be taken not to assume that guilt has reparative utility for physical activity promotion in cancer survivors.

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129-T

Identifying distinct physical activity trajectories after a breast cancer diagnosis: the Pathways Study

Shi Z, Rundle A, Genkinger JM, Cheung YK, Kushi LH, Kwan ML, Greenlee H

Objective: To identify subgroups of breast cancer (BC) patients based on distinct trajectories of physical activity (PA) after a BC diagnosis, and to examine if socioeconomic, stress coping and cancer treatment-related factors are predictors of these trajectories.

Methods: The analysis used data from the Pathways Study, a population-based prospective cohort study of 4,505 women newly diagnosed with BC within the Kaiser Permanente Northern California between 2008 and 2013. Self-reported time spent on moderate-to-vigorous physical activity (MVPA) and sedentary behavior were collected using the Arizona Physical Activity Questionnaire at baseline, 6 and 24 months. Group-based trajectory modeling and K-means for longitudinal data analysis were used to identify trajectories of MVPA and sedentary behavior in 2,995 women with ≥ 2 PA assessments. Trajectory groups were defined based on baseline activity level (high, medium, low), direction of change (increase or decrease), and persistence of change (temporary or stable). Multinomial logistic regression was used to examine factors associated with MVPA and sedentary behavior trajectories.

Results: During the 24 months after a BC diagnosis, trajectory analyses identified three distinct trajectories of MVPA [high decrease-temporary (7%), medium decrease-temporary (35%), low stable (58%)] and four trajectories of sedentary behavior [high-stable (18%), medium increase-stable (24%), medium decrease-stable (27%), low stable (31%)]. Compared to participants in the low stable MVPA trajectory, women who followed the high or medium decrease-temporary MVPA trajectory had higher education, income, dispositional optimism, and perceived social support (all $P < 0.05$). Compared to the low stable trajectory of sedentary behavior, the high-stable and medium decrease-stable trajectories were associated with higher education, lower income, and higher perceived social support (all $P < 0.05$).

Conclusion: While most BC survivors in the Pathways Study maintained MVPA levels over 24 months after diagnosis, a considerable proportion of BC survivors reported decreased MVPA during this time. Higher education, optimism and perceived social support consistently characterized women with higher MVPA and lower sedentary behavior trajectories.

130-T

The potential for metformin to reduce obesity-associated breast cancer risk

Trujillo JS, Villa-Guillen DE, Tapia E, Cordova C, Chalasani P, Thomson C, Altbach M, Galons JP, Miller J, Roe D, Algotar A, Chow H-H.

Purpose of the study: To determine the potential effects of metformin on recognized and putative markers of breast cancer risk in women with elements of metabolic syndrome.

Statement of methods: We are currently conducting a Phase-II double blind, placebo-controlled clinical trial to study the effect of metformin on obesity-associated breast cancer risk in overweight and obese premenopausal women with metabolic disturbances. Patients who meet the inclusion criteria are randomized to receive metformin 850 mg BID or placebo for 12 months. Our primary endpoint is to monitor breast density through fat-water MRI. Our secondary endpoints include evaluating metabolic changes in serum insulin levels, insulin-like growth factor (IGF)-1 to insulin-like growth factor binding protein (IGFBP)-3 ratio, IGF-2 levels, leptin to adiponectin ratio, waist circumference, and body weight.

Summary of Results: Analysis is on going for the association between breast density and metabolic disorders. Our patient population offers us the unique opportunity to study the efficacy of metformin in Hispanic women compared to non-Hispanic women. 35 percent of our total patient population identify as Hispanic. In addition to this, 50 percent of our study population has at least 2 elements of metabolic syndrome, and the remaining 50 percent have 3 elements or more. The baseline characteristics of our patients, on average, are 39.5 years old, have a BMI of 37.8 kg/m², and a waist circumference of 110.8 cm.

Statement of Conclusions: As of November 2017, we have consented 235 women. 84 were ineligible, 4 are pending agent intervention, and 147 have been randomized and started intervention. We are expected to complete the trial in November 2018. Due to the rising rate of obesity, we believe that this trial will have an overwhelming impact in public health especially in minority populations where obesity-induced breast cancer continues to grow. Considering the challenges that many minority populations face, metformin can be used as a safe pharmacological alternative to women who are at risk for obesity-induced breast cancer. Our study will offer the opportunity for metformin to modulate metabolic markers that increase breast cancer risk in Hispanic women.

Poster Session Abstracts

131-T

Patterns of complementary and alternative medicine use and incident risk of breast cancer

Ulanday KT, Strizich G, Shi Z, Deming-Halverson SL, Sandler D, Greenlee H

Purpose: To examine the association of complementary and alternative medicine (CAM) use patterns with incident risk of breast cancer (BC).

Methods: CAM use and breast cancer risk factors were assessed at baseline (2003- 2009) among women in The Sister Study (n=43,172), a prospective cohort study following U.S. and Puerto Rican women with one or more sisters with BC, no personal history of BC, and aged 35-74 years. Incident breast cancer cases were collected through 2016 (Release 5.0). A latent class analysis (LCA) identified patterns of CAM use. Cox regression analyses provided adjusted hazard ratios (AHRs) for breast cancer incidence by LCA-derived CAM patterns.

Analyses adjusted for sociodemographic, health, behavioral, and BC risk factors and interaction by menopausal status was examined. A parallel propensity score (PS) matched analyses, to robustly control for confounding, was conducted using 1:1 matching of participants.

Results: Six distinct patterns of CAM use were identified. The largest group, labeled very low CAM use, comprised 38% of the cohort and was characterized by minimum use of multivitamins, spirituality/meditation, and therapeutic massage. Other patterns were characterized by predominant use of mind-body practices (13%), multivitamin plus calcium supplements (31%), common nutritional supplements (12%), multiple modalities (3%), and several vitamin and mineral supplements (2%). During 323,407 person-years at risk, we observed 2,320 cases of any BC and 1,731 invasive BC cases. Compared to very low CAM users, women who engaged in mind-body practices (e.g., spirituality/meditation, yoga, therapeutic massage, and chiropractic care) had a reduced risk of any BC (AHR=0.83; 95% Confidence Interval (CI)=0.73-0.96) and of invasive BC (AHR=0.82; 95% CI=0.69-0.96). Multivitamin plus calcium supplement users had a reduced risk of invasive BC (AHR=0.87; 95% CI=0.77-0.98). Findings were consistent across menopausal status. In PS matched analyses, however, multivitamin plus calcium supplement use was not associated with reduced risk of invasive BC.

Conclusion: In women at high risk of BC based on family history, use of mind-body practices was associated with a reduced risk of BC. Future studies should explore possible mechanisms related to these findings.

132-T

Associations of calcium and dairy product intakes with all-cause and cause-specific mortality among older women: the Iowa Women's Health Study

Um CY, Prizment A, Hong CP, Lazovich D, Robstick RM

To investigate associations of calcium, dairy products, and the non-calcium component of dairy products with all- cause, cancer, and coronary heart disease (CHD) mortality, we analyzed data from the prospective Iowa Women's Health Study of 55-69 year-old women without a history of cancer or cardiovascular disease who completed a semiquantitative food frequency questionnaire in 1986. Through 2012, 18,687 (53.1%) deaths were identified. To investigate intakes of total dairy and whole and low-/non-fat milks independent of their calcium components, we estimated residuals from linear regression models of their associations with dietary calcium. All associations were estimated using multivariable Cox proportional hazards regression. For those in the highest relative to the lowest quintile of total calcium, the adjusted hazard ratios (HRs) and 95% confidence intervals (CI) were 0.88 (CI 0.83-0.93; P-trend 0.001) for all-cause mortality, 0.91 (CI 0.81-1.02; P-trend 0.34) for all cancer mortality, 0.66 (CI 0.47-0.93; P-trend 0.01) for colorectal cancer mortality, and 0.73 (CI 0.64- 0.83; P-trend <0.0001) for CHD mortality. For those in the highest relative to the lowest quintile of supplemental calcium, the adjusted HRs were 0.92 (CI 0.87-0.98; P-trend <0.0001) for all-cause mortality, 0.90 (CI 0.79-1.02; P- trend 0.02) for all cancer mortality, 0.70 (CI 0.46-1.08; P-trend 0.05) for colorectal cancer mortality, and 0.74 (CI 0.63-0.86; P-trend <0.0001) for CHD mortality. The HRs for women who reported taking calcium but not vitamin D supplements, relative to those who reported taking neither, were 0.88 (CI 0.85-0.92) for all-cause mortality, 0.91 (CI 0.84-0.98) for all cancer mortality, 0.89 (CI 0.80-1.13) for colorectal cancer mortality, and 0.77 (CI 0.70-0.84) for CHD mortality. Dietary calcium, total and specific dairy products, dairy products residuals, and supplemental vitamin D use were not associated with all-cause or cause-specific mortality. These results suggest that calcium, but not dairy products, is inversely associated with all-cause, colorectal cancer, and CHD mortality among older women, and do not support previous findings that supplemental calcium may increase risk of cardiovascular disease mortality

Poster Session Abstracts

133-T

Healthy behavioral choices and cancer screening in individuals living with HIV/AIDS are different by biological gender and years since HIV diagnosis

Wijayabahu AT, Zhou Z, Cook R L, Brumback B, Whitehead N, Yaghjian L

Purpose: This study investigated the prevalence of healthy behaviors and gender- specific cancer screening in a cohort of HIV infected individuals in Florida, by biological gender and time since HIV diagnosis.

Methods: We included a total of 517 individuals with HIV from the Florida Cohort Study which recruits individuals through county health departments and community clinics. Data were obtained from the cohort baseline and follow up questionnaires, electronic medical records, and Enhanced HIV/AIDS Reporting System. The prevalence of cancer screening for individuals at the recommended age of screening (anal cancer, colorectal cancer, prostate cancer, breast cancer and cervical cancer) and healthy behaviors (sustaining healthy body mass index, smoking, alcohol use and physical activity) was described overall as well as by gender and years since HIV diagnosis (≤ 13 vs. > 13 years). Prevalence across strata was compared using chi-square test.

Results: In the analysis by gender, females were more likely to be obese than males (57% vs. 22%, $p < 0.0001$). Among males, the prevalence of overweight/obesity was significantly higher in those who had been diagnosed with HIV for > 13 years (67% vs. 48%, $p = 0.02$). Among males, 66% reported never having an anal pap-smear, 39% reported never having colonoscopy, and 39% reported never having prostate cancer screening. Among females, 51% reported never having an anal pap-smear, 48% reported never having colonoscopy, 9% reported never having cervical pap smear and 14% reported never having mammograms. The difference in anal pap-smear screening in males and females was statistically significant ($p < 0.0001$). Among males, the prevalence of never having colonoscopy was marginally higher in those who had HIV for ≤ 13 years (51% vs. 31%, $p = 0.05$). Among females, the prevalence of never having mammogram was marginally higher among those who have had HIV for > 13 years (19% vs. 9%, $p = 0.06$).

Conclusion: Prevalence of overweight/obesity differed by biological gender and by years since HIV diagnosis, and the prevalence of never having an anal pap-smear differed by biological gender. Long-term tailored gender-specific interventions can potentially benefit individuals living with HIV for prevention of chronic diseases, including cancer.

134-T

Dietary intake of nutrients involved in folate-mediated one carbon metabolism and risk for endometrial cancer

Michels KA, Lu J, Pfeiffer RM, Trabert B

Purpose Studies disagree as to whether intake of nutrients involved in folate-mediated one-carbon metabolism influences endometrial cancer risk; most research comes from small case-control studies.

Methods We used data from the NIH-AARP Diet and Health Study, a large prospective cohort, and Cox proportional hazards models to evaluate endometrial cancer risk associated with intake of methionine and vitamins B9 (total folate, natural folate, synthetic folate/folic acid), B2, B6, and B12. We also estimated associations by follow-up time (≤ 3 or > 3 years) and by BMI (< 25 or ≥ 25 kg/m²).

Results During 16 years of follow-up, we identified 2,329 endometrial cancer cases among 114,414 participants. Compared to those with the lowest intakes of total folate, women consuming the highest amounts were older, had more years of education, and were less likely to be overweight/obese. Greater consumption of total folate, natural folate, B2, B6, and B12 increased risk for endometrial cancer (hazard ratios [HR] ranging from 1.14 to 1.24 for the highest quintile [Q5] versus the lowest [Q1]). Greater intakes of synthetic folate [Q5 vs. Q1: 1.38 (1.00-1.90)] and B6 [Q5 vs. Q1: 1.72 (1.26- 2.35)] increased risk for endometrial cancer when cancer diagnosis was within 3 years of baseline. Elevated risks associated with natural folate were apparent regardless of time to diagnosis. Increased risks were indicated for the highest intakes of B2, B12, and methionine among women who were overweight/obese, while null risks were suggested among normal/underweight women (p - heterogeneity 0.40, 0.11, and 0.04 respectively).

Conclusions High intakes of several B-vitamins were associated with modestly increased risk for endometrial cancer, especially among women at risk for a cancer precursor, endometrial hyperplasia (i.e., women ≤ 3 years before cancer diagnosis and those who are obese). Future studies are needed to determine if dietary modification reduces cancer risk among women with hyperplasia.

Poster Session Abstracts

135-T

Antibody responses to *Streptococcus gallolyticus* subspecies *gallolyticus* proteins in a large prospective colorectal cancer cohort consortium

Butt J, Blot W, Teras L, Visvanathan K, Marchand L, Chen Y, Bao Y, Sesso HD, Wassertheil-Smoller S, Ho G, Tinker L, Peek R, Potter J, Waterboer T, Epplen M

Purpose: Antibody responses to *Streptococcus gallolyticus* subspecies *gallolyticus* (SGG) proteins, especially pilus protein Gallo2178, have been consistently associated with colorectal cancer (CRC) risk. Previous case-control studies and prospective studies with up to 8 years of follow-up limited the interpretation of SGG infection as a cause or consequence in CRC development. We aimed to analyze a large US CRC cohort consortium with follow-up of up to 40 years for antibody responses to SGG.

Methods: We applied multiplex serology to measure antibody responses to 9 SGG proteins in serum samples of participants in 10 prospective US cohorts (CLUE, CPSII, HPFS, MEC, NHS, NYUWHS, PHS, PLCO, SCCS and WHI) including 4,063 incident CRC cases and 4,063 matched controls. SGG sero-positivity was defined as a median fluorescence intensity (MFI) value above the antigen-specific cut-off and indicates past and/or current infection. Conditional logistic regression was used to assess whether antibody responses to SGG are associated with the risk of developing CRC, overall and by time between blood draw to diagnosis.

Results: CRC risk was increased with antibody responses to Gallo2178 only, albeit not significantly (OR: 1.23; 95% CI: 0.99-1.52). This association became stronger for CRC cases diagnosed less than 10 years after blood draw (OR: 1.40; 95% CI: 1.09-1.79), but not among CRC cases diagnosed more than 10 years after blood draw (OR: 0.79; 95% CI: 0.50-1.24).

Conclusion: In this CRC cohort consortium, we reproduced the association of antibody responses to SGG pilus protein Gallo2178 with risk of developing CRC, but only among those individuals diagnosed within 10 years of their blood draw. These data support the hypothesis of SGG infection as a consequence of tumor development. However, the possibility of SGG also acting as a promotor after initiation of carcinogenesis cannot be excluded.

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Exposure to Organophosphate Flame Retardants and Thyroid Cancer Risk in Women

Deziel NC, Yi H, Stapleton HM, Huang H, Zhao N, Zhang Y

Purpose: Exposure to organophosphate flame retardants (PFRs) occurs worldwide, and growing evidence demonstrates that these chemicals can alter thyroid hormone regulation and function. We investigated the relationship between PFR exposure and thyroid cancer and examined whether individual characteristics or temporal factors predicted PFR exposures.

Methods: Our analysis included 100 incident female, papillary thyroid cancer cases and 100 female controls of a Connecticut-based thyroid cancer case-control study. Interviewer-administered questionnaires and spot urine samples were collected at home visits from 2010-2013. We used mass spectrometry to measure concentrations of six PFR metabolites: 1-hydroxy-2-propyl bis(1-chloro-2-propyl) phosphate (BCIPHIPP), bis(1-chloro-2-propyl) phosphate (BCIPP), diphenyl phosphate (DPPH), bis(1,3-dichloro-2-propyl) phosphate (BDCIPP), isopropyl-phenyl phenyl phosphate (ip-PPP), and tert-butyl phenyl phenyl phosphate (tb-PPP). We used unconditional logistic regression to estimate odds ratios (OR) and 95% confidence intervals (95% CI) for thyroid cancer risk for continuous and categories (low, medium, high) of concentrations of individual and summed metabolites, adjusting for potential confounders. We used multiple linear regression models to examine the relationship between concentrations of PFR metabolites and individual characteristics (age, smoking status, alcohol consumption, body mass index, income, education) and temporal factors (season, year).

Results: None of the individual or summed PFRs were significantly positively associated with risk of papillary thyroid cancer. However, the odds ratios of BDCIPP was elevated; the OR (95%CI) for the high versus low category was 1.78 (95%CI: 0.83-3.8). BCIPP was inversely related to thyroid cancer risk; the OR (95%CI) for the high versus low category was 0.32 (0.20-1.00). Our exposure determinants analysis observed higher urinary PFR concentrations with increasing BMI and in the summer season.

Conclusions: Our results do not support an increased risk of thyroid cancer with exposure to PFRs. However, given the modest sample size and use of spot urine samples to represent long-term exposure, the research question warrants additional study.

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137-T

Exposure to phthalates and its association with body mass index

Diaz Santana MV., Hankinson SE., Sturgeon SR., Bigelow C., Zoeller RT., Manson J., Spiegelman D., Reeves KW.

Phthalates, endocrine-disrupting chemicals used as plasticizers in consumer products, are hypothesized to increase obesity and, as a result, risk of obesity-related cancers. However, findings are not consistent across studies. Identifying whether exposure to phthalates impact obesity is critical for understanding the pathways by which phthalates may affect cancer risk. We performed a cross-sectional analysis of 1,257 women aged 50-79 years selected from the Women's Health Initiative. Urinary levels of thirteen phthalate metabolites (PMs) were measured using high performance liquid chromatography-electrospray ionization-tandem mass spectrometry. Trained study personnel measured participants' weight and height at in-person clinic visits. Body mass index (BMI; weight (kg)/height squared (m²)) was categorized as: under/normal weight (<24.9 kg/m²), overweight (25.0-29.9 kg/m²), and obese (≥30.0 kg/m²). Multinomial logistic regression analysis was used to estimate associations between each PM, categorized in quartiles, and BMI, with adjustment for urinary creatinine, age, race/ethnicity, alcohol use, physical activity, smoking status, healthy eating index, dietary energy intake, hormone replacement therapy, income and education level. Compared to women in the 1st quartile (Q1) of the PM's distribution, those in the 4th quartile (Q4) were more likely to be overweight and obese: e.g., mono-carboxyoctyl phthalate (MCOP; p<0.001; OR 2.8, 95%CI 1.7-4.5 and OR 2.7, 95%CI 1.5-4.7, respectively), mono-2-ethyl-5-hydroxyhexyl phthalate (MEHHP; p<0.05; OR 2.0, 95%CI 1.2-3.4 and OR 2.8, 95%CI 1.6-5.0, respectively), monoisobutyl phthalate (MiBP; p<0.05; OR 2.0, 95%CI 1.2-3.3 and OR 2.1, 95%CI 1.2-3.7, respectively). Mono-hydroxybutyl phthalate (MHBP) was significantly inversely associated with obesity (OR 0.6, 95%CI 0.3-0.9 for Q4 vs Q1). We observed positive associations between several PMs and obesity in this cross-sectional study, which suggests that environmental exposure to PMs may be relevant to the ongoing obesity epidemic. However, we also observed an inverse association with MHBP, underscoring the need to examine each PM independently. Future prospective studies are necessary to deepen our understanding of how phthalates relate to obesity and obesity-related cancers.

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Abstract Withdrawn.

Poster Session Abstracts

139-T

Genome-wide association and inference of clonal mosaicism implicates germline variation as a driver of genome instability

Jakubek YA, Vattathil S, Huff CD, Auer PL, Scheet P

Errors in DNA replication and cell division create daughter cells with chromosomal aberrations that propagate to establish genetically distinct cell populations within an individual. This phenomenon, known as clonal mosaicism, is positively correlated with age and is an important factor in the development of cancer. Blood mosaicism is a strong prognostic marker for hematological cancers. Germline variation is associated with the rare mosaic variegated aneuploidy syndrome. However, the role of less penetrant genetic variants in mosaicism of healthy tissue has not been established. This is due, in part, to critical difficulties in phenotyping. Here we sought to overcome this challenge by conducting a genome-wide association study of clonal mosaicism in samples that were characterized by a haplotype based method to obtain high-fidelity phenotyping of mosaicism. Our analysis included 4 studies from the GENEVA consortium comprised of 9,115 individuals, of which 295 exhibited detectable mosaicism. Meta-analysis following standard imputation-based techniques revealed significant association with mosaicism at two loci, 13q32.2 ($P < 1e-8$, OR = 1.6) and 10p14 ($P < 4.6e-8$, OR = 2.1). Genome-wide significant hits include three intronic FARP1 SNPs and one intronic SFMBT2 SNP. FARP1 gene expression is prognostic in renal cancer. In addition, four loci exhibited suggestive evidence for association ($P < 5e-7$). One of these SNPs is 52kb upstream of XPO1 which regulates nuclear export of RNA and proteins involved in cell cycle regulation, including P53. XPO1 is overactive in many cancers and recent studies suggest that XPO1 inhibitors have anti-tumor activity in patients with hematological malignancies. A second marginally significant hit is 4kb from ADAR1, a gene that is required for normal hematopoiesis and that promotes malignant progenitor reprogramming in chronic myeloid leukemia. In our study, SNPs associated with hematological cancers (GWAS catalog) showed inflated p-values. In summary, we have identified inherited forms of genetic variation that potentially explain the development of detectable clonal mosaicism, an established prognostic factor in hematological malignancy, which may offer insights into the etiology of cancer, early detection and prevention.

140-T

Breast Cancer Incidence and survival in Moroccan women, 2008-2012

Khalis M, Charaka H, El Rhazi K, Chajes V, Charbotel B, Romieu I, Soliman A.

Purpose: The purpose of this study was to describe the latest available incidence and survival rates of breast cancer among Moroccan women, based on results of Casablanca Cancer Registry.

Methods: For this descriptive study, incidence and survival data were derived from the most recent report of the population-based cancer registry of Casablanca (2008 - 2012). This registry covers about 12 % of the Moroccan population.

Results: Breast cancer was the first leading cancer incidence in women, accounting for 35.8% of all new cancer cases in females. The age-standardized rates by Moroccan and world population were 45.5/100 000 women and 49.5/100 000 women, respectively. The highest incidence rates were identified in the age groups of 50-54, 55-59 and 60-64 years (158.6, 197.3 and 154.4 per 100 000 respectively). The Breast cancer survival rates at 5 and 7 years were 79% and 65% respectively.

Conclusions: This study present the most updated data on breast cancer incidence and survival in Moroccan women. It provides useful data for policy makers to plan control strategies of breast cancer in Morocco.

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The role of childhood Epstein Barr Virus and Cytomegalovirus infections and pubertal timing

McDonald JA, Goldberg M, Wei Y, Andrulis I, Buys S, Bradbury A, Daly M, John EM, Santella RM, Terry MB

Purpose: Examine the independent associations between Epstein Barr Virus (EBV) and Cytomegalovirus (CMV) and pubertal timing using the LEGACY Girls Study. Studies suggest that a higher burden of childhood infections are associated with later onset of puberty; however, an alternative hypothesis suggests that microbes are obesogenic and promote earlier onset of puberty.

Methods: LEGACY is a multiethnic cohort of girls recruited at ages 6-13 years, half of whom had a breast cancer family history. Using the subcohort of LEGACY girls who were pre-menarcheal at their first available blood biospecimen (N=498), we measured seropositivity to EBV, CMV, Herpes Simplex Virus 1 (HSV1), and HSV2. We used prospective guardian-reported data on Tanner Stage (TS) for the onset of breast development (TS2-TS5 compared with TS1) and the onset of menarche. We used prospective parametric Weibull survival models to model the association between a given viral exposure and pubertal outcomes. For girls that reached the pubertal event during the study period, we used interval censoring. We adjusted for age at blood draw, body mass index (BMI)-for-age percentile at time of blood draw, race/ethnicity, and maternal education. We also examined whether any of the key exposures and pubertal outcomes varied by time through the addition of interaction terms.

Results: The racial/ethnic composition included 69% non-Hispanic white, 15% Hispanic, 8% Asian American, 6% African American, and 2% of mixed race/ethnicity with a mean (SD) age of 11.3 years (2.4). Seropositivity was 38% EBV (17% EBV+ only), 32% CMV (13% CMV+ only), 14% HSV1, and 0.4% HSV2. CMV-only infection was significantly associated with an earlier age at breast TS2+, but not menarche, in age-adjusted models and associations remained after further adjusting for BMI percentile, race/ethnicity, and maternal education (β -0.05, 95% CI -0.09, -0.01). EBV-only infection was associated with earlier age at breast TS2+ and menarche in age-adjusted models; however, associations were attenuated when further adjusted for BMI percentile.

Conclusion: Viral exposures were common in this contemporary cohort of girls. CMV infection was associated with earlier breast development suggesting that common childhood viruses may impact pubertal timing.

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Inherited Genetic Effects and Risk of Langerhans Cell Histiocytosis Relapse

Peckham-Gregory EC, Chakraborty R, Abhyankar H, McClain KL, Allen CE, Scheurer ME, Lupo PJ

Purpose: Langerhans cell histiocytosis (LCH) is an inflammatory myeloid neoplasia. Approximately 50% of LCH patients relapse, and 40% experience a second relapse event within two years. Sequencing studies have found activating mutations in MAPK pathway genes in ~85% of LCH lesions. Notably, carriers of BRAF-V600E experience a 2-fold increased relapse risk. However, the role of inherited genetic effects in LCH relapse remains unknown. Therefore, we conducted a pilot genome-wide association study to determine the association between inherited genetic variants and LCH relapse risk.

Methods: LCH cases (n=117) were recruited from Texas Children's Hospital, consisting of 52 cases who experienced a relapse event and 65 cases without an event. Genotyping was performed on the Illumina Omni5 Quad BeadChip. We evaluated the role of common variants (minor allele frequency >5%) on LCH relapse using PLINK. We applied a genome-wide threshold of $P < 5.0 \times 10^{-8}$, and threshold of suggestive significance at $P < 1.0 \times 10^{-5}$.

Results: We identified a variant in high linkage disequilibrium with a cluster of loci on Chromosome 9 that surpassed our threshold of suggestive significance (non-coding RNA LOC100506532 rs2182640; $P = 6.98 \times 10^{-6}$). This intronic variant was associated with decreased risk of LCH relapse after adjusting for age at diagnosis, sex, and the top two principal components (adjusted odds ratio: 0.16; 95% confidence interval: 0.07-0.35). While this non-coding RNA gene is largely uncharacterized, non-coding RNAs function to regulate gene expression at the transcriptional and post-transcriptional level.

Conclusion: It is unclear which variant in the LOC100506532 cluster is a potentially causal allele. One of these variants may be a proxy for the causal locus, or may act through an effect on other genes in the same region or at distal sites. Notably RXRA, a retinoic acid receptor, is located in close proximity (~400kb) to LOC100506532 and regulates gene expression in various biologic processes. Risk variants within this gene have been identified in melanoma and colorectal cancers, among other malignancies. While validation of this genomic region in an independent replication set is necessary, our initial results support a role for inherited genetic effects in LCH relapse.

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Antibiotic use and clinical response to immune checkpoint inhibitors in NSCLC

Pierce CM, Nyein A, Gomez M, Zhao Y, Sha S, Maller B, Hogue S, Robinson L, Antonia S

Preclinical studies have demonstrated that broad-spectrum antibiotics (ATB) may modulate the efficacy of immune checkpoint inhibitors (ICI) by disrupting the gut microbiome. However, the impact of ATB in patients with advanced non-small cell lung cancer (NSCLC) remains unclear. Our study assessed the effect of pre-treatment antibiotic use on the clinical response of NSCLC patients treated with ICI. We retrospectively examined medical records of >400 patients. ATB use was assessed from 2 months before and 1 month after 1st ICI injection and patients were categorized as those who received or did not receive antibiotics. The best clinical response recorded within six and 12 months of ICI start was abstracted and patients were categorized as responders (complete [CR] or partial response [PR]) or non-responders (stable [SD] or progressive disease [PD]). To assess the association between antibiotic use and clinical response, Cox proportional hazards regression was used in addition to Kaplan Meier analyses of progression-free (PFS) and overall survival (OS). Included in this analysis were 257 eligible patients treated at Moffitt Cancer Center with anti- PD-1/PD-L1 alone, or in combination with anti-CTLA-4, between 2011 and 2017. Half of all patients were male (53%), a median age of 67 years, and 94% diagnosed with stage IV disease. Pre-treatment antibiotic use was recorded among 47 (18%) patients and 79 (31%) were considered ICI responders. In univariate analyses, antibiotic users were 20% more likely to be a non-responder compared to patients who did not use antibiotics (HR: 1.20 (0.81-1.76)); however, this association was not statistically significant. Median PFS and OS were higher among patients who did not use antibiotics than those who used antibiotics (112 vs. 90 days and 524 vs. 348 days, respectively), although these differences were not statistically significant ($p=0.91$ and $p=0.20$, respectively). To our knowledge, this is the largest study to evaluate the effect of pre-treatment antibiotics on clinical response to ICI among patients with NSCLC. Although not statistically significant, antibiotic use appears to be associated with poorer prognoses among patients with NSCLC. Multivariable analyses will provide additional insight into this association.

144-T

Metabolite Set Enrichment Analysis Reveals Pathways Associated with Minimal Residual Disease and Relapse in Acute Lymphoblastic Leukemia

Schraw JM; Scheurer ME; Rabin KR; Lupo PJ

Purpose: The purpose of this study was to identify alterations in metabolites and metabolic pathways in diagnostic bone marrow plasma which were associated with pediatric acute lymphoblastic leukemia (ALL) minimal residual disease (MRD) and relapse.

Methods: Diagnostic bone marrow plasma from N=100 ALL cases treated at Texas Children's Hospital from 2007- 2015 were sent to Metabolon for global metabolomic profiling by UPLC-MS/MS. Metabolites (N=416) were identified and mapped to the Kyoto Encyclopedia of Genes and Genomes Compound database. Concentrations of each metabolite were re-scaled such that the median was 1. We conducted metabolite set enrichment analysis using IMPaLA to identify metabolic pathways with differential activity in MRD+ vs. MRD- and relapsed vs. non-relapsed patients. The false discovery rate (FDR) was used to account for multiple comparisons.

Results: The sample included 39 MRD+ and 23 relapsed patients. At $FDR < 0.05$, MRD+ patients were distinguished by altered tricarboxylic acid cycle (TCA, $p = 1.9 \times 10^{-6}$) activity as well as increased concentrations of glutathione, spermine, and spermidine at the time of diagnosis ("glutathione metabolism" pathway, $p < 0.005$). Mean concentrations of long-chain and unsaturated fatty acids were decreased among relapsed as compared to non-relapsed patients ($p = 7.6 \times 10^{-6}$). Relapsed patients also demonstrated a trend towards increased concentrations of early, but not late, TCA cycle intermediates (citrate, isocitrate and cis-aconitate, $p = 0.008$), adenosine monophosphate (AMP) and cyclic AMP ($p = 0.001$).

Conclusions: In this assessment, we identified differential activity of key metabolic pathways associated with poor treatment response in ALL. Increased abundances of TCA cycle intermediates were associated with both MRD and relapse. Additionally, increased concentrations of polyamines were associated with MRD whereas decreased concentrations of long-chain fatty acids were associated with relapse. These changes may drive chemoresistance by affecting proliferation and attenuating chemotherapy-induced apoptotic signaling. Metabolomics demonstrates potential utility for early identification of high-risk ALL patients, and for identifying mechanisms of chemoresistance.

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Abstract Withdrawn.

146-T

A molecular epidemiology study of the reactive oxygen species pathway in risk of melanoma

Yuan TA, Yourk V, Farhat AM, Garcia A, Ziogas A, Meyskens FL, Anton-Culver H, Liu-Smith F

Purpose of the study: UV exposure is the primary environmental risk factor for human melanomas yet the underlying mechanism is not fully understood. Recent studies have shown that UV-induced chemiexcitation of melanin derivatives plays a critical role in inducing DNA mutations. This process requires the participation of reactive oxygen species (ROS) which may be produced and enhanced by cellular NADPH oxidase (NOX) complexes. We hypothesized that ROS producing and metabolizing enzymes were the major contributors in UV- driven melanomas.

Method: Using a pathway-driven case-control study that included 170 cases and 152 controls, we genotyped 23 prioritized single nucleotide polymorphisms in NADPH oxidases 1 and 4 (NOX1, NOX4), CYBAp22phox membrane protein, RAC1-GTPase, and ROS metabolizing enzymes superoxide dismutase (SOD) and catalase, to investigate their associations with the risk of melanoma.

Result: We first identified 5 SNPs including rs1049255 (CYBA), rs4673 (CYBA), rs10951982 (RAC1), rs8031 (SOD2), and rs2536512 (SOD3) that exhibited significant genotypic frequency differences between melanoma cases and healthy controls. In simple logistic regression models, RAC1 rs10951982 (OR 8.98, 95% CI: 5.08 to 16.44; $P < 0.001$) reached universal significance after Bonferroni correction ($P = 0.002$); and the minor alleles showed an association with increased risk of melanoma. In contrast, minor alleles in SOD2 rs8031 (OR 0.16, 95% CI: 0.06 to 0.39; $P < 0.001$) and SOD3 rs2536512 (OR 0.08, 95% CI: 0.01 to 0.31; $P = 0.001$) were associated with a reduced risk of melanoma. In multivariate logistic regression models, RAC1 rs10951982 (OR 6.15, 95% CI: 2.98 to 13.41; $P < 0.001$) remained significantly associated with an increased risk of melanoma, adjusting for age, sex, lifetime ever sunburned, and family history of melanoma.

Conclusion: Our result highlighted the importance of RAC1, SOD2 and SOD3 variants in the risk of melanoma. Our next step is to replicate the findings. Once the results are validated, these SNPs may be useful for screening high-risk individuals for a better prevention plan in melanoma.

Poster Session Abstracts

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Body composition changes after diagnosis and survival of patients with advanced pancreatic cancer

Babic A, Rosenthal MH, Danai LV, Morales-Oyarvide V, Khalaf N, Brais LK, Welch MW, Zellers C, Vander Heiden MG, Clish C, Wolpin BM

Body composition changes resulting in loss of muscle tissue (sarcopenia) and weight loss are a hallmark of pancreatic cancer. Although they result in reduced quality of life, their association with patient survival is not well understood. We evaluated whether post-diagnosis change in muscle and adipose tissue correlates with patient survival. Furthermore, we have previously shown that breakdown of muscle tissue occurring early in the disease results in increased plasma levels of branched-chain amino acids (BCAA). Here we investigate whether BCAA levels at diagnosis are associated with subsequent loss of muscle tissue. Muscle, visceral and subcutaneous adipose tissue areas were measured using computed tomography (CT) imaging. Measurements were performed on baseline CT scans and on follow-up CT scans, obtained 50-120 days later, in 89 pancreatic cancer patients with locally advanced and metastatic disease. Association between body composition change and survival was evaluated using multivariate Cox proportional hazards model. Between the diagnostic and the follow-up scan, patients lost on average $11.4 \pm 12.3\%$ of muscle area, $17.0 \pm 21.6\%$ of subcutaneous fat, and $7.1 \pm 76.5\%$ of visceral fat. Compared to patients in top quartile of muscle area change (average gain of $0.2 \pm 2.9 \text{ cm}^2$), those in the lowest quartile (average loss of $13.2 \pm 4.4 \text{ cm}^2$) had a 3.3-fold increase in mortality (HR=3.29, 95% CI: 1.26-8.85). We observed a 2.9-fold increase in mortality among patients in the bottom quartile of visceral fat change (average loss of $29.0 \pm 14.9 \text{ cm}^2$), compared to those in the top quartile (average gain of $7.2 \pm 9.9 \text{ cm}^2$) (HR=2.93, 95% CI: 1.25-6.86). There was no association between loss of subcutaneous fat and patient survival. Compared to patients in the lowest tertile of total BCAA levels, those in the highest tertile lost more muscle (P=0.004). In conclusion, greater post-diagnosis loss of muscle and visceral fat area was associated with large reduction in patient survival. Plasma levels of BCAA could potentially serve as a biomarker for identifying patients at risk of developing greater loss of muscle area. Our findings warrant further studies in larger populations of pancreatic cancer patients.

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Cancer-Related Symptoms and Cognitive Intervention Adherence Among Breast Cancer Survivors: A Mixed Methods Study

Bail J, Ivankova N, Heaton K, Vance DE, Triebel K, Meneses K

Purpose: To explore the relationship between selected cancer-related symptoms and adherence to the Speed of Processing in Middle Aged and Older Breast Cancer Survivors (SOAR) cognitive training intervention among breast cancer survivors (BCS) residing in Alabama by using a sequential quantitative (Quan), qualitative (Qual) mixed methods design consisting of two distinct phases.

Methods: The first (Quan) phase examined the relationship between selected cancer-related symptoms and adherence to SOAR among BCS (n = 30) through self-reported questionnaire data. The second (Qual) phase explored potential facilitators and/or barriers to SOAR and identified how symptoms contributed to/explained differences in adherence by conducting semistructured interviews with 15 purposefully selected phase I participants. Data were analyzed using R Studio (Quan) and NVivo® (Qual) software.

Results: Spearman's rho correlation suggested relationships between adherence and perceived cognitive impairment, depressive symptoms, and sleep quality. Inductive thematic analysis yielded four themes that described how cancer-related symptoms are related to adherence to SOAR among BCS, differences between adherent and non-adherent participants, and cultural aspects: 1) experiences of cancer-related symptoms; 2) influences of cognitive training; 3) adherence to cognitive training; and 4) environment for cognitive training. Integration of the Quan and Qual findings revealed that response to awareness of perceived cognitive impairment is critical to cognitive training adherence and that cognitive training exacerbates depressive symptoms among some BCS. Moreover, poor sleep quality can aggravate cognition and mood and negatively influence cognitive training motivation and performance, creating a snowball effect. Yet, continued cognitive training may improve sleep, mood, and cognition among BCS.

Conclusions: Experiences of and responses to cognitive training and cancer-related symptoms shape adherence to cognitive training among BCS. BCS experiencing concurrent cancer-related symptoms may be mentally and/or physically unable to attend to cognitive training. Future cognitive studies among BCS may consider applying a comprehensive approach aimed at addressing concurrent cancer-related symptoms.

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Lung Cancer Survival in SEER patients under 65 by Insurance Status

Bittoni MA, Fisher James L

Introduction/Purpose: Lung cancer is the leading cause of new cancers and cancer deaths in the United States. Past SEER reports have shown an increased incidence of lung cancer in individuals at younger ages. Disparities and access to care are a prime cause of concern among those not yet eligible for Medicare, which automatically covers individuals >65 years. The purpose of this report is to examine the relationship between lung cancer survival in individuals <65 years of age and factors related to access to care, such as insurance type, socioeconomic status, residence and demographic/clinical factors.

Methods: Data were obtained from the SEER Database provided by the National Cancer Institute, which consists of 18 population-based, central cancer registries. Lung/bronchus cancer diagnoses from 2017-2013 were classified by SEER using the ICD 10 codes, 34.0-34.9. The following factors were also collected from the SEER database: year of diagnosis, age, sex, race, ethnicity, insurance, marital status, stage at diagnosis, histology, rural-urban residence and median income. Cox proportional hazards regressions models were used to estimate hazard ratios (HR) and assess whether insurance and potential confounders were associated with lung cancer survival.

Results: A total of 112,400 individuals <65 years with lung cancer were identified for this analysis. Over half were male (54%) and 78% were white with a mean age of 56 years. Regarding insurance status, 28% of individuals reported having Medicaid insurance, 68% reported having other unspecified insurance, and 8% were uninsured. Cox proportional hazard regression models revealed no significant difference between those with Medicaid versus the uninsured, but an increased probability of survival for those with other insurance compared to the uninsured, adjusting for covariates (HR=0.86, P<0.0001; P-trend<0.0001). White versus Black race also showed an increased probability of survival adjusting for other factors (HR=0.90, P<0.001).

Conclusion: Prognosis for uninsured individuals diagnosed with lung and bronchus cancer <65 years of age was worse than for those with insurance, even after adjustment for important factors such as stage at diagnosis, race and factors summarizing area- based socioeconomic status.

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Statin use and risks of colon cancer recurrence and second cancer events

Bowles E, Yu O, Ziebell R, Chen L, Boudreau D, Ritzwoller D, Hubbard R, Boggs J, Burnett-Hartman A, Sterrett A, Fujii M, Chubak J

Purpose: To evaluate the association between statin use and colon cancer recurrence in a large, population-based study.

Methods: We conducted a retrospective cohort study of adults with stage I-IIIa colon cancer diagnosed between 1995-2014 in Kaiser Permanente (KP) Colorado or KP Washington. All cases had surgical treatment and were cancer-free (based on imaging results) for at least 90 days after their final day of treatment (date of complete surgery, last chemotherapy, or last radiation therapy). Statin prescriptions were obtained from pharmacy dispensing and claims data; people were considered a user on the date of their first fill after cancer diagnosis and remained in this category through the end of follow-up. We abstracted information from medical records and tumor registries on colon cancer recurrences and second primary cancers at all anatomic sites. We followed subjects until death, health plan disenrollment, or through the date of chart abstraction. Using Cox proportional hazards models, we estimated hazard ratios (HRs) with 95% confidence intervals (CIs) for 1) colon cancer recurrence, and 2) second cancer events (recurrences and second primaries at any anatomic site) comparing statin-users to non-users. HRs were adjusted for age, year of diagnosis, sex, study site, stage, race, smoking status, body mass index, Charlson comorbidity score, and statin use in the year before diagnosis.

Results: Among 2,040 people with a mean age at diagnosis of 70 years, 937 (45.9%) used statins after diagnosis. Compared to non-users, a greater proportion of statin users were male (53%), ever smokers (59%), and had more comorbidities at diagnosis (29% with Charlson score >2). After a median follow-up of 4.9 years, 452 had a second cancer event, including 152 with a colon cancer recurrence. The crude recurrence rates were 10.4 (95%CI 7.7- 13.7) per 1,000 person-years among statin users and 14.3 (95%CI 11.6- 17.3) per 1,000 person-years among non-users. In multivariable models, statin use was not associated with recurrence (HR=1.05, 95%CI=0.63- 1.75) but was associated with a reduced risk of any second cancer event (HR=0.65, 95%CI=0.51-0.83).

Conclusions: Statin use may reduce the risk of second cancer events, but not by reducing the risk of colon cancer recurrence.

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The HEROIC Registry: Opportunities for Collaboration

Burton-Chase AM, Dubin R, Dubin D

Background: AliveAndKickn, whose mission is to improve the lives of individuals and families affected by Lynch Syndrome through research, education, and screening, recently introduced the HEROIC Registry. It is the first-of-its-kind patient-centric genetic database that will enable patients to take an active role in furthering Lynch syndrome research.

Methods: The HEROIC Registry allows patients to contribute medical information and their experiences living with Lynch Syndrome and its associated cancers to help researchers develop new treatments, understand the various genetic mutations, write research articles, and conduct further studies and clinical trials. Ultimately, the goal of the Registry is to have aggregate data from thousands of individuals.

Results: The HEROIC Registry was launched in February of 2016. Potential participants were notified about the availability of the Registry via the AliveAndKickn website, email announcements, social media promotions, conferences and awareness events, and AliveAndKickn's clinical and institutional partners were offered the opportunity to contribute their health information. As of November 2017, 149 individuals have added their data to the Registry. Of those, 128 have a known Lynch syndrome mutation and were on average 42 years old at the time of diagnosis. 34.2% report having had a diagnosis of colorectal cancer with an average age of 42 at diagnosis; 20.6% of female respondents report having had endometrial cancer with an average age of 46 at diagnosis. 32.8% are cancer-unaffected. Additional data in the Registry include screening and surveillance behaviors, family history, and interest in participating in future research studies.

Conclusions: The HEROIC Registry provides a unique opportunity for health care providers and researchers to partner directly with a patient-advocacy organization for the purposes of improving patient care in this population. It also has the benefit of including a diverse set of patients who are being seen in a variety of health care settings, which can aid in exploring research questions outside of a single institution.

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Colorectal cancer screening practices among cancer survivors in Pennsylvania, 2017.

Calo WA, Foo W, Bluethmann SM, Mama SK, Winkels R, Wiskemann J, Segel J, Lengerich EJ, Schmitz KH

Purpose: Cancer survivors are at increased risk for developing second or new cancers than cancer-free individuals. We examined colorectal cancer screening (CRCS) practices among cancer survivors in Pennsylvania (PA); a state home to over 700,000 cancer survivors, the fifth largest cancer survivor population in the US.

Methods: We analyzed cross-sectional data from 402 cancer survivors aged 50–75 years who reside in central PA. Survivors were identified using the PA Cancer Registry and were mailed a survey using Behavioral Risk Factor Surveillance Survey-based items from May–September, 2017. We classified respondents as adherent to CRCS if they met the U.S. Preventive Services Task Force screening guidelines: having a FOBT in the previous 12 months, a flexible sigmoidoscopy in the previous 5 years, or a colonoscopy in the previous 10 years. Analyses used multivariable logistic regression to assess correlates of CRCS practices.

Results: Overall, 80% of the sample was up-to-date to any recommended CRCS test. Compared to colorectal cancer survivors (95%), screening rates were significantly lower ($p < .05$) among respondents with a primary diagnosis of gynecologic (80%), breast (73%) or lung (60%) cancer. CRCS rates were higher among survivors with a household income of \$35,000–\$74,999 (versus $< \$35,000$: odds ratio [OR]=2.27; 95% CI, 1.06–4.87) and lower among survivors without health care insurance (versus insured: OR=0.29; 95% CI, 0.10–0.91) and those with self-rated fair/poor health (versus excellent/very good: OR=0.27; 95% CI, 0.12–0.60).

Conclusion: Many cancer survivors in PA have received up-to-date CRCS. Despite this, the proportion of survivors obtaining CRCS varies considerably by primary cancer diagnosis, household income, health insurance coverage, and health status. Narrowing these differences is essential to lessen disparities.

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Perceived Symptom Related Barriers and Associated Quality of Life in Head and Neck Cancer Survivors

Douglas KG, Crowder SL, Fruge AD, Delk A, Chen YT, Carrol WR, Spencer SA, Locher JL, Demark-Wahnefried W, Rogers LQ, Arthur AE

Purpose: The objective of this research was to examine associations between perceived symptom-related barriers to eating and quality of life (QOL) in post-treatment head and neck cancer (HNC) survivors who participated in a dietary intervention trial.

Methods: This was an exploratory analysis of 23 post-treatment HNC survivors who had previously participated in a 12-week randomized dietary intervention trial to assess the feasibility of increasing cruciferous (CV) and green leafy vegetable (GLV) intake. For this analysis, both treatment groups were combined into one. Participants completed a pre-intervention survey that assessed HNC-specific QOL (FACT-HN) and ranked self-perceived symptom-related barriers to eating on a 5-point Likert scale (1 = "never" to 5 = "very often"). A summary score for all symptom-related barriers was computed (maximum of 80 points) and Pearson correlations between the summary score and QOL were examined. Pearson correlations were also examined between scores for individual symptom-related barriers and QOL.

Results: A lower symptom-related barrier summary score was significantly correlated with improved physical, emotional, and functional QOL ($p < 0.01$ for all). Lower individual symptom-related barrier scores for dry mouth, food does not taste good, feeling full too quickly, choking, phlegm production in mouth, difficulty swallowing, and lack of appetite were significantly associated with improved physical QOL ($p < 0.05$ for all). Symptom-related barrier summary score was not correlated with overall QOL.

Conclusions: In this analysis of post-treatment HNC survivors, the degree of perceived symptom related barriers was associated with reduced QOL in several domains. Many individual perceived symptom related barriers were positively correlated with the physical domain of QOL. Although this was a small and exploratory secondary data analysis, these results suggest that perceived symptom related barriers and reduced QOL may be unmet needs in this survivor population and a larger study is warranted.

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A Mindfulness-based Cancer Recovery Program for African American Survivors of Lung Cancer and their Family Members (Dyads): A Feasibility Study

Gallerani DG, Myhren-Bennett A, Newsome BR, McDonnell KK

Background: Although the five-year survival rate for individuals with non-small cell lung cancer (NSCLC) is increasing, excessive symptom burden remains a common problem. This study aims to test an intervention, "Breathe Easier", which encompasses meditation, sitting yoga, and breathing exercises for survivors with NSCLC (stages I-IIIa) and family members designed primarily to reduce dyspnea, fatigue, and stress.

Methods: Using cancer registry data, participants were recruited from an American College of Surgeons approved cancer program in South Carolina. A close friend or family member was required for participation (dyads). Using a 2-month prospective, one-group repeated measures design, this study evaluated recruitment, retention, intervention dosage, adherence, and acceptability. Intervention dosage was measured using a written protocol. Attendance and completion of daily assignments measured adherence. Acceptability was assessed at three data collection points. Descriptive statistics characterized the participants and their responses.

Results: In the first of three planned iterations, a total of 161 survivors were invited, 36 (22%) responded or were reached with 6 dyads (12 participants; 17% recruitment rate) enrolled. "Family members" were spouses, daughters, friends, and pastors. A 100% retention rate was achieved; 6 participants with 100% attendance, 3 with 89%, and 3 with 78%. Family members had slightly greater adherence (75%; range 10-49 daily assignments) than survivors (65%; range 5-48 daily assignments). All agreed that course materials were easy to read and use, learning yoga helped them, and that involving a family member was important to them.

Conclusions: Recruitment was low (17%), yet not surprising given the isolating nature of lung cancer, the uniqueness of this type of intervention, and the dyadic requirement. However, the 100% retention rate and acceptability data shows that survivors and their "family members" were engaged. These preliminary findings call for broader recruitment strategies and are limited by the one group design and sample size. The study offers insight into the feasibility related to a mindfulness-based intervention with this unique subset of survivors and family members. These results will enhance ongoing testing.

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Rural-Urban Differences in Health Outcomes among Older, Overweight, Long-Term Cancer Survivors

Gray MS, Judd SE, Sloane R, Snyder DC, Miller PE, Demark-Wahnefried W

Background: Rural cancer survivors are at increased risk for poorer health outcomes, cancer-related mortality, lower physical functioning and face multiple challenges—limited transportation, education, income, and healthcare access, and older age. Yet, there is little research in rural cancer survivors. The Reach Out to ENhance Wellness (RENEW) trial was a home-based, diet and exercise intervention among 641 older, breast, prostate, and colorectal cancer survivors that addressed many of these challenges.

Methods: Via unadjusted and adjusted (covariates: age, race, sex, education, comorbidity and symptom count, baseline physical function, intervention/waitlist intervention group, and years since diagnosis) analyses, we examined urban-rural differences among RENEW participants in physical functioning, overall physical and mental quality-of-life, intakes of fruits and vegetables (FV) and saturated fat, body mass index (BMI), physical activity, and adverse events (total and serious).

Results: Rural, as compared to urban survivors, reported significantly better changes in physical functioning in unadjusted and adjusted comparisons (p -values <0.005); moreover, adjusted models suggest better response for overall physical health [$+0.14(0.71)$ v $-0.74(0.50)$], and fewer mean(SD) adverse events [$1.58(0.08)$ v $1.64(0.06)$], but less favorable changes in FV intake [$+1.47(0.23)$ v $+1.56(0.16)$] (all p -values <0.04). No rural-urban differences were detected in mental quality-of-life, saturated fat intake, BMI, physical activity, and serious adverse events.

Conclusion: The RENEW intervention was associated with greater benefit in rural versus urban cancer survivors and serves as an exemplar to reduce declines in physical health and functioning in this vulnerable population; however, more research is needed among rural cancer survivors to overcome barriers to FV consumption.

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Selecting active surveillance: decision-making factors for men with a low-risk prostate cancer

Hoffman, RM; Lobo T; Van Den Eeden SK; Luta G; Davis KM; Aaronson D; Taylor KL

Men with a low-risk prostate cancer (PCa) can opt for active surveillance (AS), a monitoring strategy deferring active treatment (AT) in the absence of disease progression. AS can minimize the harms of overtreatment, but historically most eligible men select AT. We evaluated factors associated with selecting AS. We enrolled 1139 men from Kaiser Permanente Northern California (KPNC) with a low-risk PCa (PSA < 10 ng/mL, Gleason < 7 , stage $\leq 2a$) diagnosed between 2012-14. We conducted telephone surveys within 30 days of diagnosis, collecting data on socio-demographics and clinical history, PCa knowledge, and psychological and decisional factors. We abstracted medical record data on comorbidities and tumor characteristics. We classified men as selecting AS if they remained continually enrolled in KPNC and did not undergo active treatment (surgery, radiotherapy, or hormone therapy) within a year of diagnosis. We used multivariable logistic regression analyses to identify factors associated with selecting AS. We evaluated 1118 subjects, median age 62, 81% white, 19% $<$ college education; 637 (57%) opted for AS. Significant predictors for selecting AS were increasing age (70+ vs < 50 , OR = 4.7; 95% CI 1.8-12.6), being aware of low-risk status (1.7; 1.0-3.0), knowing that AS was an option (3.6; 1.6-8.1), wanting to avoid sexual dysfunction (1.5; 1.0-2.1) and radiation exposure (2.4; 1.6-3.6), and a urologist recommendation for AS (6.3; 3.9-10.3). Conversely, wanting to be cured of cancer (2.2; 1.3-3.9), greater anxiety (1.5; 1.1-2.1), greater decision confidence (2.2; 1.5-3.1), and having higher PSA levels (1.2; 1.0-1.3), clinical stage (2.2; 1.2-4.1), and percent positive biopsy cores ($>25\%$ vs. $<10\%$, 4.3; 2.8-6.7) were associated with AT. A substantial proportion of subjects selected AT and decisions were associated with tumor characteristics, demographics, comorbidity, and personal values. Men selecting AS were more knowledgeable about PCa prognosis and treatment options. Although supported by urologists in selecting AS, these men were less confident in their decision than those selecting AT. Efforts to provide comprehensive early decision support to men with low-risk cancers may facilitate better informed decision making and potentially increase AS uptake.

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Definitive treatment and risk of death among men diagnosed with metastatic prostate cancer at the Veterans Health Administration

Khan S, Hicks V, Drake BF

PURPOSE: Traditional treatments for men with metastatic prostate cancer include hormone therapy or chemotherapy; here we investigate the potential survival benefit associated with receipt of definitive treatment (i.e. radical prostatectomy or radiation) in men with metastatic prostate cancer.

METHODS: Our cohort consisted with 3926 men that received treatment for metastatic prostate cancer at the Veteran's Health Administration between 1997 and 2009. Metastatic disease was defined as cancer that had spread regionally (T4), metastasized to the lymph nodes (N1), or metastasized distantly (M1). Definitive treatment was defined as primary treatment with radical prostatectomy or radiation and determined using VA medical records. Cox proportional hazards models were used to assess the association between receipt of definitive treatment and (1) prostate cancer-specific death and (2) all-cause death. Multivariable models were adjusted for age, race, PSA, locale (rural vs. urban), and prostate cancer grade at diagnosis. In a sensitivity analysis, we used a more restrictive definition of metastatic prostate cancer (T4 or M1 only).

RESULTS: 38.9% of the cohort received definitive treatment. Men were least likely to receive definitive treatment if they were diagnosed after 70 years of age, had grade 4 prostate cancer, or a PSA > 20 ng/ml at diagnosis. During follow-up there were 1106 prostate cancer-specific and 1754 all-cause deaths with a mean survival time of 7.6 and 6.0 years, respectively. Receipt of definitive treatment was associated with a reduced risk of prostate cancer death in both models adjusted for grade (HR: 0.27; 95% CI: 0.23, 0.31) and fully adjusted models (HR: 0.37; 95% CI: 0.31, 0.44). Definitive treatment was also associated with a reduced risk of all-cause death [grade-adjusted (HR: 0.35; 95% CI: 0.31, 0.39), fully-adjusted (HR: 0.47; 95% CI: 0.42, 0.53)]. In a sensitivity analysis using a more restrictive definition of metastatic disease (T4 or M1), definitive treatment remained associated with a reduced risk of prostate-cancer specific (HR: 0.48; 95% CI: 0.39, 0.59) and all-cause (HR: 0.59; 95% CI: 0.51, 0.68) death in fully adjusted models.

CONCLUSION: Definitive treatment may improve survival in men with metastatic prostate cancer.

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Body Compositions and Menopausal Status in Early-stage Breast Cancer Survivors

Lee K, Sami N and Dieli-Conwright CM

The menopause transition is associated with changes in lean mass (LM) and body fat distribution such that postmenopausal (Post-M) women experience a greater increase in fat mass (FM) and a greater loss of LM, compared to premenopausal women (Pre-M). In particular, breast cancer survivors (BCS) are susceptible to negative alterations in body composition due to premature treatment-induced menopause and other cancer-related treatments. However, it is unclear as to whether Pre-M and Post-M BCS have different body composition profiles following the completion of cancer treatments. The purpose of this study is to investigate whether body composition, including LM, body fat percentage (BFP), FM, differs among Pre-M and Post-M BCS. Sedentary BCS (stage I-III) who completed cancer treatment within the previous 6 months were recruited from the University of Southern California and Los Angeles County Medical Center as part of a larger ongoing clinical trial. All participants underwent a whole body dual energy X-ray absorptiometry (DXA) scan to measure LM, BFP, and FM in a temperature-controlled room, after a 4-hour fast and abstinence from alcohol, caffeine, and vitamins. Independent sample t-tests were used to compare LM, BFP and FM between Pre-M and Post-M BCS. Our study sample include 89, primarily Hispanic (64%) BCS including 37 Pre-M and 52 Post-M women. BCS were diagnosed with stage I (37%) or II (32%) breast cancer with a mean age of 52.7 ± 10.4 years and mean BMI of 29.2 ± 5.6 kg/m². There was no significant difference between Pre-M and Post-M BCS in assessments of LM (Pre-M: 37.9 ± 10.4 kg, Post-M: 39.7 ± 5.2 kg; $P=0.34$), BFP (Pre-M: 44.27%, Post-M: 44.22%; $P=0.97$) and FM (Pre-M: 32.2 ± 12.2 kg, Post-M: 32.5 ± 10.2 kg; $P=0.97$). Body composition is similar among sedentary Pre-M and Post-M BCS. Menopausal status may not affect body composition profiles in BCS as it does in women free from a history of cancer. Future investigations are warranted to characterize body composition profiles across the cancer survivorship continuum.

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Association between concomitant hydrochlorothiazide use and neutropenia-related hospitalizations among older breast and colon cancer patients treated with chemotherapy

Lund JL, Hinton SP, Hsu C, Stürmer T, Reeder-Hayes KE, Sanoff HK

Limited evidence suggests that use of hydrochlorothiazide (HCTZ), a blood pressure medication, concomitant with 5-fluorouracil (5FU) or cyclophosphamide increases myelosuppression. Using cancer registry and claims data, we investigated the association between concomitant HCTZ use and neutropenia-related hospitalizations among cyclophosphamide-treated breast and 5FU-treated colon cancer patients. Adults with a first primary stage I-III breast or II-III colon cancer over age 65 and initiating adjuvant chemotherapy with cyclophosphamide or 5FU were identified using the Surveillance, Epidemiology, and End Results-Medicare data. Concomitant HCTZ use was defined as any overlap between HCTZ days' supply and initiation of chemotherapy. Neutropenia-related hospitalizations within 6-months were identified using primary and secondary diagnosis codes. Potential confounders included age, sex, race, stage, other chemotherapies (anthracyclines, taxanes, oxaliplatin), Charlson comorbidity score, predicted frailty, and polypharmacy. Cox proportional hazards models were used to estimate unadjusted and adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs) for HCTZ use and neutropenia-related hospitalization. We identified 2,045 breast and 2,079 colon cancer patients who initiated adjuvant chemotherapy containing cyclophosphamide or 5FU, respectively. In addition to cyclophosphamide, 40% and 60% of breast patients were treated with an anthracycline or taxane, respectively. In addition to 5FU, 56% of colon patients were treated with oxaliplatin. Overall, 27% of breast and 17% of colon cancer patients were exposed to HCTZ and 11% and 4% were hospitalized for neutropenia within 6 months. In the breast cohort, there was no association between HCTZ use and neutropenia-related hospitalization before (HR=0.98, 95% CI: 0.73, 1.31) or after adjustment (aHR=0.97, 95% CI: 0.73, 1.30). Results were similar in the colon cohort (HR=1.04, 95% CI: 0.61, 1.78; aHR=1.06, 95% CI: 0.61, 1.84). Neutropenia-related hospitalizations were more common among breast than colon cancer patients. Despite being listed as a potential drug-drug interaction in pharmacy reference databases, we found no evidence for an increased risk of neutropenia-related hospitalizations associated with HCTZ use.

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Randomized Controlled Trial of a Dyadic Yoga Intervention for Patients with Brain Tumors and their Family Caregivers

Milbury K; Mallaiah S; Mahajan A; Armstrong T; Li L; Cohen L

Although the mean time of survival for patients with brain tumors is between 2-7 years, little is known about effective behavioral intervention to manage the quality of life (QOL) of this understudied patient population. Also, despite the high physical and psychological burden among family caregivers, the needs of caregivers generally remain unaddressed. Thus, we aimed to establish the feasibility and preliminary efficacy of a Dyadic Yoga (DY) intervention integrating gentle exercise with relaxation techniques to address physical and psychological symptoms. Adults with glioma undergoing at least 5 weeks of radiotherapy (RT) and their family caregivers were included. Dyads were randomized to a 12-session DY program or a waitlist control (WLC) group. Patients and caregivers in both groups completed measures of depressive symptoms (CES-D), cancer-related symptoms (MDASI) and overall QOL (SF-36) at baseline and post-DY, which was at the end of RT. We approached 36 dyads of which 21 (58%) consented. One dyad withdrew prior to randomization. Patients (mean age: 46 yrs., 58% male, 68% KPS=90) and caregivers (mean age: 51 yrs., 68% female, 50% spouses) completed a mean of 11.67 sessions. All of them completed baseline and follow-up assessments. We examined differences scores separately for patients and caregivers for each outcome using ANCOVA controlling for participants' age, sex, and patient KPS. The yoga group revealed marginally significant reductions in depressive symptoms in patients ($p < .09$; means, DY=-7.73 vs WLC= -1.17; $d = .64$) and caregivers ($p < .09$; means, DY=-5.06 vs WLC=2.56, $d = .86$) and patients' cancer-related symptoms ($p < .09$, means, DY=-1.60 vs WLC=-.26, $d = .69$) relative to the WLC group. We also found clinically significant improvements in the mental component summary of the SF-36 for patients (means, DY=-6.54 vs WLC= 1.62; $d = .35$) and caregivers (means, DY=2.87 vs. WLC= -2.36; $d = .35$) in the DY group relative to the WLC group. All participants in the DY group indicated that they perceived benefit from the program and found it useful. As the DY program appears to be feasible and beneficial to patients and caregivers regarding self-reported QOL outcomes with medium and large effects, a larger trial with a more stringent control group is warranted.

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Interim Results of a Tiered Patient Recall/Reminder Program for Human Papillomavirus Vaccination in a Safety Net Healthcare System in Houston, Texas

Montealegre JR, McGee L, Daheri M, Sangi-Haghpeykar H, Mallory-McRae M, Hanser L, Klein K, Anderson ML, Boom J, Scheurer ME, Jiba-ja-Weiss ML

Purpose: We are implementing a tiered patient tracking, reminder/recall, and navigation program as part of multicomponent intervention to improve HPV vaccine initiation and completion rates in a large, urban safety net healthcare system. Here we present interim results from Year 1 of the program.

Methods: The tiered intervention involves creating and managing a registry of age-eligible pediatric patients (age 11-18 years). Patients' vaccination status is categorized as unvaccinated, partial (1 dose), or complete (2 or 3 doses, according to age-specific guidelines). Patients are group-randomized to the intervention or control group based on the clinic where they were last seen. Patients from intervention group clinics (n=12) are prospectively tracked and their parents/caregivers receive reminder/recalls for doses 2 and 3, as well as assistance making appointments and addressing individual-level barriers. Patients in control group clinics (n=11) are prospectively tracked. Here we compare vaccine completion status among patients in the intervention versus control groups, overall and by age (11-12 versus 13-18 years) and race/ethnicity.

Results: There were a total of 7,115 patients in the intervention and 7,475 in the control group. Overall vaccine series completion was significantly higher in the intervention versus control group (57.6% versus 44.2%, $p<0.001$). Higher completion rates were observed in the intervention versus control group across both age categories: 49.2% versus 25.5% among 11-12 year-olds ($p<0.001$) and 60.1% versus 50.4% among 13-18 year-olds ($p<0.001$). Similarly, higher completion rates were observed in the intervention group among patients of all races/ethnicities: 60.9% versus 47.6% among Hispanics ($p<0.001$), 46.4% versus 28.8% among non-Hispanic blacks ($p<0.001$), 43.2% versus 23.3% among non-Hispanic whites ($p<0.001$), and 42.4% versus 21.4% among those of other races/ethnicities.

Discussion: After one year of implementation, HPV vaccine completion rates were approximately 13% higher among patients in the intervention versus control group. These data suggest that tiered patient tracking, reminder/recall, and navigation is highly effective at increasing HPV vaccine completion rates in a safety net healthcare system.

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A Prospective Study of Cancer Survivors and Risk of Sepsis Within the REGARDS Cohort

Moore JX, Akinyemiju T, Bartolucci A, Wang HE, Waterbor J, and Griffin R

INTRODUCTION: The aims of this study were to compare the risk of sepsis between cancer survivors and no cancer history participants and whether these differences were modified by race.

METHODS: We performed a prospective analysis of data from the REasons for Geographic and Racial Differences in Stroke (REGARDS) cohort. We categorized participants as "cancer survivors" or "no cancer history" derived from self-reported responses of being diagnosed with any cancer, excluding non-melanoma skin cancer. We defined sepsis as hospitalization for a serious infection with ≥ 2 systemic inflammatory response syndrome criteria. We performed Cox proportional hazard models to examine the risk of sepsis after cancer, and stratified by race. In a secondary analysis, we used the Fine & Gray model to examine all-cause mortality as a potential competing risk for sepsis events. We sequentially adjusted our models for 1) sociodemographics, 2) health behaviors, and 3) chronic medical conditions, biomarkers, and baseline medication use.

RESULTS: Among 29,693 eligible participants, 2959 (9.97%) were cancer survivors, and 26,734 (90.03%) were no cancer history participants. Cancer survivors were older, more likely to be male, have White race, lower income, past tobacco use, and have a greater number of comorbidities. Among 1393 sepsis events, the risk of sepsis was higher for cancer survivors (adjusted HR: 2.61, 95% CI: 2.29 – 2.98) when compared to no cancer history participants. Risk of sepsis after cancer survivorship was similar for both Blacks (adjusted HR: 3.10, 95% CI: 2.42 – 3.97), and White participants (adjusted HR: 2.45, 95% CI: 2.10 – 2.86) (p value for race and cancer interaction = 0.63).

CONCLUSION: In this prospective cohort of community dwelling adults, regardless of race and after controlling for sociodemographic, health behaviors, and comorbidity characteristics, we observed that cancer survivors had more than a 2.5-fold increased risk of sepsis.

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Polypharmacy and patterns of prescription medication use among cancer survivors

Murphy CC, Fullington HM, Alvarez CA, Lee SJC, Betts AC, Haggstrom DA, Halm EA

Background: The population of cancer survivors is rapidly growing in the U.S. Long-term and late effects of cancer, combined with ongoing management of other chronic conditions, make survivors particularly vulnerable to polypharmacy and its adverse effects. We examined patterns of prescription medication use and polypharmacy in a population-based sample of cancer survivors and adults without cancer.

Methods: Using data from the Medical Expenditures Panel Survey (MEPS), we matched cancer survivors (n=5,216) to non-cancer controls (n=19,588) by age, sex, and survey year. We defined polypharmacy as using five or more unique medications. We examined the proportion of respondents prescribed specific medications within first-, second-, and third-level therapeutic classes and compared these proportions by time since diagnosis. We also estimated total annual expenditures from prescription medications, including both out-of-pocket payments and payments made by insurance.

Results: A higher proportion of cancer survivors were prescribed five or more unique medications (64.0%, 95% CI 62.3 – 65.8%) compared to non-cancer controls (51.5%, 95% CI 50.4 – 52.6%), including drugs with abuse potential. Across all therapeutic classes, a higher proportion of newly (≤ 1 year since diagnosis) and previously (> 1 year since diagnosis) diagnosed survivors were prescribed medications compared to controls, with large differences in central nervous system agents (65.8% vs. 57.4% vs. 46.2%), psychotherapeutic agents (25.4% vs. 26.8% vs. 18.3%), cardiovascular agents (62.2% vs. 59.1% vs. 52.4%), and gastrointestinal agents (31.9% vs. 29.6% vs. 22.0%). Specifically, nearly 10% of survivors were prescribed benzodiazepines and/or opioids compared to about 5% of controls. Survivors also had more than double prescription expenditures (median \$1,633 vs. \$784 among non-cancer controls). These findings persisted similarly across categories of age and comorbidity.

Conclusion: Cancer survivors were prescribed a higher number of unique medications and inappropriate medications or drugs with abuse potential, increasing risk of adverse drug events, financial toxicity, poor adherence, and drug-drug interactions. Adolescent and young adult survivors appear at increased risk of polypharmacy.

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Cannabis use after recent colorectal cancer diagnosis

Newcomb PA, Phipps AI, Malen RC, Cohen S, He C, Chun KA, Burnett-Hartman AN

Background. Recent changes in state-level policies have made cannabis (i.e., marijuana) increasingly accessible to cancer patients and survivors. Limited human studies indicate that certain compounds in cannabis (i.e., cannabinoids) may improve management of chemotherapy-associated nausea, appetite, and pain. In vitro and in vivo animal studies suggest that some cannabinoids may also have anti-tumor effects.

Methods. We examined cannabis use in our ongoing study of incident colorectal cancer (CRC) cases identified from the Seattle-Puget Sound SEER in 2016-2017 (N=656, ~65% of eligible). Medicinal and recreational cannabis use has been legal in Washington State since 1998 and 2012, respectively. All cases completed a risk-factor questionnaire eliciting information on medical history, demographic, and lifestyle factors. The interview included several basic questions regarding cannabis use: ever use, use within the past 30 days (current use), and mode and reason for use within past 30 days. Tumor clinical characteristics were obtained from the SEER registry. Univariate analyses only are described.

Results. Cannabis use was reported by 48% of study participants; among ever users, 44% were also current users. Ever cannabis users were younger (P=0.007) and more likely to be male (P<0.001) than never users; similar patterns were observed in current users. Among current users, reasons for use included: management of stress (54%), sleep (49%), and pain (46%), as well as recreation (41%). There were significant differences in the distribution of stage at diagnosis according to cannabis use history. In particular, current users were more likely to be diagnosed with advanced (i.e., SEER- coded regional or distant stage) disease (79.9%) compared to never users (51.4%; P=0.001).

Conclusion. Our results show that the legal use of cannabis among CRC patients in this population is relatively common, and that patterns of cannabis use differ significantly by age and stage at CRC diagnosis. Our future work, including multivariate approaches, will respond to the significant and growing need for scientific information on the relationship between cannabis use after cancer diagnosis with symptom management and subsequent outcomes, such as recurrence and survival.

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The impact of air pollution on the pulmonary morbidity of childhood and adolescent cancer survivors

Ou JY, Hanson HA, Ramsay JM, VanDerslice JA, Leiser C, Zhang Y, Kirchhoff AC

Purpose: Pulmonary late health effects are a major cause of morbidity and mortality among childhood cancer survivors. Identifying contextual factors that increase the risk for pulmonary complications in this population can aid in the development of strategies to manage late effects. Air pollution is a severe threat to healthy children, but its effects on vulnerable childhood cancer survivors is not known.

Methods: Using a case-crossover design, we identified the risk of pulmonary-related and primary pulmonary ED visits and inpatient hospitalizations, separately, from 1999 to 2015 due to exposure to fine particulate matter (PM_{2.5}). We calculated the 2-day lagged PM_{2.5} averages for both the event and control days. Conditional logistic models controlled for temperature and were stratified by sex, race, and cancer-related variables (e.g. diagnosis, chemotherapy). We also compared risk estimates between survivors and a previously matched population sample using interaction terms.

Results: We identified 242 survivors and 379 population sample that had at least one ED visit during the study period. Non-white survivors were at increased risk for primary pulmonary ED visits (OR=2.11, 95% CI=1.17-3.79), compared to both white survivors (OR=1.00, 95% CI=0.88-1.14, p=0.04) and the non-white population sample (OR=0.50, 95% CI=0.21-1.24, p=0.04). Survivors had a higher risk of pulmonary-related hospitalizations (OR=1.22, 95% CI=0.99-1.51) compared to the population sample (OR=0.78, 95% CI=0.56-1.09, p=0.04). Leukemia survivors had the highest risk for any pulmonary ED visit (OR=1.40, 95% CI=1.06-1.86) and inpatient hospitalization (OR=1.81, 95% CI=1.02-3.22) than any other cancer diagnosis. Survivors who were treated with chemotherapy had a significantly increased risk for primary pulmonary hospitalizations (OR=2.22, 95% CI=1.12-4.41).

Conclusions: Air pollution poses a significant threat to the pulmonary health of childhood cancer survivors. Reducing exposure may provide one method of reduction the total burden the pulmonary complications in this population. Recommendations for avoiding pollution exposure should be included in future survivorship care guidelines.

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Factors associated with surveillance colonoscopy adherence among survivors and previvors with Lynch syndrome: results from a tertiary cancer center in the US

Pande M, Thirumurthi S, Lum PJ, Mork ME, Bannon SA, Peterson SK, Vilar Sanchez E, You YN, Rodriguez-Bigas MA, Lynch PM

Purpose: Lynch syndrome, caused by inherited mutations in DNA mismatch repair (MMR) genes, is associated with increased lifetime risk of colorectal cancer. Therefore, standard of care guidelines recommend surveillance by colonoscopy every 1-2 years. Our goal was to identify predictors and outcomes of delayed versus on-time surveillance.

Methods: Retrospective surveillance data were abstracted from endoscopy databases from 2001-2017, for all confirmed pathogenic MMR mutation carriers, with and without history of cancer (i.e. survivors and previvors). Patients that received at least 2 successive screening colonoscopies were analyzed (n=195). Delayed surveillance was defined as colonoscopy interval of >2 years between one or more successive colonoscopies. Multivariable logistic regression was used to analyze the association of sex, race, survivor/previvor status, age at first colonoscopy, MMR gene mutated, and adenoma/carcinoma outcomes, with delayed surveillance.

Results: The sample was 84% non-Hispanic white, 51.4% male, and 74% cancer survivors. Of the 833 colonoscopies performed, 89.4% were on-time, at ≤2 year interval. Mean interval was 12.6 months for on-time surveillance and 36.8 months for delayed. Surveillance started earlier for previvors than for survivors (mean age 43.3 vs. 53.9 years, P<0.01), mean number of colonoscopies was 4.7 vs. 6.5, and previvors had a higher proportion of one or more delayed colonoscopies than survivors (15.3% vs. 9.4%, P=0.03). On multivariable analysis, delayed surveillance was associated with being a previvor (OR: 1.70, 95% CI: 1.00 - 2.91, P= 0.05), and being female (OR: 1.83, 95% CI: 1.15 - 2.89, P=0.005). Delayed surveillance was not associated with race/ethnicity, age at first colonoscopy, MMR gene mutated, or positive findings on colonoscopy (adenoma detection rate 27.3% vs. 25.8% and carcinoma 3.4% vs. 1.5%, P>0.05).

Conclusion: Overall rates of delayed surveillance were low (10.6%). Delayed surveillance was more likely among women than men, and among previvors compared to survivors. There was no difference in adenoma/carcinoma detection, although few interval cancers were detected, suggesting longer surveillance intervals may be acceptable for Lynch syndrome, if confirmed by larger prospective studies.

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Are low-income participants in a comprehensive cancer survivorship program more likely to receive colorectal and breast cancer screening?

Pruitt SL, Ge Z, Berry E, Borton EK, Argenbright K, Heitjan DF

Background Comprehensive cancer survivorship programs provide lifestyle education and counseling that may result in improved adherence to recommended preventive services such as cancer screening. We studied survivors receiving care at an urban safety-net healthcare system serving low-income, uninsured patients in Tarrant County, TX. We compared breast and colorectal cancer (CRC) screening among program participants and non-participants.

Methods We merged data from 3 sources: tumor registry and electronic medical records from the healthcare system and the program database. We identified patients diagnosed with any cancer type, 2008–15; we matched each participant with 3 non-participants using propensity scores including sex, age, race/ethnicity, language, marital status, alcohol and tobacco use, number of total primary cancers, cancer type, stage, grade, and diagnosis year and location. We measured mammography among females aged ≥ 40 years not diagnosed with breast cancer. We measured CRC screening among patients aged ≥ 50 years not diagnosed with CRC. We used mixed Poisson models to describe screening uptake (yes vs. no) each year after program enrollment (participants) or diagnosis (non-participants) until end of follow-up. We compared screening of participants vs. non-participants using matched data, including patient-level random effects and adjusting for follow-up time.

Results Race/ethnicity was evenly split between Hispanic, White, or Black. Of 157 participants and 471 matched non-participants eligible for mammography, most had uterine (15.3%) or colorectal cancer (13.5%), and had localized or in situ disease (41.4%). Of 269 participants and 807 matched non-participants eligible for CRC screening, most were female (65.6%), had breast (27.6%) or prostate (10.8%) cancer, and had localized or in situ disease (44.4%). Program participants were more likely to complete CRC screening (RR=1.56, $p=0.04$), but not mammography (RR=1.49 $p=0.21$), when compared to matched non-participants.

Conclusion Survivorship programs—even those not designed to focus on screening behavior—may increase CRC screening among participants. Future efforts should focus on increasing mammography and other recommended preventive services among survivors participating in these programs.

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Burden of Pulmonary Complications during Early Survivorship among Children, Adolescents, and Young Adults with Cancer

Ramsay JM, Ou JY, Kirchhoff AC

Purpose: Childhood and adolescent and young adult (AYA) cancer patients experience high rates of pulmonary morbidity and mortality from the therapies used to treat their cancers. Using emergency department (ED) data, we report on late respiratory health effects among a statewide cohort of Utah-based survivors five to ten years after diagnosis, defined as early survivorship. Our study is the first to use ED visits, an objective measure of adverse respiratory health, to evaluate the burden experienced by pediatric and AYA survivors relative to a non-cancer comparison cohort.

Methods: ED visits for pulmonary outcomes were examined among children and AYAs diagnosed with cancer ($N=1,634$) compared to a birthdate and sex matched non-cancer comparison cohort ($N=4,895$) drawn from the general population. Multivariable Poisson regression was used to estimate incidence rates (IRs), rate ratios (RRs), and 95% confidence intervals (CI) for all primary pulmonary ED visits combined and stratified by pulmonary diagnosis (asthma, respiratory disease, and respiratory infection).

Results: Relative to the comparison cohort, cancer cases had higher IRs per 100 person years for all types of pulmonary ED visits (any pulmonary condition: Case=1.55 vs. Control=0.75, $p<0.001$; asthma: 0.17 vs. 0.04, $p=0.04$; respiratory disease: 0.24 vs. 0.20, $p=0.52$; and respiratory infection: 1.14 vs. 0.50, $p<0.001$). In adjusted models, cancer cases also had significantly elevated RRs for any pulmonary condition (RR=2.04, 95% CI: 1.57- 2.64), asthma (RR=4.27, 95% CI: 1.63- 11.19), and respiratory infection (RR=2.19, 95% CI: 1.62-2.98). Among survivors, several demographic and clinical risk factors for pulmonary ED encounters were also identified including other race/ethnicity, male, diagnosis before 2004, leukemia or lymphoma diagnosis, and lower parental education.

Conclusions: Early survivorship is a time of increased risk for poor respiratory health leading to a higher burden of pulmonary disease among childhood and AYA survivors relative to a non-cancer comparison cohort.

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Interactive Patient-centered Website to Prevent Dysphagia in Irradiated Pharyngeal Cancer Patients

Shinn, EH, Trevino-Whitaker, RA, Kamunyo, EW, Jasemi, N, McLaughlin, J, Garden, AS, Jensen, KM

Purpose: To provide evidence-based preventive speech pathology services (evaluations and swallowing exercises) and an effective adherence program via a mobile health technology application to head and neck cancer patients during radiation.

Methods: We developed a responsive web-based application program to help patients adhere to preventive swallowing exercises and cope with radiation side effects. The website (English and Spanish) features tracking logs for weight loss, trismus and swallowing exercises, how-to-videos, patient's stories and all-inclusive search bar. Participants at community outpatient clinics based in Fort Worth and Galveston, TX are taught how to log in and navigate the secure interactive website before radiation and are given access to new weekly modules every week for 10 weeks.

Results: One hundred and twelve patients have been enrolled into the prevention program; 52 who received a non- interactive pilot version of the web-based program and 60 who have received the full-scale interactive program. Accrual rates are approximately 95%, with the most common reason for refusal is dislike of a computer-based platform. Approximately 38% of the enrolled patients are either uninsured or low-SES patients. Fifteen mobile tablets with monthly data plans have been distributed to patients without access to computers or smartphones. All 112 patients have received preventive and diagnostic speech pathology services, including fiberoptic endoscopic swallowing tests (FEES). Of the 60 patients who have been enrolled onto our full-scale interactive website, 75% have logged in at least once and over 50% log in regularly throughout the course of their radiation; each visit to the website averages 7 min 38 sec and 8.2 different actions (page views, downloads, searches). Most participants are viewing the swallowing and trismus exercise videos, the cooking demonstrations, and "what to expect this week." Patients have rated the program highly on helpfulness in coping with radiation side effects and with adhering to swallowing and trismus exercises.

Conclusion: Head and neck cancer patients are highly satisfied with technology-based intervention designed to help them cope with radiation side effects and prevent long-term swallowing dysfunction.

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Long term outcomes of ductal carcinoma in situ (DCIS) of the breast in a population-based cohort

Sprague BL, Vacek PM, Herschorn SD, James TA, Geller BM, Trentham-Dietz A, Stein JL, Weaver DL

Approximately 25% of breast cancers detected by screening mammography are ductal carcinoma in situ (DCIS), a noninvasive form of breast cancer. Uncertainty regarding whether all DCIS has malignant potential has generated concern about overtreatment. With limited data on outcomes of untreated DCIS, information on long term outcomes after treated DCIS is useful to identify patient subgroups that may be appropriate for trials of active surveillance or other novel management strategies. We identified 1488 women diagnosed with primary DCIS in Vermont during 1993-2012. Medical records data were prospectively obtained by the Vermont Breast Cancer Surveillance System, which includes a registry of breast imaging performed at radiology facilities in Vermont, a statewide breast pathology database, and linkage to the Vermont Cancer Registry (VCR). A centralized review of available archived tumor specimens (N=1108) permitted confirmation of DCIS in 1070 cases (96.6%). Follow-up for long term outcomes was achieved through monitoring of radiology, pathology, and VCR records. During 11,112 person-years of follow-up (median 7.7 years), 206 cases experienced a second breast cancer diagnosis (1.9 per 100 person-years). The rate of second events was 2.5 per 100 person-years (95%CI:2.0,3.1) among cases diagnosed during 1993-1999 and declined to 1.4 per 100 person-years (95%CI:0.8,2.1) among cases diagnosed during 2009-2012. This decline was attributable to temporal changes in adjuvant treatment. In multivariable- adjusted models, risk of a second event was reduced by 32% among women treated with breast conserving surgery (BCS) and radiation (HR=0.68; 95%CI:0.48,0.96) and by 62% among women treated with BCS, radiation, and endocrine therapy (HR=0.38; 95% CI:0.24,0.60), in comparison to women treated with BCS only. Radiation therapy reduced the risk of an ipsilateral event (HR=0.49; 95%CI:0.33,0.72), whereas endocrine therapy reduced the risk of both ipsilateral (HR=0.47; 95%CI:0.29,0.74) and contralateral (HR=0.42; 95%CI:0.22,0.82) events. Risk reducing treatment effects were similar for both DCIS and invasive second events. Future analyses will evaluate patient factors, tumor characteristics, and tumor/stromal molecular markers in relation to long term outcomes.

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Development of a Specialized Head and Neck Cancer Survivorship Care Plan

Sterba KR, Zapka J, Scallion M, Rudolph N, Armeson K, Wall TK, Graboyes EM, Day T

Purpose: Oncology guidelines require the delivery of survivorship care plans (SCPs) after treatment to facilitate care transitions. Due to unique challenges faced in head and neck cancer (HNC), a specialized SCP is needed. Using qualitative methods, we characterized perspectives of HNC survivors, caregivers and multidisciplinary providers on survivorship care elements to guide development of content and format for an HNC SCP template.

Methods: HNC survivors (N=20) who completed treatment <2 years ago and their caregivers (N=17) and HNC providers (N=15), completed key informant interviews. Participants described post-treatment challenges and provided feedback about a sample SCP. Content analysis was used to map themes to essential elements of survivorship care (surveillance, late/long-term effects, health promotion) and SCP visit preferences were summarized.

Results: Survivors (65% male, mean age=62; 40% oral cavity cancer) and caregivers (70% partners) strongly valued surveillance to monitor symptoms and check for recurrence. The majority of survivors (90%) saw >3 specialists and relied on the coordination of multiple visits. Providers recommended additions to the SCP including: 1) key care team members (e.g., maxillofacial prosthodontist, speech pathologist), 2) clinical factors (HPV status, HNC-specific symptoms to watch) and 3) personalized follow-up care dependent on treatment and behaviors. Dyads reported wanting to discuss expectations about symptom recovery even when uncertainty exists. Primary late/long-term effects were suggested (e.g., dry mouth, speech/swallowing, neck mobility, appearance) and a shortened symptom list was proposed for those who had surgery only. Participants welcomed a focus on health promotion and caregivers especially appreciated consideration of their own well-being. Participants consistently emphasized the need for a flexible approach to the SCP to accommodate varied recovery experiences and recommended the SCP visit occur around 6 months post-treatment. A binder format for resources was preferred to share with family and other providers.

Conclusions: Results confirmed the need for a specialized SCP visit for HNC survivors and their caregivers and resulted in key content and format specifications for an HNC-specific care plan.

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Diet Behavior Change for Bowel Symptom Management in Rectal Cancer Survivors: the Altering Intake, Managing Symptoms (AIMS) Intervention

Sun V, Crane TE, Slack SD, Yung A, Wright S, Krouse RS, Thomson CA

Purpose of the Study: To describe the design of the Altering Intake, Managing Symptoms (AIMS) intervention to manage bowel symptoms in rectal cancer survivors, a population that reports high bowel symptom burden after surgery/treatment.

Methods: AIMS is a telephone-based intervention delivered in ten 40-60 minute sessions over 4 months to rectal cancer survivors who are 1-13 years post-surgery. A workbook is provided to participants as a support reference. Based on the Chronic Care Self-Management Model (CCM), AIMS applies social cognitive theory to increase self-efficacy and enhance self-management of bowel symptoms. Survivors receive support to modify their diets based on the hypothesis that tailored coaching will attenuate symptoms while improving diet quality. Motivational interviewing-based behavioral approaches are applied; these include goal setting, self-monitoring, identification of barriers, and problem-solving. Diet health is assessed by repeat 24-hour dietary recalls combined with food and symptom diaries to promote survivor-directed behavior change.

Results: To date 10 rectal cancer survivors have completed a 16 week intervention. Preliminary results suggest high satisfaction of the intervention in completers. Among non-completers (N=5), all consented to participate; one non-completer participated in 4 sessions only. This suggests that rectal cancer survivors may feel the need to consent, but not have intrinsic motivation to participate or that the workbook may provide ample support in their estimation. To address this, the follow-on study will include a run-in period to evaluate readiness to change prior to randomization. Exit interviews from active participants are expected to inform on the selection of proposed approaches.

Conclusions: AIMS is one of the first intervention to address diet behavior changes for symptom management in rectal cancer survivors. The single site, single group pilot study currently underway will assess the feasibility and acceptability of the intervention. Findings will inform the design and development of future multi-site Phase II and III randomized trials.

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Differences in Treatment Outcomes in Children who Experienced Methotrexate-related Neurotoxicity while Receiving Acute Lymphoblastic Leukemia Therapy

Taylor OA, Brown AL, Brackett J, Dreyer ZE, Moore I, Mitby P, Hooke MC, Hockenberry MJ, Lupo PJ, Scheurer ME

Purpose: Our objective was to evaluate the impact of methotrexate (MTX)-related neurotoxicity (NT) on therapy in a multi-institutional prospective cohort of pediatric patients (2- 17 years old) with acute lymphoblastic leukemia (ALL).

Methods: Suspected NT cases were defined as patients with a neurologic event following intrathecal (IT) and/or intravenous (IV) MTX that led to a change in subsequent MTX therapy. Multivariable linear regression models were generated to compare treatment differences between patients with and without MTX NT. The frequency of all-cause and central nervous system (CNS) relapse was compared between patients with and without MTX NT using the log-rank test and Cox regression models.

Results: Of the 280 patients enrolled, 39 (13.9%) experienced MTX NT (median follow-up = 22.6 months; range: 1.3 - 55.6 months). Importantly, 74% of patients experiencing NT were Hispanic (compared to 44% among those without NT, $p < 0.001$). Independent of treatment risk arm, sex, and age at diagnosis, patients who experienced MTX NT received an average of 2.25 (95% CI: 1.73-2.77) fewer doses of IT MTX. Six of the 39 cases of MTX NT (15.4%) experienced relapse during the study period, compared to 13 of the 241 (2.1%) patients without MTX NT (log-rank $p = 0.0038$). CNS relapse was significantly more frequent among patients with MTX NT (10.3%) than patients without NT (2.1%; log-rank $p = 0.0014$). In univariate Cox regression models, MTX NT was significantly associated with CNS relapse (unadjusted HR: 3.80, 95% CI: 1.44-10.02), a trend which remained after individually accounting for treatment risk arm (HR: 2.92, 95% CI: 1.07-7.95), MRD status at day 29 (HR: 3.49, 95% CI: 1.32-9.24), race and ethnicity (HR: 3.15, 95% CI: 1.13-8.79), age at diagnosis (HR: 2.56, 95% CI: 0.91-7.21), and gender (HR: 3.82, 95% CI: 1.44-10.10).

Conclusion: We identified an increased risk of CNS relapse among ALL patients following MTX NT, which was not fully explained by other clinical or demographic risk factors. Further, incidence of NT was higher among Hispanic patients in our clinics. Future studies will examine pharmacogenetics related to MTX metabolism, especially among Hispanic patients, who experience worse treatment outcomes despite having more favorable disease characteristics

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Hospital Quality and Ovarian Cancer Survival in the Nurses' Health Studies

Townsend MK, Mallen A, Chon HS, Tworoger SS

Use of National Comprehensive Cancer Network treatment guidelines for ovarian cancer is related to improved survival, and treatment at an NCI Comprehensive Cancer Center (NCI-CCC) or by a gynecologic oncologist are independent predictors of guideline adherence. Our aim was to assess the association between type of hospital where primary cytoreductive surgery was performed and survival among ovarian cancer patients in a population-based study of women living across the US. We pooled two prospective cohorts of registered nurses, the Nurses' Health Study (NHS), initiated in 1976, and NHSII, initiated in 1989. Eligible ovarian cancer cases were diagnosed after enrollment and had data on hospital of primary surgery. Hospitals were categorized by type (NCI-CCC, academic hospital, community hospital) and by presence/absence of a gynecologic oncology fellowship program (as a marker for access to specialist care). We used Cox proportional hazards models to estimate relative risks (RR) and 95% confidence intervals (CI) for ovarian cancer-specific mortality adjusting for age, histologic subtype, morphology, stage and cohort. In total, 1,084 ovarian cancer cases were diagnosed through 2014. The majority (62.6%) had initial surgery at a community hospital, 14.9% were seen at an NCI-CCC, 19.4% at an academic center, and 3.1% were not unclassifiable; 15.0% were seen at a center with a fellowship program. Compared to a community hospital, cases who sought care at an NCI-CCC had a suggestively lower risk of death (RR=0.82, 95%CI=0.67-1.02), but no association was observed for academic hospitals (RR=0.96). Similarly, compared to community hospitals, there was suggestively improved survival (RR=0.87, 95%CI=0.70-1.07) for cases seen at a center with a gynecologic oncology fellowship program that was more apparent for women with non-serous (RR=0.69) versus serous tumors (RR=0.96). Despite the health background of this population, few ovarian cancer cases sought care at high-volume centers or centers with specialist care, which was suggestively associated with improved survival, particularly for non-serous histotypes in this geographically dispersed population. More research considering surgical outcomes and other populations is warranted.

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Helicobacter pylori Blood Biomarkers and Gastric Cancer Survival in China

Varga MG, Wang T, Cai H, Xiang YB, Gao YT, Ji B, Pawlita M, Waterboer T, Zheng W, Shu XO, Epplein M

Purpose: Infection with *Helicobacter pylori* is the leading risk factor for non-cardia gastric cancer, yet its influence on prognosis of gastric cancer is largely unknown. Thus, exploring the role of *H. pylori* in survival could lead to a greater understanding of the high mortality associated with gastric cancer.

Methods: Sero-positivity to 15 *H. pylori* antigens was assessed using a multiplex assay in two prospective cohorts, the Shanghai Men's Health Study and the Shanghai Women's Health Study. Multivariable-adjusted Cox proportional hazards regression was used to examine the association between pre-diagnostic *H. pylori* antigen levels and gastric cancer-specific survival.

Results: Pre-diagnostic levels of *H. pylori* serum antibodies that were previously associated with gastric cancer incidence in this population were not associated with gastric cancer survival, whether assessed in a 6-antigen panel (HR 1.29, 95% CI 0.78-2.13 for men; HR 0.93, 95% CI 0.57-1.52 for women), focused on the cancer-associated toxin CagA+ *H. pylori* (HR 1.27, 95% CI 0.70-2.31 for men; HR 0.73, 95% CI 0.44-1.20 for women) or on the high cancer-risk *H. pylori* blood biomarkers of dual Omp and HP 0305 sero-positivity (HR 1.37 95% CI .97-1.94 for men; HR 0.97, 95% CI 0.72-1.30 for women). Adjustment for or stratification by previously established factors associated with gastric cancer survival, including tumor stage and treatment, did not alter these null findings.

Conclusions: We conclude that pre-diagnostic *H. pylori* antigen levels are not associated with gastric cancer survival in East Asian populations. Therefore, identification of additional factors associated with gastric cancer survival would further our understanding of the high mortality associated with this malignancy.

176-T

DNA methylation may modify the associations between pre-diagnosis aspirin use and mortality after breast cancer

Wang T, McCullough LE, White AJ, Bradshaw PT, Xu X, Cho YH, Terry MB, Teitelbaum SL, Neugut AI, Santella RM, Chen J, Gammon MD

Background: We hypothesized that epigenetic changes may help to clarify the underlying biologic mechanism linking aspirin use to breast cancer prognosis. Ours is the first study to examine whether global methylation and/or tumor promoter methylation of breast cancer-related genes interact with aspirin use to impact mortality after breast cancer.

Methods: Pre-diagnosis aspirin use was assessed through in-person interviews in a population-based cohort of 1,508 women newly diagnosed with first primary breast cancer in 1996-1997. Global methylation in peripheral blood DNA was assessed by long interspersed elements-1 (LINE-1) and luminometric methylation assay (LUMA). Promoter methylation of 13 breast cancer-related genes were measured in tumor tissue by methylation-specific PCR and Methyl Light. The National Death Index was used to ascertain vital status through December 31, 2014 (N=237/597 breast cancer-specific/all-cause mortality identified). We used Cox proportional hazards regression to estimate multivariable-adjusted hazard ratios (HRs) and 95% confidence intervals (95% CIs). Multiplicative interaction was evaluated using the likelihood ratio test.

Results: All-cause mortality after breast cancer was elevated among aspirin ever-users with methylated tumor promotor of BRCA1 (HR=1.67; 95%CI=1.26-2.22), but not those with unmethylated tumors (HR=0.99; 95%CI=0.67-1.45) (p for interaction $\leq$ 0.05). Decreased breast cancer-specific mortality was found among aspirin users with unmethylated tumor promotor of BRCA1 and PR, and global hypermethylation of LINE-1 (HR=0.60, 0.78, and 0.63, respectively; p for interaction $\leq$ 0.05), although the corresponding 95% CIs included the null value.

Conclusion: The association between aspirin use and mortality after breast cancer may be modified by tumor promoter methylation of BRCA1 and PR genes, and LINE-1 global methylation.

177-T

Cognitive Function Post-Brain Irradiation: Characterizing Better-Performing Brain Cancer Survivors

Wong SS, Pajewski NM, Avis NE, Cummings TL, &
Rapp SR

Although brain cancer and its treatment generally impacts cognitive functioning, there may be a subset of survivors who do not evidence significant cognitive impairment post-treatment. This exploratory study seeks to a) identify brain tumor survivors with relatively intact cognitive functioning post-brain irradiation for brain cancer treatment and b) compare these survivors to those with poorer cognitive functioning on demographic, clinical, and psychosocial factors. A cognitive battery assessing memory, attention, language, and executive function was administered to 198 adult brain tumor survivors who were $\geq$ six months post-brain irradiation as part of a Phase 3 clinical trial. Better-performing survivors were defined as scoring within 1.5 standard deviations of the mean on each cognitive task using age- and education-adjusted norms. Survivors scoring outside of this criteria were identified as the poorer-performing group. T-test and chi-square analyses were conducted. 24% (n=48) of our sample met criteria for the better-performing group. These survivors were more likely to be White (p=0.03) and reported higher income (p=0.04) than the poorer-performing group (n=150). Better-performing survivors were also less likely to receive whole-brain irradiation (WBI; p=0.046), and reported higher functional well-being (e.g. ability to work, p<0.001), fewer subjective cognitive problems (p<0.001) and less fatigue (p=0.002). No significant group differences were found for age, education, sex, time since diagnosis, tumor location, resection size, total brain volume, or depression. Our preliminary findings suggest that there is a sizeable subgroup of brain tumor survivors with relatively intact cognitive functioning after a full course of brain irradiation. Understanding how these survivors differ from those with poorer cognitive functioning may lead to uncovering contributors to cognitive resilience. Although pre-treatment cognitive assessments are needed, our results suggest that type of radiation therapy (WBI or focal irradiation) is a major clinical factor associated with cognitive performance and functional activity. More research is needed to explore how neurotoxic effects of WBI may be buffered in brain cancer survivors.



2018 Joseph W. Cullen Memorial Award for Excellence in Tobacco Research

Thomas Brandon, PhD
Moffitt Cancer Center and Research Institute



The ASPO community would like to congratulate Thomas H. Brandon, PhD, for being named the recipient of the Joseph W. Cullen Memorial Award.

Few scientists ever see the day when they are able to influence national practice and policy guidelines. Dr. Brandon is among this elite group. For over 30 years, Dr. Brandon's research program has identified factors that maintain tobacco dependence and used this information to develop novel tobacco-cessation and relapse-prevention interventions. He has collaborated broadly across disciplines to accomplish the goal of reducing tobacco dependence using approaches ranging from basic human laboratory research to applied research.

Dr. Brandon developed cost-effective and efficacious self-help interventions for smoking relapse prevention and smoking cessation entitled, *Forever Free*. These booklets are available on NCI's smokefree.gov website and have been adapted for use by the National Health Service in the UK, demonstrating the global public health significance of his work. Dr. Brandon's research efforts to develop smoking cessation and relapse prevention materials also extend to understudied special populations including the military, Hispanic smokers, dual users of tobacco and e-cigarettes, and cancer patients.

As a member of the American Association of Cancer Research's Tobacco Policy Committee, Dr. Brandon co-authored policy guidelines for assessing, treating, and studying tobacco use among cancer patients. Dr. Brandon also co-authored policy guidelines related to the burgeoning area of electronic nicotine delivery systems.

Congratulations to
DR. BETI THOMPSON
2018 ASPO Distinguished Achievement Award Recipient



*Member, Public Health Sciences Division & Associate Director, Health
Disparities Research Center,
Fred Hutchinson Cancer Research Center*

Dr. Thompson has devoted her entire career to improving cancer prevention in underserved populations across Washington State and beyond. For over 30 years, she's worked tirelessly with diverse partners to conduct community-based participatory research; Fred Hutch's Health Disparities Research Center, under her leadership, has systematically identified barriers to care and designed interventions to narrow the health care divide. Dr. Thompson has made a lasting impact in the field of public health through research, health education, mentoring, volunteerism, policy and advocacy — all the while maintaining a humble heart for communities in need.

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CANCER EPIDEMIOLOGY FACULTY POSITION



The Cancer Epidemiology Program in the Division of Public Health Sciences at the Fred Hutchinson Cancer Research Center invites applications for a faculty position at the Assistant or Associate Member level depending on qualifications. We seek candidates whose research interests are focused on advancing knowledge of the etiology of cancer or identifying determinants of outcomes following cancer diagnosis, including prognosis and treatment response/toxicity. Areas of particular interest include, but are not limited to, molecular and genetic epidemiology; pharmacoepidemiology; electronic health records, geospatial measures, mobile technology, and other novel biomedical data sources; social determinants; and survivorship.

The Cancer Epidemiology Program is part of the Fred Hutch's Division of Public Health Sciences, home of an extensive portfolio of population science research, large specimen and data repositories, a SEER cancer registry, a prevention center designed for intervention research, and a large multidisciplinary faculty. Fred Hutch, together with the University of Washington, Seattle Children's, and the Seattle Cancer Care Alliance, is an NCI-designated Comprehensive Cancer Center with active training programs for graduate students and postdoctoral fellows. An affiliation with the University of Washington is possible, depending on qualifications and interests.

APPLICATION INSTRUCTIONS

Qualified applicants will have a doctoral degree, training in cancer epidemiology (or a related discipline), and relevant research experience. Applications should be submitted to <https://apply.interfolio.com/48564>. Review of applications will continue until the position is filled.

APPLY NOW

FRED HUTCHINSON CANCER RESEARCH CENTER

1100 Fairview Ave. N. / Seattle, WA 98109 / 206.667.6468 / fredhutch.org



Post Doctoral Fellowship Opportunity in Breast Cancer Research

OPEN POST DOCTORAL FELLOWSHIP POSITION IN CANCER EPIDEMIOLOGY

Department of Epidemiology and Biostatistics
Memorial Sloan Kettering Cancer Center
New York, New York

The Division of Epidemiology within the Department of Epidemiology and Biostatistics at Memorial Sloan Kettering Cancer Center (MSK) in New York City invites applications for a post doctoral fellow position, available immediately, within our active research group in Breast Cancer Epidemiology. We seek talented and motivated candidates who plan to begin or expand their research career as a cancer epidemiologist and who wish to play a leading role on projects focused on population-based research of patients with double malignancies as well clinical studies conducted within the large, unique MSK patient population. In addition, the position offers exciting opportunities for multi-disciplinary collaborations and professional development including publication in scholarly journals, presentation at scientific conferences, and involvement in grant proposal writing.

Candidates must hold a PhD, combination PhD/MD, or MD degree. Other requirements include strong communication and quantitative skills, experience in research design, and excellent writing and verbal skills. Please send a cover letter, CV, research statement, and contact information for 2 references to the address below. Information about the Department and Center are available at www.mskcc.org/epidemiology.

MSK is an equal opportunity employer. It is located in the heart of Manhattan and is one of America's premier cancer centers staffed by a world-class faculty including clinicians, geneticists, pathologists, biostatisticians, cancer biologists, and others involved in cancer research.

Please address inquiries to:

Dr. Jonine Bernstein
Department of Epidemiology and Biostatistics
Memorial Sloan Kettering Cancer Center
485 Lexington Avenue, 2nd floor.
New York, NY 10017
bernstej@mskcc.org

Epidemiology Service

Department of Epidemiology and Biostatistics

485 Lexington Avenue, 2nd Floor, New York, NY 10017 T 646.888.8300 F 929.321.1516
www.mskcc.org

NCI-designated Comprehensive Cancer Center

Employment Announcement

CANCER EPIDEMIOLOGIST FACULTY POSITION

Department of Epidemiology and Biostatistics
Memorial Sloan Kettering Cancer Center
New York, New York

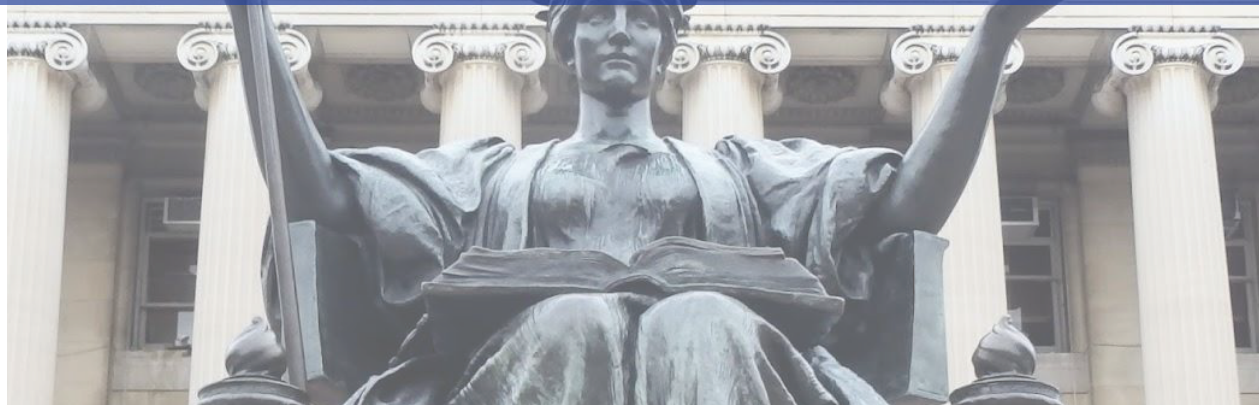
Applications are invited for a faculty appointment in the Department of Epidemiology and Biostatistics. We seek a colleague who will build a program of independent research in cancer epidemiology in a multidisciplinary collaborative environment located in a major academic cancer center.

The MSK environment encourages and provides unparalleled opportunities for fostering multi-disciplinary collaborations with clinicians, geneticists, pathologists, biostatisticians, cancer biologists and others involved in cancer research as well as patient care. Our large patient population, coupled with the extensive core facilities and distinguished research tradition provides exciting opportunities and a dynamic environment for the creation of an independent research program in epidemiology. Unique features of the institution include access to considerable numbers of rare cancer types, patients with double malignancies or other known genetic syndromes, and rapid access to large populations of patients with more common types of cancer. There are also numerous opportunities to build upon and expand existing on-going epidemiologic investigations.

Candidates should hold a PhD or an MD, and should have post-doctoral research training. Any level of experience will be considered, with the appointment at an appropriate academic rank. MSKCC is an equal opportunity employer with generous compensation and benefits packages. Please send a cover letter, CV, research statement, and contact information for 3 references to the address below. Information about the Department is available at <http://www.mskcc.org/research/epidemiology-biostatistics/epidemiology>.

Katherine Cheung
[Epidemiology Search]
Assistant to the Chairman
Department of Epidemiology and Biostatistics
Memorial Sloan Kettering Cancer Center
485 Lexington Avenue, 2nd floor
New York, NY 10017
wongk1@mskcc.org

THE HERBERT IRVING COMPREHENSIVE CANCER CENTER (HICCC)
AT COLUMBIA UNIVERSITY IS
PROUD TO SUPPORT THE **42ND ASPO ANNUAL MEETING**



COLUMBIA UNIVERSITY
MEDICAL CENTER

 **NewYork-Presbyterian**
The University Hospital of Columbia and Cornell

We congratulate ASPO's Leadership and Program Committee and we welcome you to New York City!

We hope you enjoy our great city and visit us uptown where we
have been leading in cancer research for over a century.

HERBERT IRVING COMPREHENSIVE CANCER CENTER
A NATIONAL CANCER INSTITUTE COMPREHENSIVE CANCER CENTER

1911 – Columbia's Institute for
Cancer Research Founded

1972 – NCI-designated 1972

1979 – NCI-Comprehensive Status



INDIANA UNIVERSITY

SCHOOL OF NURSING

T32 Postdoctoral Fellowships* Available in Behavioral

Oncology Research in Indianapolis, IN for the Fall of 2018

To meet with the Program Director, Dr. Victoria Champion,

Distinguished Professor of Nursing, at ASPO contact:

Liza Sumpter, sumpterl@iu.edu

Or visit: goo.gl/aopaoc

*Fellowships are full-time two year commitments supported by the

National Cancer Institute, T32CA117865

The Environment and Breast Cancer: Transforming Data into Action

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Breast Cancer and the Environment Research Program

Nov. 8-9, 2018

Washington, D.C.

<https://bcerp.org>

Georgetown University Hotel
and Conference Center

A transdisciplinary breast cancer prevention conference for basic scientists, epidemiologists, communications researchers and breast cancer advocates.

Sponsored by the National Cancer Institute and the National Institute of Environmental Health Sciences

Abstract submissions will be accepted April 15-Aug. 15. Presenters will be notified in September.



Postdoctoral Fellowship Opportunities In Cancer Prevention and Control

We invite applications to our two outstanding post-doctoral training programs in ***behavioral oncology and molecular epidemiology of cancer***.

These NCI-supported interdisciplinary training programs are designed to prepare fellows for careers as independent investigators engaged in either research in behavioral aspects of cancer prevention, early detection and control or in epidemiological research that incorporates biomarkers identified at the molecular, biochemical, or -omic level. These two-year programs combine a specialized curriculum (formal didactic training and one-on-one interactions with mentors) with research experience (participation in funded studies under the guidance of an experienced investigator).

Applicants are required to have a terminal degree (e.g., PhD, EdD, ScD, DPH or MD) in a social science, a behavioral science, nursing, education, public health, or in epidemiology, medicine or related discipline. It is anticipated that most candidates to the molecular epidemiology of cancer training program will have some previous training in epidemiology and/or biostatistics.

Moffitt has a large and engaged post-doctoral association. Stipends and benefits are highly competitive, and Tampa should appeal to those who appreciate great beaches, outdoor activities, culture, restaurants, and a low cost of living. Review of applications will begin immediately and continue until positions are filled. Applicants must be U.S. citizens or legal permanent residents. Individuals on temporary visas are not eligible.

To apply, please access the following websites
for your program of choice.

www.Moffitt.org/BehavioralOncology
www.Moffitt.org/CancerEpidemiologyT32



The Division of Cancer Prevention and Population Sciences at MD Anderson Cancer Center honors our faculty and their outstanding leadership and contributions made toward our mission of advancing the fields of cancer prevention and population sciences and eliminating health disparities in cancer.

Karen Basen-Engquist, Ph.D., M.P.H. – ASPO President-Elect



Dr. Basen-Engquist is the Annie Laurie Howard Research Distinguished Professor, in the department of Behavioral Science and the Director of the Center for Energy Balance in Cancer Prevention and Survivorship at The University of Texas MD Anderson Cancer Center.

Dr. Basen-Engquist's research focuses on cancer survivors and the role of health behavior interventions in decreasing the severity of late effects, improving physical functioning, optimizing quality of life and reducing risk of chronic diseases.

A member of ASPO since 1998, Dr. Basen-Engquist led the ASPO Special Interest Group on Survivorship, Health Outcomes, and Comparative Effectiveness Research; served on the planning committee for the annual conference and symposia related to physical activity interventions in cancer survivors; developed a national work group to address barriers to translating research on lifestyle interventions for cancer survivors into survivorship care, and subsequently developed a National Cancer Policy Forum workshop on the topic.

Dr. Basen-Engquist is especially committed to the development of the junior members of ASPO and serves as a mentor through the Junior Member Interest Group.



Paul Cinciripini, Ph.D.

Chair, Behavioral Science
MD Anderson Cancer Center
Appointed 2015



Lorna McNeill, Ph.D., M.P.H.

Chair, Health Disparities Research
MD Anderson Cancer Center
Appointed 2017



Shine Chang, Ph.D.

At-Large Executive
Committee Member
ASPO



TRAINING PROGRAM IN PEDIATRIC CANCER SURVIVORSHIP RESEARCH

Outstanding candidates are invited to apply for postdoctoral fellowships in the Pediatric Cancer Survivorship Research Training Program at St. Jude Children's Research Hospital. This program is designed to provide comprehensive interdisciplinary training to develop the next generation of global scientific leaders in the field.

RESEARCH AREAS

Positions are available with faculty mentors in diverse research areas, including epidemiology; genetics; computational biology; psychology and neuropsychology; neuroscience; exercise physiology; oncology; pharmacology; radiology; surgery; and biostatistics. Positions offer individualized training in research design, data collection, data analysis and interpretation, scientific writing, grant preparation and grant review.

St. Jude leads some of the world's largest survivorship research programs. Data are available from thousands of survivors in two long-term cohort studies, St. Jude Lifetime Cohort Study (SJLIFE) and the Childhood Cancer Survivor Study (CCSS).

PROGRAM BENEFITS

St. Jude is committed to providing an outstanding environment for mentored career development and offers a rich intellectual environment and resources for research training.

Benefits include:

- **Opportunity to obtain a Master of Public Health in epidemiology, biostatistics or health systems policy with full tuition coverage**
- **Opportunities to participate in St. Jude Global Pediatric Medicine program conducting clinical outcomes research in Central and South America, Mexico, Eastern Mediterranean, China, and Southeast Asia**
- **Professional development account and travel support to attend conferences**
- **Competitive stipend above current NIH levels plus relocation assistance, three weeks paid vacation, tuition reimbursement, paid leave, and medical, dental and vision health coverage**

St. Jude Children's Research Hospital is a private nonprofit academic research institution with a mission to advance cures, and means of prevention, for pediatric catastrophic disease through research and treatment. St. Jude is a NCI-designated Comprehensive Cancer Center and is ranked as the #1 pediatric cancer hospital in the country by U.S. News and World Report. For more information on St. Jude see www.stjude.org.

HOW TO APPLY

Applicants must have a PhD or equivalent doctoral degree, MD, DO, or PharmD, with excellent oral and written communication skills. Multiple positions are available, funded through a new T32 NCI training grant or our institutional budget. Applicants to the positions funded by the T32 training grant must be a citizen or a noncitizen national of the United States.

Qualified applicants are encouraged to apply at <http://bit.ly/stjudeASPO>

To apply, please provide a curriculum vitae, transcripts, three letters of reference, and a brief summary of interests.

CONTACT INFORMATION

Kevin Krull, PhD
kevin.krull@stjude.org
<https://www.stjude.org/krull>



Your SOURCE for

- Cancer control research tools, data, resources, and funding announcements
- Information on research networks and consortia focused on cancer control issues
- Survey instruments, measurement tools, and public use data for many topic areas, such as cancer information seeking and decision making, diet, physical activity, tobacco use and cessation, cancer screening, quality and cost of care, cancer outcomes, health disparities, and survivorship
- Cancer statistics, geospatial data, statistical software, and interactive tools from the SEER Program and State Cancer Profiles websites, among others
- Reports, including the Cancer Trends Progress Report and the Annual Report to the Nation on the Status of Cancer
- Monographs about tobacco control, diet and physical activity, cancer incidence, cancer costs, cancer staging and registry data, mortality, and survival
- Intervention products for health communication, nutrition, cancer screening, and smoking prevention and cessation
- Employment and training opportunities in the division
- Smokefree.gov web and mobile mHealth resources for use in research studies
- Information on dissemination and implementation research
- Newsletters, webinars, and social media accounts

What's NEW

- Updated SEER linked data resources, including SEER-Medicare, SEER-Consumer Assessment of Healthcare Providers and Systems (SEER-CAHPS), and SEER-Medicare Health Outcomes Survey (SEER-MHOS)
- Over a dozen language translations of the Patient-Reported Outcomes version of the Common Terminology Criteria for Adverse Events (PRO-CTCAE™)
- Geotagging and geofencing capabilities in Smokefree.gov's QuitGuide and quitSTART smartphone apps to help smokers quit when and where they need it most
- New data from the 2014-2015 wave of the Tobacco Use Supplement to the Current Population Survey (TUS-CPS), to monitor tobacco control progress and evaluate tobacco control programs
- NCI Monograph 22: A Socioecological Approach to Addressing Tobacco-Related Health Disparities
- New functionality in the Grid-Enabled Measures (GEM) portal supports the creation of custom evaluation forms for measure consensus
- Ethical and Regulatory Issues in Cancer Research (ENRICH) Forum webinar series
- Free, public use data files from all iterations of the Health Information National Trends Survey (HINTS)
- Surveillance Research Program Blog: Toward Precision Cancer Surveillance
- NCI GeoViewer, enabling users to create maps of cancer statistics, demographics, and risk factors
- Did You Know? video series, highlighting key topics and trends in cancer statistics
- SEER*Explorer, an interactive website providing easy access to a wide range of SEER cancer statistics (e.g., cancer site by gender, race, calendar year, age)
- Free downloads of physical activity and diet survey data from the 2014 Family Life, Activity, Sun, Health, and Eating (FLASHE) study
- Updated Healthy Eating Index (HEI-2015), a measure of diet quality, which can be used in research, surveillance, and clinical applications to assess compliance with the US Dietary Guidelines for Americans and monitor changes in dietary patterns

Follow us 
 @NCICancerCtrl @NCIBehaviors @NCICancerStats @NCIEpi
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The Sidney Kimmel Cancer Center congratulates The American Society for Preventive Oncology on its 42nd annual meeting



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COMPREHENSIVE CANCER CENTER

Postdoctoral Fellow Opportunities in Cancer Prevention and Control



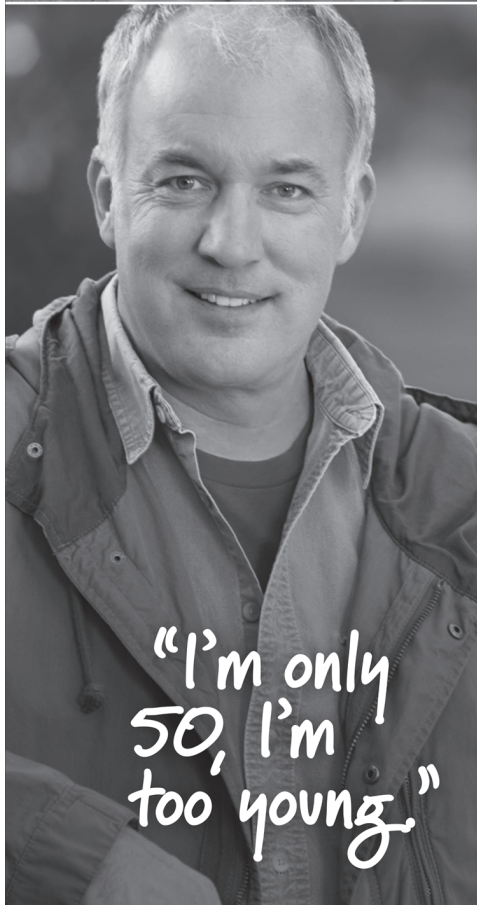
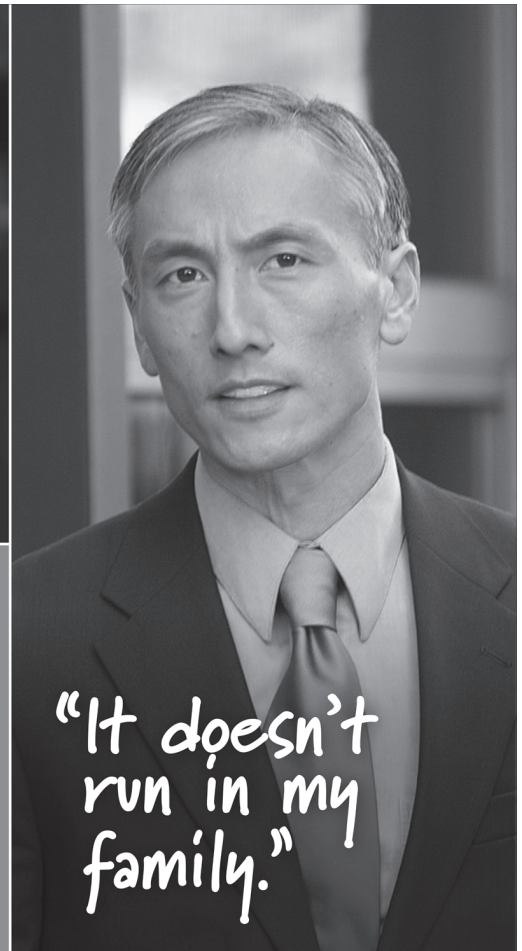
- Candidates interested in health behavior, health disparities, epidemiology, community-based research, or risk communication
- World-leading cancer prevention research, education & outreach at Washington University School of Medicine
- Competitive salary and benefits
- Must be PhD, DrPH, MD, or other doctoral degree in public health

Contact: Dr. Aimee James at aimeejames@wustl.edu

For application or more information:

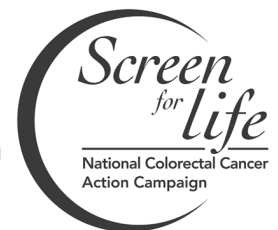
<http://publichealthsciences.wustl.edu/Education/Postdoctoral-Training>





You know your patients aged 50+ should get screened for colorectal cancer – so give them the facts!

Get FREE factsheets and brochures in English and Spanish from the Centers for Disease Control and Prevention.



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www.cdc.gov/screenforlife

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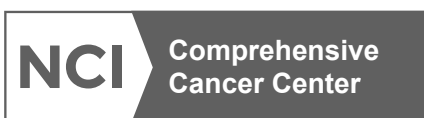
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Cancer Institute of New Jersey

RUTGERS HEALTH

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address the application to:

Dr. Elisa Bandera
Professor and Co-Leader
Cancer Prevention & Control Program
Rutgers Cancer Institute of New Jersey



A Cancer Center Designated by the
National Cancer Institute

Cancer Epidemiology Faculty Position Available
Rutgers Cancer Institute of New Jersey invites candidates to apply for a tenured track faculty position in cancer epidemiology with demonstrated academic track record of publications and grant funding. Academic rank will be commensurate with qualifications and experience. A joint appointment in another academic department/school will be supported.

The successful candidate will join the Population Science Division, Cancer Prevention and Control Program, at Rutgers Cancer Institute, a productive group including cancer epidemiologists, as well as a multi-disciplinary team with expertise in behavioral science, health outcomes research, cancer health disparities, and tobacco control. There are excellent opportunities for collaborations with Rutgers Cancer Institute members at the Rutgers School of Public Health, Robert Wood Johnson Medical School and Princeton University. Rutgers Cancer Institute houses the SEER New Jersey State Cancer Registry, which facilitates research through rapid case ascertainment of new cancer cases. There are also opportunities to be involved in several ongoing studies, including a cohort of breast cancer survivors and to participate in research consortia.

To apply, visit: <http://jobs.rutgers.edu/postings/38122>

Rutgers, The State University of New Jersey, is an Equal Opportunity/Affirmative Action employer, and is compliant with the Americans with Disability Act (ADA). For more information please visit <http://recruitment.rutgers.edu/TheRUCommitment.htm>. Women and minorities are encouraged to apply.

PERLMUTTER CANCER CENTER

Post-Doctoral Fellowship Opportunity in Cancer Epidemiology

NYU Perlmutter Cancer Center in New York City invites applications for a Post-Doctoral fellow position, available immediately, within our active research group on Cancer Epidemiology. The two- to three-year fellowship, which provides a stipend, is sponsored by the National Institutes of Health. Fellows will play a leading role in our research programs, which currently include investigations of the human microbiome and diet/hormonal risk factors in cancer etiology and survivorship and investigation of genetic and environmental risk stratification. The position offers opportunities for multi-disciplinary collaboration and professional development, including publication, presentation at scientific conferences and involvement in proposal writing.

Candidates must hold a PhD in epidemiology or related areas. Other requirements include strong oral and written communication and quantitative skills. Experience in related laboratory work is an added strength.

NYU Langone Health is an equal employment/affirmative action employer and does not discriminate on the basis of race, color, religion, gender, gender identity or expression, sexual orientation, marital/or parental status, age, national origin, citizenship, disability, veterans status, or any other classification protected by applicable Federal, State, or Municipal Law.

Please send a cover letter, CV and contact information for 3 references to the email address below.

Dr. Jiyoung Ahn, NYU Perlmutter Cancer Center Division of Epidemiology/Department of Population Health, NYU Langone Health, 650 First Ave, 5th floor, New York, NY, 10017, Ahnjo6@nyumc.org



Family and Community Medicine Research Tenure Track

Faculty Positions Penn State Health Milton S. Hershey Medical Center/Penn State College of Medicine Hershey, PA

The Department of Family and Community Medicine, PennState College of Medicine/Milton S. Hershey Medical Center in Hershey, PA along with The Penn State Cancer Institute (PSCI) Population Health and Cancer Control (PHCC) program is growing our research efforts with the addition of new faculty.

We seek highly motivated researchers with an interest in cancer survivorship research, particularly on models of survivorship care integrating care into community-based primary care settings. We are also interested in Exercise Oncology Researchers or Rehabilitation Scientists (e.g. Physical or Occupational Therapists with a PhD, PhD trained nurses) with an interest in cancer rehabilitation practice and research. Further, the candidates will be expected to work collaboratively with PSCI colleagues to develop a robust survivorship program or cancer rehabilitation program for the >5000 individuals diagnosed with cancer who are treated at our institution every year.

The positions are open to physician scientists and doctoral level trained applicants. Tenure track positions are available across all ranks with support package and relocation resources. Joint appointments are available in other relevant units at Penn State Health

INTERESTED CANDIDATES ARE ENCOURAGED TO CONTACT

Mack Ruffin, MD,

Department Chair for Family and Community Medicine
mruffin@pennstatehealth.psu.edu or by phone at **717-531-8187**.

Join a deeply collaborative team on the cutting edge of population health and cancer control, located in the sweetest place on earth!

**Dr. Ruffin is attending the ASPO conference
and welcomes conversations about these positions.**



PennState Health
Milton S. Hershey
Medical Center



PennState
College of Medicine

The Penn State Health Milton S. Hershey Medical Center is committed to affirmative action, equal opportunity and the diversity of its workforce. EOE — M/W/PV/D.

Cancer Prevention Fellowship Program

Application Period: May 1 to August 25, 2018

Fellowships start June 2019



The National Cancer Institute Cancer Prevention Fellowship Program is looking for future leaders in the fields of cancer prevention and control.

Participants in this multidisciplinary, post-doctoral program:

- Have the opportunity to obtain an M.P.H. degree sponsored by NCI, if needed
- Receive scientific and leadership mentoring at NCI/FDA
- Receive competitive stipends, relocation expenses, travel allowances, and more

Criteria:

- Candidates must have a doctoral degree (M.D., Ph.D., or equivalent) or be enrolled in an accredited doctoral degree program.
- Candidates must have no more than 5 years relevant postdoctoral experience.
- Candidates must be a citizen or permanent resident of the United States.

To view the program catalog and apply online: <https://cpfp.cancer.gov>

U.S. Department of Health & Human Services | National Institutes of Health

Computational Genomic Epidemiology of Cancer Postdoctoral Training Program

The **Case Comprehensive Cancer Center at Case Western Reserve University** invites applications to its 2-3 year NCI-funded postdoctoral training program. This program is designed to prepare trainees for careers as independent investigators engaged in research at the intersection of cancer research, genetics, epidemiology, biostatistics and computer science. Cancer researchers obtaining training will have the skills vital to decipher the complex pathways comprising genetic and environmental risk factors for disease, and will ultimately be able to provide clinicians and their patients with valuable information for the prevention and treatment of cancer.

Requirements

- US citizenship or permanent residency.
- Terminal degree (PhD, MD or MD/PhD).
- Demonstrated skills in quantitative analysis and an interest in a career in genetics research.

In employment, as in education, Case Western Reserve University is committed to Equal Opportunity and Diversity. Women, veterans, members of underrepresented minority groups, and individuals with disabilities are encouraged to apply.

For More Information

Visit cancer.case.edu/training/computationalgenomics/
Contact Damian Junk [216.286.9191, damian.junk@case.edu]



CASE
COMPREHENSIVE
CANCER CENTER



Population Sciences Researchers Department of Medicine

Baylor College of Medicine in Houston, Texas is seeking population science researchers for faculty positions at all levels. The individuals will have the opportunity to collaborate with geneticists, biologists, and clinicians in the Cancer Center and its affiliated hospitals (Texas Children's, the Houston VA Medical Center, CHI Baylor St. Luke's Hospital, and Ben Taub Hospital). Collaborations with faculty in health services research at our Center of Excellence at the VA Medical Center and with MD Anderson Cancer Center are encouraged. Current peer reviewed grant funding and relevant publication record are required. The candidate will be expected to develop an independent research program with peer-reviewed funding.

The Dan L Duncan Comprehensive Cancer Center has strong research programs in the basic, population, clinical, and translational sciences. The Center for Precision Environmental Health, Human Genome Sequencing Center, Human Microbiome Center and the Children's Nutrition Research Center at Baylor provide other important resources for collaboration. The Cancer Center is further supported by a broad array of Shared Resources including the Population Sciences Biorepository that provides Biospecimen collection, processing, and storage coupled with clinical and risk factor data collection for a variety of cancers as part of our growing molecular epidemiology program.

To apply, please visit <http://www.bcm.edu/epipop/> and email mbondy@bcm.edu



Sidney Kimmel Cancer Center at Jefferson
Faculty Positions in Cancer Research

The Sidney Kimmel Cancer Center (SKCC) at Jefferson in Philadelphia, Pennsylvania is excited to announce new faculty positions in the areas of **Cancer Population Sciences**, **Applied Health Economics & Outcomes Research**, and **Molecular Epidemiology in Cancer**. Sought are investigators (PhD, ScD, MD, or MD/PhD) with expertise and research related to one or more of the following:

- Risk assessment, molecular & genetic cancer epidemiology, and translating interventions into practice
- Discovering & validating biomarkers of cancer risk, progression, prognosis, treatment, surveillance
- Cancer prevention, control, behavioral intervention, and survivorship
- Bayesian Network Meta-Analysis; Decision analysis; Disease Modeling; Markov Modeling & Microsimulation
- Outcomes research; cancer survivorship; palliative care
- Smoking/tobacco use
- Pharmacoepidemiology
- Neuro-oncology; geriatric oncology
- Academic, healthcare & industry partner collaboration focused on cancer prevention, treatment, &/or disparities

Investigators dedicated to improving the quality of cancer care for diverse populations through research whom have an established track record of grant funding are strongly encouraged to apply.

The Sidney Kimmel Cancer Center (SKCC) is an NCI-designated consortium cancer center that includes researchers from Thomas Jefferson University and Drexel University. The SKCC community outreach and engagement is ranked “exceptional” and has developed a unique transdisciplinary integrated population science mechanism to promote interactions among basic, clinical, and population scientists in the conduct of team science.

Recruited faculty will be provided generous start-up funds, a competitive salary, and modern facilities, along with administrative and infrastructure services. Successful candidates will get access to cancer registries, Precision Medicine Exchange Consortium (PMEC) and the evolving resources of various types of cancer biorepositories developed within the cancer center. There are existing investigators with various experience on genetic/molecular epidemiology, biomarkers, next-generation sequencing, liquid biopsy, single-cell analyses, etc. Successful candidates will have opportunities to mentor medical students, postdoctoral fellows, and population health graduate students from the Jefferson College of Population Science and Drexel University. In addition to membership in the SKCC, primary and secondary faculty appointment(s)/affiliation(s) may be one or more departments/divisions of the Sidney Kimmel Medical College and/or the College of Population Health at Jefferson.

The SKCC at Jefferson is located in the heart of Philadelphia with an abundance of opportunities for professional and social interactions in a vibrant urban cultural science. Jefferson values diversity and encourages applications from women, members of minority groups, LGBTQ individuals, disabled individuals, and veterans.

Inquiries and expressions of interest should be directed to:
Richard Phalunas, EdD, President/CEO
rphalunas@thebrookegroup.us / (304) 594-1890

Local Host Committee Suggestions



Restaurant Suggestions from the Local Host Committee: 42nd Annual Meeting of the American Society of Preventive Oncology

Baked by Melissa

Quick Cupcake Treat
109 E 42nd St, New York, NY 10017
.3 mile walk from the Roosevelt Hotel
Phone: (212) 842-0220
<https://www.bakedbymelissa.com/>
Open Monday-Friday 7 a.m.-Midnight
Saturday-Sunday 9 a.m.-11 p.m.

Flûte Bar

Champagne Bar with mini bites
205 W 54th St, New York, NY 10019
1 mile walk from the Roosevelt Hotel
Phone: (212) 265-5169
<http://www.flutebar.com/location/new-york/>

Osteria del Circo

High-end Italian fare in circus themed setting
120 W 55th St, New York, NY 10019
.9 mile walk from the Roosevelt Hotel
Phone: (212) 265-3636
<http://circonyc.com/>

Freemans Restaurant

American fare in Colonial tavern décor
Freeman Alley, New York, NY 10002
2.8 miles from the Roosevelt Hotel
Phone: (212) 420-0012
<http://freemansrestaurant.com/#home-section>

Hudson Market

303 10th Ave, New York, NY 10001
1.9 miles from the Roosevelt Hotel
Phone: (212) 244-2060
<http://hudsonmarketnyc.com/>

“Nice Dinner” (a bit pricier) options:

The Breslin

Contemporary/ High-end British gastropub
16 W 29th St, New York, NY 10001
(15 minutes from hotel via the 6 train)
Phone: (212) 679-1939
<https://www.thebreslin.com/>

Má Pêche

Asian-influenced new American fare all day
15 W 56th St, New York, NY 10019
(15 minute walk from the Roosevelt Hotel)
Phone: (212) 757-5878
<https://mapeche.momofuku.com/>

Butter Midtown

A diverse American menu & craft cocktails
70 W 45th St, New York, NY 10036
(5 minute walk from the Roosevelt Hotel)
Reservations: opentable.com
Phone: (212) 253-2828
<http://www.butterrestaurant.com/>

Family-style Italian (best for groups):

Carmine's Italian Restaurant - Times Square

Bustling restaurant with enormous portions of traditional Italian dishes served family style
200 W 44th St, New York, NY 10036
(9 minute subway via the S train or 12 minute walk)
Reservations: carminesnyc.com, opentable.com
Phone: (212) 221-3800
<http://www.carminesnyc.com/locations/times-square>

The Smith

Trendy American eats and brunch favorite
956 2nd Ave, New York, NY 10022
(.7 mile/14 minute walk from the Roosevelt Hotel)
Reservations: opentable.com
Phone: (212) 644-2700
<http://thesmithrestaurant.com/location/midtown/>

Local Host Committee Suggestions

Restaurant Suggestions from the Local Host Committee: 42nd Annual Meeting of the American Society of Preventive Oncology

Outstanding bagels:

Ess-a-Bagel

831 3rd Ave, New York, NY 10022
(11 minute walk from the Roosevelt Hotel)
Phone: (212) 980-1010
<http://www.ess-a-bagel.com/>

Other restaurants and suggestions:

Wildair

Sophisticated American fare
142 Orchard St., New York, NY 10002
2.8 miles walk from the Roosevelt Hotel
Phone: (646) 964-5624
www.wildair.nyc

Balthazar

French brasserie
80 Spring St., New York, NY 10012
2.6 miles walk from the Roosevelt Hotel
Phone: (212) 965-1414
www.balthazarny.com

Inakaya

Japanese robata and sushi
231 W. 40th St., New York, NY 10018
0.8 mile walk from the Roosevelt Hotel
Phone: (212) 354-2195
www.inakayany.com

Bubbys

American comfort food
73 Gansevoort St., New York, NY 10014
2.5 miles walk from the Roosevelt Hotel
Phone: (212) 206-6200
www.ubbys.com

The Shakespeare

British gastropub cuisine
24 E. 39th St., New York NY
0.4 mile walk from the Roosevelt Hotel
Phone: (646) 837-6779
www.theshakespearenyc.com

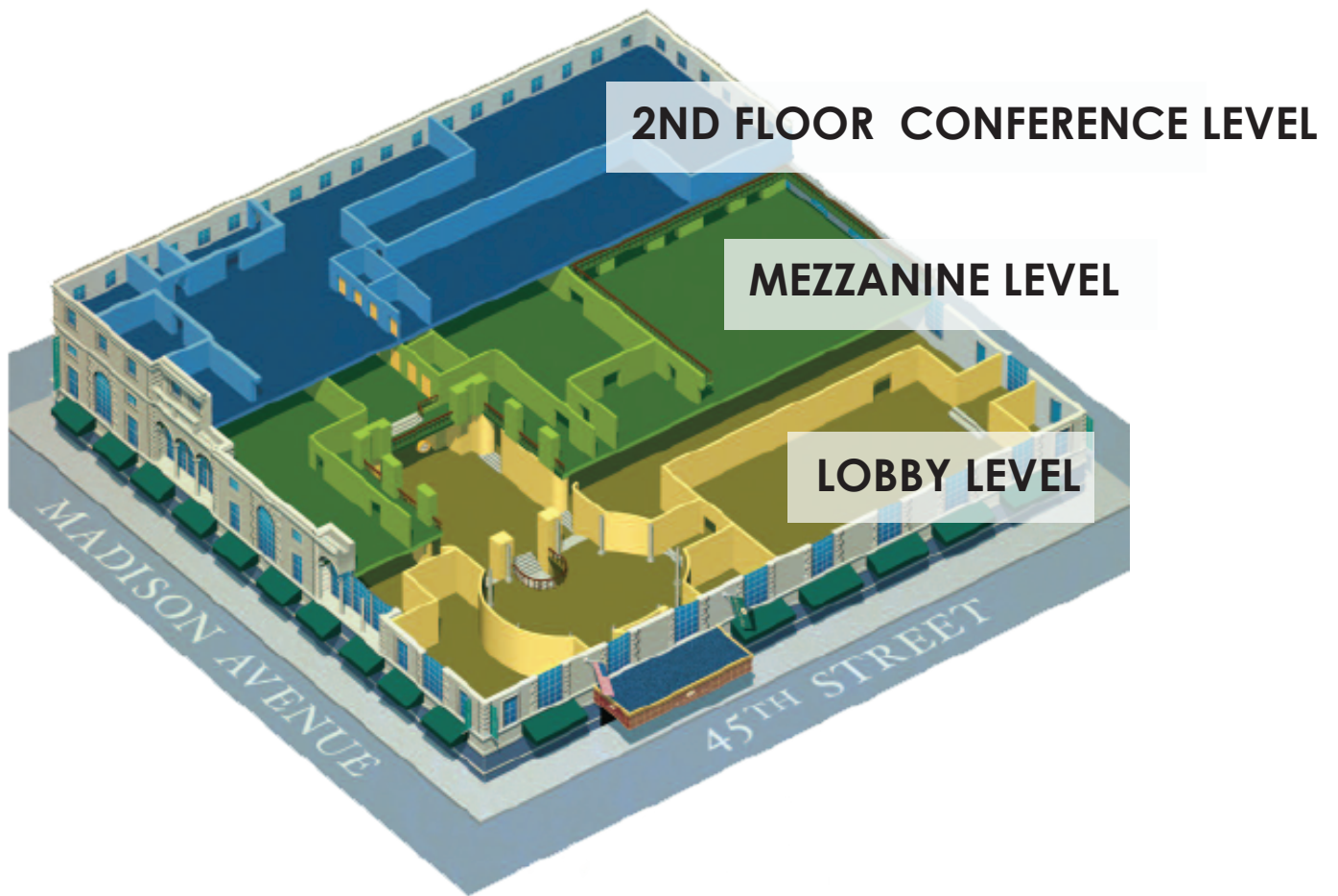
Sullivan Street Bakery

Sweet and savory fresh bakery options
533 W. 47th St., New York, NY 10036
1.2 miles walk from the Roosevelt Hotel
Phone: (212) 265-5580
www.sullivanstreetbakery.com

Little cupcake Café

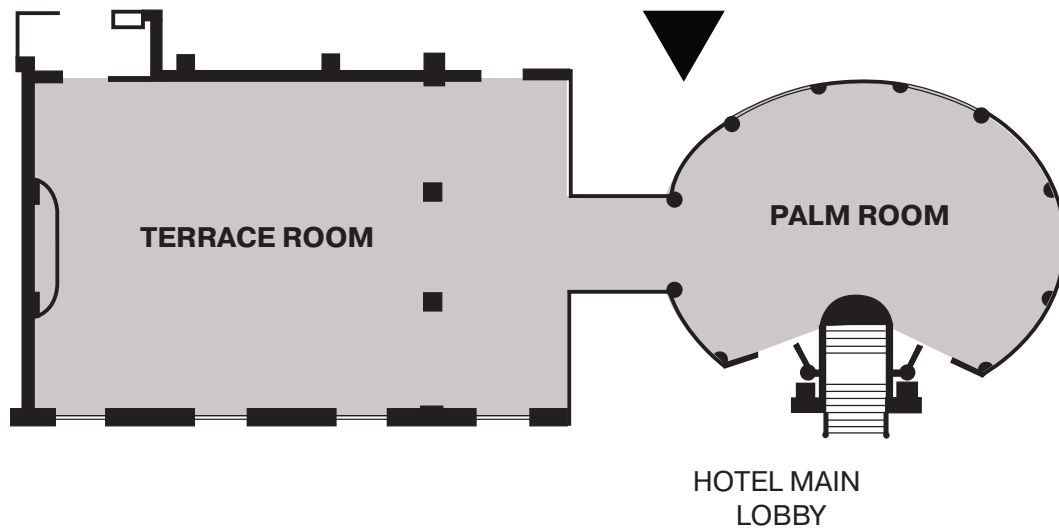
Earth-conscious bakery and posh café
30 Prince St., New York, NY 10012
2.5 miles walk from the Roosevelt Hotel
Phone: (212) 941-9100
www.littlecupcakebakeshop.com

Floor Plan



Lobby Level Event space

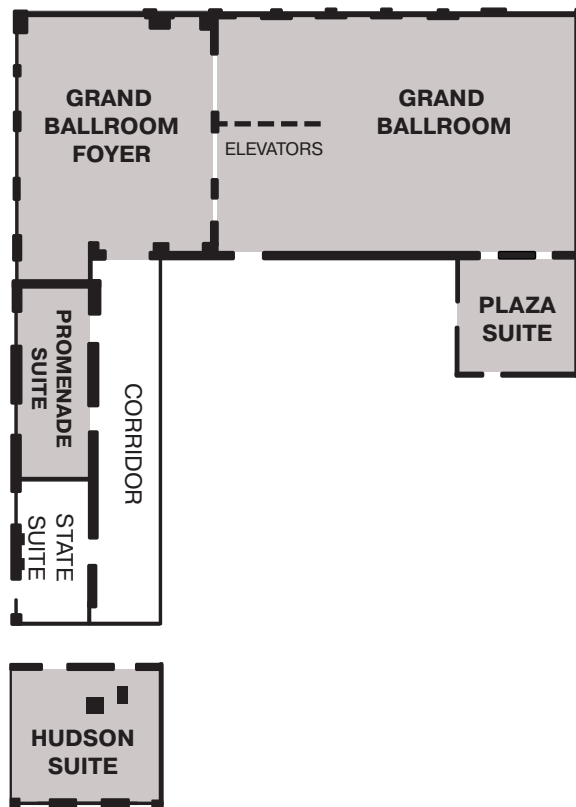
Terrace Room
Palm Room



Floor Plan

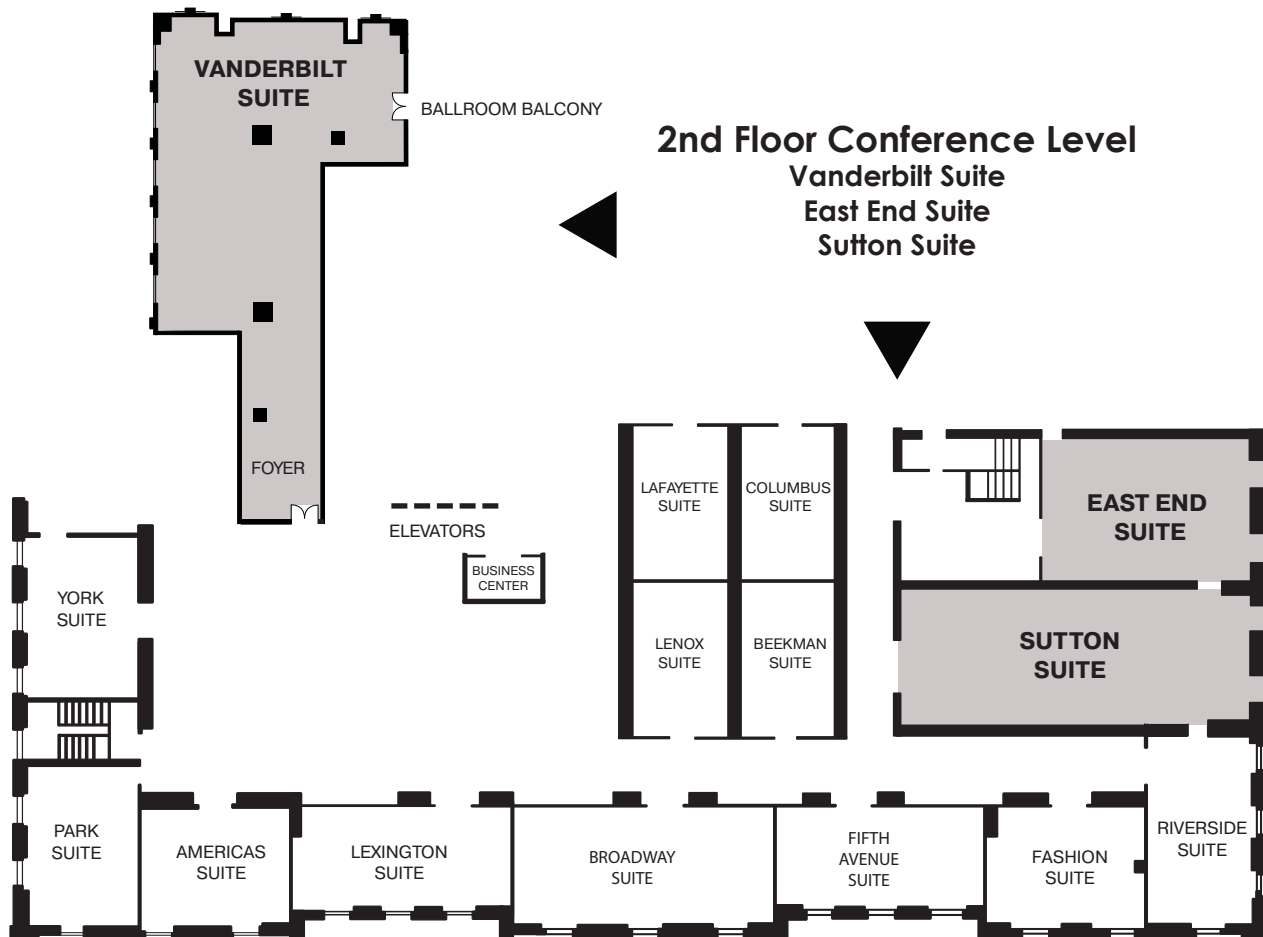
Mezzanine Level Event space

Grand Ballroom
Ballroom Foyer
Promenade Suite
Plaza Suite
Hudson Suite



2nd Floor Conference Level

Vanderbilt Suite
East End Suite
Sutton Suite



At a Glance

Detailed program agenda on pages 11-21

SUNDAY, MARCH 11, 2018

- 1:00 p.m. - 2:15 p.m. Junior Members Session 1: Negotiation: Strategies and Best Practices (Terrace Room)
- 2:30 p.m. - 3:45 p.m. Junior Members Session 2: Industry vs. Academia (Terrace Room)
- 3:00 p.m. - 4:00 p.m. Meeting of NCI R25T& T32 Training Program Principal Investigators (East End Suite)
- 4:10 p.m. - 7:00 p.m. Opening Session of the ASPO General Meeting and Symposium 1: Precision Medicine (Grand Ballroom)
- 7:00 p.m. - 8:00 p.m. **Networking Mixer**(Cash bar and light appetizers) (Ballroom Foyer)
- 8:00 p.m. **Dinner on your own**

MONDAY, MARCH 12, 2018

- 8:00 a.m. - 9:30 a.m. Breakfast Session 1: Behavioral Science & Health Communication (Vanderbilt Suite)
- 8:00 a.m. - 9:30 a.m. Breakfast Session 2: Lifestyle Behaviors, Energy Balance & Chemoprevention (Terrace Room)
- 9:30 a.m. - 10:00 a.m. **Break**
- 10:00 a.m.-11:30 a.m. Symposium 2: Premalignant Conditions and Prevention (Grand Ballroom)
- 11:30 a.m. - Noon ASPO Business Meeting (*Open to all*) (Grand Ballroom)
- Noon - 1:30 p.m. **Lunch on your own**
- 1:30 p.m. - 3:00 p.m. Paper Session 1: Diet, Obesity, and Healthy Living (Grand Ballroom)
- 1:30 p.m. - 3:00 p.m. Paper Session 2: Cancer Screening and Surveillance (Vanderbilt Suite)
- 3:00 p.m. - 3:30 p.m. **Break**
- 3:30 p.m. - 5:00 p.m. Symposium 3: Electronic Health Records in Cancer Prevention (Grand Ballroom)
- 5:00 p.m. - 5:30 p.m. **Break**
- 5:30 p.m. - 7:30 p.m. Poster Session, Reception, and Presentation of Awards (*Cash bar and light appetizers*) (Terrace Room & Palm Room)
- 7:30 p.m. **Dinner on your own**

TUESDAY, MARCH 13, 2018

- 7:45 a.m. - 9:00 a.m. Breakfast Session 1: Early Detection & Risk Prediction (Plaza Suite)
- 7:45 a.m. - 9:00 a.m. Breakfast Session 2: Global Elimination of Cervical Cancer by 2030 (Vanderbilt Suite)
- 9:00 a.m. - 10:00 a.m. ASPO Junior Members (*Open to all*): Career Development Session (Grand Ballroom)
- 9:00 a.m. - 10:00 a.m. Mid- and Senior Faculty Development: Mentoring the Mentor (Promenade Suite)
- 10:00 a.m. - 10:15 a.m. **Break**
- 10:15 a.m. - 11:45 a.m. Symposium 4: Targeting Inflammation for Cancer Prevention (Grand Ballroom)
- 11:45 a.m. - 12:45 p.m. **Lunch on your own**
- 12:45 p.m. - 2:15 p.m. Paper Session 3: Health Disparities in Cancer Prevention (Vanderbilt Suite)
- 12:45 p.m. - 2:15 p.m. Paper Session 4: Molecular Epidemiology and the Environment (Grand Ballroom)
- 2:20 p.m. - 3:30 p.m. Special Closing Session: Securing the Future for Cancer Prevention (Grand Ballroom)
- 3:30 p.m. **Conference Concludes**