

#ASPO2023

AS PO

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Conference Abstracts

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Lung Cancer Yield Among Those Undergoing Lung Cancer Screening in Community-based Healthcare Systems

Burnett-Hartman AN, Rendle KA, Saia C, Greenlee RT, Carroll NM, Honda SA, Hixon BP, Kim RY, Neslund-Dudas C, Oshiro C, Wain K, Ritzwoller DP, Vachani A

Purpose: Lung cancer screening (LCS) via low-dose computed tomography (LDCT) for those with a high risk of lung cancer based on age and smoking history has been recommended in the United States for almost a decade, but performance of LCS in community-based settings is unclear. We aimed to estimate the proportion of those screened who were diagnosed with lung cancer across five healthcare systems in the United States.

Methods: Study participants were LCS-eligible individuals who received care and a baseline LCS LDCT within the five healthcare systems in the Population-based Research to Optimize the Screening Process Lung Consortium (PROSPR-Lung). We collected data on LDCT utilization and results, as well as patient characteristics and smoking history, via electronic health records. LCS LDCT findings were categorized using Lung-RADS [negative (1), benign (2), probably benign (3), or suspicious (4)]. Lung cancer diagnoses occurring within 12 months of a baseline LDCT were ascertained via cancer registry data. Our preliminary analyses, presented here, includes estimates of lung cancer yield, overall, and by Lung-RADS category, among those receiving a baseline LDCT 2014-2018. Data collection through 2021 is underway and final analyses will include data through 2021.

Results: There were 8,682 patients with a baseline scan included in analyses. Of these, 47% were female, 52% were ages 65+, and the ethnic and racial distribution was: 4% Hispanic, 2% Hawaiian/Pacific Islander, 4% Asian, 14% Black, and 74% White. There were 142 (1.6%) patients diagnosed with lung cancer within 12-months of their baseline LDCT. Among those with negative LCS LDCT findings, Lung-RADS 1 (n=1,987) or Lung-RADS 2 (n=5,232), there were 1 and 8 lung cancer diagnoses, respectively. Among those with positive LCS LDCT findings, Lung-RADS 3 (n=906), Lung-RADS 4/4A (n=363), or Lung-RADS 4B/4X (n=194), 10 (1%), 35 (10%), and 88 (45%) were diagnosed with lung cancer, respectively.

Conclusions: The proportion of those diagnosed with lung cancer within 12 months of a baseline LDCT within community settings is similar to clinical trials settings, and use of Lung-RADS categorization in community settings appropriately stratifies patients into those with a low- vs. high-risk of prevalent lung cancer.

Community-Partnered, Multi-Method Assessment of Determinants of Cancer Screening in Immigrant Communities in Brooklyn, New York

Chebli P, Sifuentes S, Charles K, LeCroy M, Foster V, Kranick J, Kwon SC, Trinh-Shevrin C

Purpose. We engaged community representatives from two neighborhoods in New York City (NYC) to understand structural determinants of cancer screening access and to inform neighborhood-specific multilevel strategies to increase cancer screening uptake among immigrant communities in NYC.

Methods. Guided by our Neighborhood Action Councils (NACs), made up of local community organizations, we conducted multi-methods formative assessments to identify structural determinants of cancer screening. Our quantitative community survey assessed cancer risk and social determinants of health with an optional structural racism module, translated into 9 languages to reach understudied populations; we conducted descriptive statistics. Our qualitative assessment consisted of in-language semi-structured interviews with key informants and focus groups with community members (English, Spanish, Haitian Creole, Mandarin, Cantonese); we used inductive content analysis.

Results. We administered the survey in place-based settings with 2,581 respondents (61.9% female; 42.9% Asian; mean age of 44.9 years [SD 17.9]) and completed interviews with 12 key informants and 8 focus groups with 47 community members. Survey findings indicate cancer screening adherence was lower than Healthy People 2030 goals and NYC screening rates (57.4% for colorectal cancer, 51.1% for breast cancer, 57.2% for cervical cancer). Recurrent qualitative themes included poor access to healthcare due to lack of insurance, shortage of culturally competent care, and difficulty navigating the health system. Participants also reported high stress levels due to financial instability, food insecurity, documentation status, and an increased cost of living.

Conclusion. Taken together, our quantitative and qualitative findings clarified health priorities in each neighborhood; cancer risk was linked contextual factors restricting optimal health. We have shared findings with the NACs for co-interpretation of the data and will hold consensus-building activities to co-develop and implement responsive, neighborhood-specific multilevel strategies.

Exploring Sociocultural Influences on Colorectal Cancer Screening among Latino Men: Results from a Multi-State Survey

Camacho-Rivera M, Rogers CR, Rodriguez-Garcia O, Diaz D, Islam JY

Background: The incidence of and mortality from early-onset colorectal cancer (CRC), which occurs in individuals under age 50 years, have been increasing among Latinos. In 2018, the American Cancer Society endorsed a reduction from 50 to 45 years in the recommended age at which average-risk adults should initiate screening.

Methods: We partnered with Qualtrics to recruit a multi-state convenience sample of self-identified Latino men from sources such as targeted email lists and social media. Eligibility criteria include men who: self-identified as Hispanic or Latino, resided in New York, Florida, or Texas, and understood English or Spanish. Survey was fielded from February to March 2022; 1,371 responses collected. Primary exposure was masculinity barriers, measured using validated Masculinity Barriers to Medical Care (MBMC) scale. Additional exposures were two subscales from the Male Role Norms, Attitudes, and Perceptions associated with CRC Screening instrument, as well as Hispanic or Latino ethnicity: (1) Mexican or Mexican American; (2) Cuban; (3) Puerto Rican; (4) Other Hispanic or Latino. Our main outcomes were self-report of CRC screening and fecal immunochemical test. Intention to obtain CRC screening secondary outcome. Preliminary analyses restricted to participants in the 45-59, 60-75 age categories (N = 611).

Results: Among participants, 26% were of Mexican descent, 31% were Puerto Rican, 14% Cuban, 29% other Latino background. Eighty-one percent planned to obtain CRC screening in the future, although only 40% have used a fecal immunochemical test, and 51% have ever had a sigmoidoscopy or colonoscopy. Latino men of other Hispanic ethnicity were more likely to report taking risks with their own health if it benefits their family ($p = 0.018$). Mexican men were least likely to report trust in healthcare professionals ($p=0.002$), and Cuban men were most likely to report receiving quality medical care ($p=0.001$).

Conclusions: Masculinity barriers to medical care may play an important role in screening attitudes, intentions, and behaviors. It is important to understand the roles of intersecting social identities including race, ethnicity, gender identity and norms in reducing colorectal cancer disparities.

Mobilizing Cancer Center-Community Partnerships to Improve Colorectal Cancer Screening among Underserved Populations during COVID-19

Nonzee NJ, Garcia M, Yeung S, Kidambi TD, Idos G, Martinez M, Mikail, Tran K, Gregerson P, Round P, Lee C, Wu P, Chen N, Denq S, Ashing KT

Purpose: As a COVID-19 pandemic back-to-screening initiative, City of Hope partnered with Federally Qualified Health Centers (FQHCs) and community and faith-based organizations to improve colorectal cancer (CRC) screening among ethnically diverse and underserved populations.

Methods: Between October 2020 and October 2022, we implemented a multi-component intervention that included community outreach and education (a multi-ethnic multimedia campaign and community training adapted from the NCI Screen to Save (S2S) program) and clinic-based interventions (provider/staff training and dissemination of in-language patient education and resources). Intervention reach and training participant surveys were assessed. Among our four FQHC partner sites, we also compared clinic-level CRC screening rates among age-eligible patients before (June 2021) and after implementation of the clinic-based intervention component (June 2022).

Results: Our reach assessment showed that our multi-ethnic multimedia campaign reached 35.4 million impressions, our Screen to Save education training reached 300 diverse community members, and our provider/staff training reached 150 medical providers. Among the 100 providers surveyed, >80% felt confident they could get their patients to complete their CRC screening test and follow-up care. For the clinic-based intervention component, our baseline sample included 11,259 age-eligible patients across the four FQHC sites. Overall CRC screening rates increased from 45% to 52% before vs. after the intervention implementation period. The site with the highest CRC screening rate (>62%) maintained steady rates over the observation period, whereas the three sites with lower baseline rates showed greater pre-post improvements (15 percentage-point increase).

Conclusions. Our community-partnered intervention had a broad reach to ethnically diverse and underserved populations. An overall increase in CRC screening rates was achieved across FQHCs, despite clinic staffing challenges during the COVID-19 pandemic. Ongoing intervention implementation assessment will inform sustainability of CRC screening improvements.

A RCT of Two Interventions to Usual Care for Increasing Cervical Cancer Screening

Biederman E, Stump T, Monahan P, Champion V, Paskett E

Purpose: Rural women have increased incidence and mortality from cervical cancer (CC) compared to urban women indicating a lack of cervical cancer screening (CCS), an important component of CC control. The objective of this study was to examine the comparative effectiveness of a mailed DVD vs. DVD plus telephonic patient navigation (PN) vs. Usual Care (UC) for increasing the percentage of rural Midwestern women up to date (UTD) with 2018 United States Preventive Services Task Force CCS guidelines.

Methods: As part of a larger study, 553 women (aged 50-74) who were not UTD for CCS were consented and randomized to one of the three study arms, DVD, DVD+PN, UC. Participants were assessed for baseline characteristics including sociodemographics, health status, and CCS beliefs by self-reported survey. Baseline and 12-month screening status were assessed by medical record review.

Results: The mean age of participants was 59.8 years. When controlling for covariates in a logistic regression model, women had 4.52 (95% Confidence Interval [CI]=2.09,10.7,p<.001) greater odds of being UTD with CCS in the DVD+PN group vs. UC and 2.93 (95%CI=1.63,5.25, p<.001) greater odds of being UTD in the DVD+PN vs. DVD group. Other significant covariates included having higher odds (Odds Ratio[OR]=4.76;95%CI=1.27,.33.33;p=.045) of becoming UTD if on private vs. public insurance; being normal (OR=2.71;95%CI=1.14, 6.37;p=.022) or underweight (OR=2.38;95%CI=1.12,5.09;p=.024) vs. obese; and planning to have a Papanicolaou (Pap) test within the next six months (contemplation) (OR=2.25;95%CI=1.23,4.08;p=.008).

Conclusions: A PN plus an interactive DVD intervention significantly improved the proportion of Midwestern rural women who became UTD with CCS compared to UC. Certain groups of women may be more at risk for not obtaining a CCS such as those who are on public insurance, obese, and not planning CCS. Future interventions should focus on women with these characteristics to increase CCS rates. A limitation of this study is that behavioral variables, such as contemplation, were measured in relation to Pap testing and did not include human papillomavirus (HPV) testing. As HPV testing/co-testing becomes more widely used, future interventions should examine behaviors specific to this screening.

Prevalence of USPSTF Recommended Cancer Screenings Among Individuals Eligible for Lung Cancer Screening: An Analysis of the 2018 Behavioral Risk Factor Surveillance System Survey

Hirsch EA, Zahnd WE, Eberth JM, Studts JL

Introduction: Lung cancer screening (LCS) with low dose CT (LDCT) is the newest cancer screening modality recommended by the United States Preventive Services Task Force (USPSTF), and currently remains largely underutilized with uptake rates <20% among eligible individuals. As LCS continues to be integrated into routine public health practice, it is important to understand the context of cancer screenings among LCS-eligible individuals. The purpose of this study was to quantify rates of USPSTF recommended cancer screenings (lung, colorectal, breast, cervical) among LCS-eligible individuals.

Methods: Data from the 2018 Behavioral Risk Factor Surveillance System survey were used to estimate weighted percentages of being up-to-date with USPSTF recommended cancer screenings among all individuals eligible for LCS using 2013 USPSTF guidelines using the eight states who included the optional LCS module (Delaware, Maine, Maryland, New Jersey, Oklahoma, South Dakota, Texas, West Virginia). Rates were additionally calculated separately for individuals compliant and non-compliant with LCS. Cancer screening eligibility was defined by USPSTF guideline variables available in the BRFSS, and rates were calculated using LCS-eligible subsets that matched screening eligibility (i.e., ages <75 for colorectal and <65 for cervical).

Results: The study sample included 2,793 LCS-eligible individuals. Among these individuals, 16.5% of men and 20.2% of women, reported having a LDCT within the past 12 months. Comparatively, 63.0% of LCS-eligible men were up-to-date for colorectal screening, and 65.9%, 71.7%, and 60.4% of LCS-eligible women were up-to-date on colorectal, breast, and cervical cancer screenings, respectively. Rates of being up-to-date for colorectal, breast, and cervical screenings were universally higher among women compliant with LCS compared to non-compliant with LCS, and significantly greater for colorectal screening among men compliant with LCS compared to non-compliant (84.5% vs. 58.9%, Wald p-value=0.003).

Conclusions: Rates of colorectal, breast, and cervical cancer screenings are higher than LCS among individuals eligible for LCS, highlighting important opportunities to improve LCS and subsequently reducing lung cancer mortality.

A Pilot Intervention Designed to Increase Cruciferous Vegetable Intake to Reduce Bladder Cancer Recurrence and Progression

Yeary KH, Yu H, Wang C, Kuliszewski MG, Li Q, Pratt R, Saad-Harfouche FG, Clark N, DiCarlo E, Wang Z, Tang L

Purpose: Bladder cancer is one of the top 10 most common cancers in the US and is the most expensive cancer to treat. The majority of bladder cancers (70-80%) are diagnosed at early stages as non-muscle invasive bladder cancer (NMIBC), which can be removed surgically. However, 50-80% of NMIBC recurs within 5 years, and 15-30% progresses with poor survival. Current treatment is limited. Preclinical and epidemiologic evidence suggests that dietary isothiocyanates (ITCs) in cruciferous vegetables could be a non-invasive and cost-effective strategy to improve NMIBC prognosis. Thus, the purpose of our study was to develop and pilot test a cruciferous vegetable intervention designed to increase ITC exposure in NMIBC survivors.

Methods: We used a blinded 2-arm randomized controlled trial (RCT) to test the preliminary efficacy of a 6-month cruciferous vegetable intervention for NMIBC survivors. The intervention consisted of mailed materials, a live phone-call to review the materials, and 11 Interactive Voice Responses calls. Three-day urine samples, 3-day dietary recalls, and survey data were collected at baseline and 6-months. Two-sided Wilcoxon rank-sum tests were used for between-group comparisons.

Results: Forty-nine NMIBC patients diagnosed in 2018-2019 were randomized and 42 (22 treatment, 20 control) were retained for 6-month follow-up. Participants were mostly male (71.4%) and White (90.5%), with an average age of 67.4 years. Compared to the control, the treatment group reported 35.0g (95% CI: -14.9, 85.0; $p=0.014$) higher Cruciferae intake (treatment=58.6 +/- 54.5 g vs. control=23.6 +/- 96.1g) and increased urinary ITC levels by 11.1umol/g creatinine (treatment=14.2 +/- 24.5 vs. control=3.1 +/- 13.9, $p=0.027$) at 6-month follow-up.

Conclusion: Our behavioral cruciferous vegetable intervention is the first to significantly increase cruciferous vegetable intake and ITC levels in NMIBC survivors. Our evidence-based dietary intervention has the potential to offer an affordable, scalable option for NMIBC survivors to reduce their risk of recurrence and improve outcomes.

Exercise Improves Chemotherapy-Induced Peripheral Neuropathy Among Women Treated for Ovarian Cancer

Cao A, Cartmel B, Li FY, Gottlieb L, Harrigan M, Ligibel J, Gogoi R, Schwartz PE, Esserman DA, Irwin ML, Ferrucci LM

Purpose: Chemotherapy-induced peripheral neuropathy (CIPN) is one of the most common chemotoxicities and can develop or persist after treatment completion. CIPN is associated with worse physical function and quality of life among ovarian cancer survivors, and at present there is no effective treatment available. In this study, we examined the effect of a six-month aerobic exercise intervention on CIPN among women treated for ovarian cancer in the Women's Activity and Lifestyle Study in Connecticut (WALC).

Methods: Women who completed treatment for ovarian cancer (N=144) were randomized 1:1 to a six-month exercise intervention or attention-control. Women who had received chemotherapy were included in this analysis (N=134). CIPN was measured at baseline and 6-months via the Functional Assessment of Cancer Therapy/Gynecologic Oncology Group-Neurotoxicity self-report questionnaire (score ranges from 0 to 44, with higher scores indicating greater symptoms). We used a mixed-model repeated measures analysis to assess the 6-month change in CIPN between intervention arms.

Results: On average, women were 57.5ff18.4 years old and 1.7ff11.0 years post-diagnosis. Baseline CIPN scores were 8.09ff15.64 and 8.78ff17.91 in the exercise and control arms, respectively ($P=0.56$). The CIPN score was significantly reduced by 1.25 points (95% CI: -2.32 to -0.18) in the exercise arm from baseline to six months, and no change was observed in the attention-control arm (0.39, 95% CI: -0.75 to 1.53). The between group difference was -1.64 points (95% CI: -3.13 to -0.15, $P=0.03$), a decrease of 20.3% in the self-reported CIPN score. The effect was stronger among the 127 patients with CIPN symptoms at study enrollment (-2.02, 95% CI: -3.56 to -0.48; $P=0.01$). Discomfort in feet, joint pain or muscle cramps, and overall weak feeling were the individual components of the self-reported CIPN score that were most improved via the exercise intervention.

Conclusion: A 6-month aerobic exercise intervention significantly improved self-reported CIPN among women treated for ovarian cancer compared to attention-control. While replication in other studies is warranted, exercise could help prevent or attenuate CIPN among women treated for ovarian cancer.

Predictors of Adherence in a Personalized Lung Cancer Exercise Trial: Results from the PEP Study

Bandera VM, Himbert C, Barnes CA, Daniels B, Lundberg K, Boucher K, Mitzman B, Stringham J, Hess R, Kim J, Ligibel JA, Wetter DW, LaStayo PC, Varghese TK, Ulrich CM

Purpose: Exercise interventions have shown benefits for physical function in lung cancer patients undergoing surgery. In this study, predictors of adherence to a pre-/post-surgery home-based, pragmatic, and personalized exercise intervention in lung cancer patients were assessed.

Methods: Patients enrolled in the Precision Exercise Prescription (PEP) Trial and randomized to exercise were included in the analyses. The exercise group participated in a structured, clinic-schedule-aligned, remotely-administered intervention, tailored based on patients' mobility scores (AM-PAC). Weekly Motivation And Problem-Solving (MAPS) calls were conducted for motivational purposes and to discuss barriers, exercise modifications, and self-reported exercise adherence with participants. Notes from MAPS calls were used to classify patients as non- or partially adherent vs fully adherent (exercising >3 days/week) to the intervention from 2 months post-surgery to 5 months. The median adherence score across MAPS calls was utilized. Predictors of adherence at baseline were: clinicodemographic characteristics, 6-minute walk distance (6MWD), AM-PAC scores, and fatigue (FACIT-F). We used descriptive statistics and logistic regression analysis.

Results: N=92 patients in the exercise group were assessed. Of those, 72 completed at least one MAPS call during from two months post-surgery to five months. N=23 patients were fully adherent (67±10 years, 28±4.8 kg/m², 61% female), and N=49 (68%) patients were non-/partially-adherent (62±14 years, 29±5.9 kg/m², 51% female). Fully adherent patients had a greater baseline 6MWD (511±102m vs. 445±136m), lower baseline fatigue (40±7 vs. 35±10), and fewer secondary cancer diagnoses (9% vs. 29%) relative to non-/partially-adherent patients, and were more likely to live in rural communities. Adjusting for age and sex, baseline fatigue [OR1pt:1.07(95%CI:1.01-1.14), p=0.03] and baseline 6MWD [OR1m:1.01(95%CI:1.00-1.01), p=0.01] were statistically significant predictors of adherence.

Conclusions: Adherence to the PEP Study intervention was greater among older, female, and primary lung cancer patients, those living in rural communities, and with lower fatigue, and higher 6MWD at baseline.

Cancer-Related Fatigue Is Associated with Objective Measures of Physical Function in Survivors of Cancer

Marker RJ, Leach HJ

Purpose: Cancer-related fatigue (CRF) is a common and limiting symptom reported by survivors of cancer and may have a negative impact on functional activities. The purpose of this study was to investigate the relationships between CRF and objective measures of physical function in survivors.

Methods: A retrospective analysis was performed on 428 survivors initiating a clinical exercise oncology program. A physical assessment was performed prior to program start and included a six-minute walk test (6MWT), handgrip strength assessment, and a 10 m walk test to measure both usual and fast gait speed. CRF was measured with the Functional Assessment of Chronic Illness Therapy Fatigue scale (FACIT-Fatigue), a commonly used 13-item questionnaire, with scores ranging from 0-52. Lower scores indicate greater CRF. Participant demographics, cancer diagnosis, and treatment information were self-reported at program start. Four multiple linear regression analyses were performed, with 6MWT, handgrip strength, usual gait speed, and fast gait speed as the dependent variables. In each model, FACIT-Fatigue was entered as a predictor and covariates were age, gender, cancer diagnosis, and cancer treatment (currently receiving chemotherapy or radiation or not).

Results: Participants were on average 55.2 (SD=14.1) years old, majority women (64%) and breast cancer survivors (30.5%). Approximately half were currently receiving cancer treatment (48%). The means (SD) of measures of physical function were: 6MWT=582 (120) m; grip strength=32.7 (10.5) kg; usual gait speed=1.36 (0.25) m/s; and fast gait speed=1.9 (0.38) m/s. The mean (SD) FACIT-Fatigue score was 33.7 (10.8). All regression models were significant (p<0.01). FACIT-Fatigue was significantly associated with 6MWT ($\hat{\beta}$ =-3.39, p<0.01), handgrip strength ($\hat{\beta}$ =-0.13, p<0.01), usual gait speed ($\hat{\beta}$ =-0.005, p<0.01), and fast gait speed ($\hat{\beta}$ =-0.009, p<0.01).

Conclusions: Findings demonstrated that higher CRF was significantly associated with reduced performance on objective measures of physical function, providing insight on how CRF may contribute to limitations of functional day-to-day activities. Future studies should investigate whether reductions in CRF mediate the improvements in physical function seen after participation in exercise programs.

Multimorbidity among Adolescent and Young Adult Thyroid Cancer Survivors: A Report from the AYA VOICE Study

Ou JY, Kirchhoff AC, Li J, Abrahão R, Li Q, Kaddas KK, Brunson A, Kushi LH, Chubak J, Keegan TH

Background: Thyroid cancer is one of the most common cancers in adolescents and young adults (AYA, 15 to 39), with excellent 5-year survival of 98%. However, treatments for thyroid cancer such as radioactive iodine and thyroid hormone suppression may increase the risk for multiple late effects (LE). We investigated the incidence of severe LE that cluster in AYA thyroid cancer survivors in a large population-based cohort.

Methods: We used California Cancer Registry records to identify AYAs diagnosed with first primary thyroid cancer during 2006-2018 linked to statewide hospitalization, ambulatory surgery, and emergency department data. Cohort entry began 2 years from diagnosis. Severe LE included cardiovascular, respiratory, endocrine, renal, and liver diseases, and second cancers. Cumulative incidence of each LE, accounting for the competing risk of death, was calculated. Latent class analysis (LCA) identified clustering of LE overall and in <5 and ≥5-year survivors. The number of LE classes was identified by selecting models with the lowest likelihood-ratio G2 statistic, Akaike's Information Criterion, and Bayesian Information Criterion. Probabilities of each LE are presented in each class.

Results: Of 12,224 survivors, 83% were female, 34% were Hispanic, and 62% aged 30-39 years at diagnosis. Mean follow-up time was 7.9 years. Five-year cumulative incidence was highest for endocrine (27.9%, 95% CI 27.0-28.8), respiratory (5.1%, 95% CI 4.6-5.5), and cardiovascular (2.1%, 95% CI 1.8-2.4) diseases. The LCA model identified 3 classes: 78.6% were 'healthy survivors' with a low probability of any LE, 19.8% experienced a high probability of endocrine (95%) conditions, and the remaining 1.6% were 'multimorbidity survivors,' experiencing a high probability of all LEs, particularly endocrine (94%), cardiovascular (61%), renal (55%), and respiratory (46%) conditions, followed by liver disease (25%) and second cancers (9%). No differences were found in the LCA classes among <5 and ≥5-year survivors.

Conclusion: While most survivors of AYA thyroid cancer have few severe LEs, >20% have a high probability of endocrine conditions or multimorbidities. Multidisciplinary survivorship care may be vital to supporting thyroid cancer survivors experiencing multiple LEs.

Red Blood Cell Polyunsaturated Fatty Acid Composition and Mortality Following Breast Cancer: Results from the Women's Healthy Eating and Living (WHEL) Study

Parada H Jr, Wu T, Yang M, Hoh E, Rock CL, Martinez ME

Purpose: To examine the associations between red blood cell (RBC) composition of polyunsaturated fatty acids (PUFAs) and mortality among women with breast cancer.

Methods: This nested case-control study included 1,104 women from the Women's Healthy Eating and Living Study, a randomized controlled trial of a plant-based dietary change on breast cancer survival. Cases were women who died from any cause (n=290) from 1995 to 2006. Controls were women who were alive at the end of follow-up matched to cases on age at diagnosis, years since randomization, intervention group, and stage (n=814). RBC fatty acid composition was measured in blood samples collected at baseline using gas chromatography and included the proportions of four n-3 and seven n-6 PUFAs. We examined each PUFA individually as well as factor analysis-derived factors in association with all-cause and breast cancer-specific mortality using conditional logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs).

Results: In fully-adjusted models, all-cause mortality ORs were elevated among women with PUFAs >median (versus ≤median) for alpha-linolenic acid (ALA, C18:3n3; OR=1.56; 95%CI=1.14-2.14) and for linolenic acid (LnA, C18:2n6, OR=1.54; 95%CI=1.15-2.07), and breast cancer-specific mortality ORs were elevated for LnA (OR=1.72, 95%CI=1.24-2.38) and gamma-linolenic acid (GLA, C18:3n6; OR=1.40; 95%CI=0.97-2.00). Factor 1 [arachidonic acid, C20:4n6; adrenic acid, C22:4n6; and docosapentaenoic acid, C22:5n6] scores >median (versus ≤median) were associated with lower odds of all-cause (OR=0.72; 95%CI=0.53-0.98) and breast cancer-specific (OR=0.67; 95%CI=0.47-0.94) mortality, and Factor 4 [ALA and GLA] scores >median (versus ≤median) were associated with increased odds of breast cancer-specific mortality (OR=1.42; 95%CI=1.01-2.01). Additionally, 1-SD increase in Factor 4 scores were associated with ORs of 1.22 (95%CI=1.04-1.42) for all-cause mortality and 1.24 (95%CI=1.05-1.47) for breast cancer-specific mortality.

Conclusions: RBC PUFA composition profiles are associated with all-cause and breast cancer-specific mortality risk among women with breast cancer.

Ethnic Enclave Residence and Cancer Incidence among Hispanic and Asian American Populations: Do Patterns Differ for Breast, Cervical, or Colorectal Cancer?

Pruitt SL, Canchola AJ, Boscoe FB, Henry KA, Hiatt RA, Hughes AE, Lin K, Meltzer D, Pinheiro PS, Rathod A, Stroup AM, Zhu H, Gomez SL, Shariff-Marco S

Background/Objective: Many Asian American and Hispanic individuals reside in ethnic enclaves. Ethnic enclaves are areas characterized by high prevalence of co-ethnic residents, immigrants, and ethnic-specific businesses. Yet, little is known about cancer incidence in these neighborhoods across the US.

Methods: Using data for breast, cervical, and colorectal (CRC) cancers diagnosed between 2006-2017 among Asian American (n=104,759) and Hispanic (n=234,914) adults in cancer registries from four states (CA, NJ, NY, TX), we calculated age-adjusted incidence rates (AAIR) per 100,000 population and 95% confidence intervals (CI). Asian American and Hispanic enclaves were defined using principal components analysis of four census tract-level variables: percent Asian American or Hispanic of the total population, percent foreign-born Asian American or Hispanic residents, and percent with limited English and percent linguistically isolated for Asian/Pacific Islander languages or Spanish language. We classified enclave score into quintiles and compared AAIR within Q5 (high enclave score; more ethnically and culturally distinct) and Q1 (low enclave score; less ethnically and culturally distinct).

Results: Patterns varied by racial and ethnic group, sex, and cancer type. For Asian American populations, tracts with high Asian American enclave scores demonstrated higher AAIR for breast cancer (Q5=129.3, 95% CI 128.2-130.5 vs. Q1=92.6, 95% CI 76.9-109.7) and higher AAIR for both male and female CRC; but comparable AAIR for cervical cancer. For Hispanic populations, tracts with high Hispanic enclave scores demonstrated lower AAIR for breast cancer (Q5=103.9, 95% CI 103.0-104.7 vs. Q1=163.1, 95% CI 158.9-167.4) and female CRC; higher AAIR for cervical cancer; but comparable AAIR for male CRC.

Conclusions: Greater understanding of the geographic, social, cultural, and behavioral patterns of cancer incidence is critical to inform effective cancer outreach, engagement, and prevention efforts in diverse communities.

Associations Between Political Ideology, Media Use, and COVID-19 Vaccination Among Patients with Cancer

Hathaway CA, Gonzalez BD, Islam JY, Oswald LB, Siegel EM, Tworoger SS

Purpose: COVID-19 vaccination is an important public health measure, especially for patients with cancer who are more likely to experience poor COVID-related outcomes. We evaluated if political ideology and media consumption were associated with COVID-19 vaccination among cancer patients.

Methods: Adults with a cancer diagnosis were asked about COVID-19 vaccination status on six surveys from March 2021-March 2022. Political ideology (liberal; moderate; conservative; prefer not to answer) and media use for COVID-19 information (government websites/healthcare professional/scientific journal; local/national news/TV; local/national radio/newspaper/news websites; social media; other websites; friends/family/neighbors; none/don't follow COVID-19 news) was assessed from January-March 2022. Using multivariable logistic regression models, we estimated odds of COVID-19 vaccination by political ideology or media consumption, adjusting for age, sex, socioeconomic status, race, ethnicity, education, income, marital status, and smoking status.

Results: Among 4,137 patients, 94% were vaccinated. Compared to moderate ideology, liberals had increased odds of vaccination (OR=3.72, 95%CI=1.71-8.12), while conservatives and those who preferred not to answer had lower odds of vaccination (OR=0.32, 95%CI=0.20-0.50; OR=0.40, 95%CI=0.24-0.66, respectively). Compared to those who received their COVID-19 related news from a government website/healthcare professional/scientific journal, those who used other websites or friends/family/neighbors had lower odds of vaccination (OR=0.31, 95%CI=0.22-0.44; OR=0.62, 95%CI=0.42-0.89, respectively). Those who did not follow COVID-19 news had the lowest odds of vaccination (OR=0.12, 95%CI=0.07-0.20). Other sources of COVID-19 news were not associated with vaccination. Medical trust attenuated associations for those with an unknown political ideology or who received COVID-19 news from friends/family/neighbors.

Conclusion: Nearly all cancer patients in this study received at least one COVID-19 vaccine dose. Political ideology and type of news media consumed strongly predicted vaccination, which was partially mediated by medical trust. Public health vaccination campaigns should address medical trust across the political spectrum and news media types.

Insights on Cancer Prevention Research from the 2021 Global Oncology Survey of NCI-Designated Cancer Centers

Garton EM, Eldridge L, Cira MK, Frank A, Duncan K

Purpose: In 2021 the U.S. National Cancer Institute (NCI) Center for Global Health conducted a survey of the 71 NCI-Designated Cancer Centers about their global oncology programs and research projects across the cancer continuum, including cancer prevention. The survey results highlight non-NIH-funded global activities led by the cancer centers and complement data about global oncology research funded by the U.S. National Institutes of Health (NIH). The survey was previously conducted in 2012, 2014, and 2018. This analysis focuses on global cancer prevention research led by cancer centers.

Methods: The NCI designed and fielded an online survey to global oncology contacts and principal investigators (PIs) of research projects from July 2021 through January 2022. Data about NIH grants were sourced from internal systems and the International Cancer Research Partnership database. Analysis was conducted in Microsoft Excel and Python and projects were categorized by Common Scientific Outline (CSO) code by PIs.

Results: Ninety-four percent (67/71) of cancer centers responded to the survey, and 91% of those were involved in global oncology. Cancer centers reported a total of 517 non-NIH funded global oncology projects, 93 of which (18%) had a CSO code of prevention. These projects were led by 32 cancer centers and included research on 37 cancer sites. Cancer centers collaborated with institutions in 59 countries for these projects, including 40 low- and middle-income countries (LMICs). By comparison, when examining NIH-funded grants held by cancer centers with international collaborators in fiscal year 2021, prevention research accounted for 12% of grants.

Conclusions: Prevention research accounts for the lowest proportion by CSO code of NIH-funded global oncology research and second-lowest proportion of NIH grants with international collaborators led by NCI-Designated Cancer Centers, and these proportions have remained stagnant since the previous survey in 2018. Cancer centers are attempting to fill this gap and are conducting more global prevention research with their non-NIH funding than their NIH funds. More support for global cancer prevention research, particularly led by and in collaboration with LMICs, is needed to address the growing global burden of cancer.

County-Level Socioeconomic Status and Rural Disparities in Second Primary Cancer Risk Among Breast Cancer Survivors in the United States

Brandt C, Vo JB, Moore JX, Veiga LHS, Shiels MS, Gierach GL, Berrington de González A, Ramin C

Purpose: Breast cancer survivors have an increased risk of second cancers, yet little has been reported on county-level socioeconomic and rural disparities for second cancer risk among breast cancer survivors.

Methods: We identified 721,957 women diagnosed with a first primary invasive (localized/regional) breast cancer who survived ≥ 1 year in the Surveillance, Epidemiology, and End Results 17 registries (2000-2018). We calculated standardized incidence ratios (SIRs; observed/expected) for all invasive second primary cancers (including breast), all invasive second primary non-breast cancers, and obesity-, smoking-, and alcohol-associated second primary cancers by county-level socioeconomic status (SES; quintiles of Yost Index: 1-lowest SES, 5-highest SES) and rurality (5-categories of rural-urban continuum codes). SIRs were further stratified by race and ethnicity. Poisson regression was used to test for trend and heterogeneity.

Results: During 6.1 median years of follow-up, 65,954 breast cancer survivors developed a second primary cancer. Overall, breast cancer survivors in the lowest SES and most rural counties had the highest SIRs for second primary cancer (SIR=1.16, 95% CI=1.14-1.18; SIR=1.20, 95% CI=1.16-1.24, respectively). This risk declined with increasing SES (p -trend=0.001) and significantly differed by rurality with lower risk among more urban counties (p -heterogeneity=0.003). Risk of second primary cancer was particularly elevated among non-Latina Asian or Pacific Islander (API), Black, and Latina survivors regardless of county-level SES (SIR range: API=1.33-1.60; Black=1.36-1.48; Latina=1.34-1.55; White=1.04-1.06) and rurality (SIR range: API=1.31-1.73; Black=1.41-1.52; Latina=1.41-1.59; White=1.04-1.13). Patterns of risk were similar but attenuated for second non-breast cancers. SIRs for alcohol-, obesity-, and smoking-associated second primary cancers were highest among survivors living in the lowest SES counties and most rural counties.

Conclusion: Lower socioeconomic status and higher rurality at breast cancer diagnosis were associated with an increased risk of second primary cancer. Future studies examining the role of cancer care and treatment by county-level factors in second primary cancer risk are needed.

Assessing Helicobacter Pylori Infections among Adults from the Navajo Nation

Pete D, Phipps AI, Salama NR, Lampe JW, Wu MC

A substantial burden of stomach cancer continues to be observed in American Indians in the United States (US). The Navajo Nation, the largest American Indian tribe in the Southwestern US, is experiencing a higher incidence of stomach cancer compared to the general population in the region, possibly due to the high prevalence of *Helicobacter pylori* (*H. pylori*) infection, an infectious pathogen that colonizes the stomach and is a major risk factor for stomach cancer. To assess the prevalence, virulence, and risk factors for *H. pylori* infection in Navajo adults, we initiated a cross-sectional study in two geographic areas of the Navajo Nation. Study recruitment occurred from January to October 2021 during the COVID-19 pandemic. Participants were recruited using online and offline platforms, including social media, a study website, newspaper advertisements, flyers, word of mouth, and community outreach. Demographic, health, behavioral, environmental, and diet factors were assessed from health and food frequency questionnaires. *H. pylori* infection and *cagA* virulence were detected from stool samples by droplet digital PCR. Of 99 participants recruited, 56.6% (95% CI: 46.2-66.5) of participants were infected with *H. pylori* and, among *H. pylori*-infected participants, 78.6% (95% CI: 65.6-88.4) were infected with a *cagA*-positive *H. pylori* strain. Having a history of *H. pylori* infection was inversely associated with *H. pylori* infection (OR=0.05, 95% CI: 0.01-0.34, $p=0.005$), and using Navajo herbal medicine once a month was positively associated with *H. pylori* infection (OR=7.28, 95% CI: 1.40-61.12, $p=0.03$). No significant associations were observed with other risk factors (e.g., older age, males, lower education levels, smoking, alcohol use, and high sodium intake). The prevalence of *H. pylori* infection was two times higher in adults in the Navajo ABID study compared to the US population (27% seroprevalence), and the prevalence of the *cagA* gene in *H. pylori*-infected participants was four times higher than the US population *cagA* gene prevalence in White people (19% seroprevalence). These findings provide a greater understanding of the burden of *H. pylori* and *cagA*-positive infections and can inform prevention strategies to reduce *H. pylori* infections in the Navajo Nat

End of Life Care Quality for American Indian Patients with Cancer in North Carolina

Emerson MA, Bradford JE, Spees L, Baggett CD, Bell RA, Akinyemiju T, Salas A, Morris H, Wheeler SB

Purpose: American Indians (AI) experience significant disparities in access to timely cancer screening and curative intent treatment leading to worse cancer mortality; however, little is known about the quality of end-of-life (EOL) care in AI patients with cancer. Thus, we sought to describe EOL care in a large population-based cohort of AIs with cancer.

Methods: We retrospectively analyzed EOL care for decedents who were diagnosed with any cancer in 2003 through 2018 in using the University of North Carolina's Cancer Information and Population Health Resource (CIPHR) which includes statewide cancer registry data linked to public and private health insurance claims. Eligible decedents included those with insurance coverage during the month of and before death. Measures of EOL care quality included hospice use in the last 30 days of life as well as existing measures of poor-quality EOL care—intravenous chemotherapy, hospital admission, ICU admission, and >1 emergency department (ED) visit in the last 30 days of life, hospice initiation in the last 3 days of life, and in-hospital death. Associations between patient race (AI vs. White) and EOL care were examined, adjusting for age, sex, health insurance, and rurality.

Results: We identified 167,482 decedents in the CIPHR cohort (1,812 AI and 165,670 White individuals). AI patients had greater proportions of rural residence (54.0% vs. 30.3%) and Medicaid (60.0% AI vs. 27.8%) than White patients. Compared with White patients, AI patients had increased hospital admission (adjusted risk ratio [aRR], 1.12, 95% confidence interval [CI], 1.07-1.16), ICU admission (aRR, 1.22; 95% CI, 1.11-1.34), and >1 ED visit (aRR, 1.36; 95% CI, 1.24-1.49) in the last 30 days of life. Other factors associated with low-quality EOL care included younger age, Medicaid, and rurality.

Conclusions: AI patients and patients with Medicaid and rural residence experienced more aggressive EOL care, suggesting opportunities to optimize high-quality culturally appropriate EOL care in these groups. Better understanding of the unique and complicated physician/patient decision making around EOL care is needed, particularly for AI and other medically underserved patients who may lack insurance and access to consistent, high quality medical care.

Diet Quality and Fecal Bile Acid Composition

Oliveira ML, Abuzer M, Wolf P, Cares K, Grippo P, Mutlu E, Gaskins HR, Ridlon J, Tussing-Humphreys L

Background: Bile acids (BAs) are steroid metabolites generated by the liver from cholesterol. Their function is to support digestion of dietary fat, cholesterol, and fat-soluble vitamins. The gut microbiota metabolizes BAs that escape intestinal reabsorption to secondary BAs and other metabolites that are linked to increased risk of diseases including colorectal cancer (CRC). Diet plays a major role in BA metabolism and may be an important target for optimizing host-microbial BA metabolism for cancer prevention.

Purpose: To examine fecal BA metabolites in relation to diet quality (Healthy Eating Index-2015, HEI-2015) among urban middle to older age adults.

Methods: 135 participants were recruited from two academic medical centers. Stool, two 24-hour diet recalls, anthropometrics, and survey data were collected. Fecal BA profiling was completed using LC/MS. Diet quality was calculated using USDA's HEI-2015. Descriptive and inferential statistics were conducted.

Results: Participants were 57% female, 51% African/American Black, mean age of 59.6 (ffl6.2) years and mean BMI of 31.4 (ffl6.9) kg/m². Using USDA's cut-point for poor diet quality (HEI-2015 < 51 points), participants with poor diet quality were significantly more likely to be classified with obesity, self-report as African American/Black, report lower educational attainment, have increased secondary BAs, deoxycholic acid (DCA) and lithocholic acid (LCA), and lower 3-oxo-lithocholic acid and iso-allo-deoxycholic acid derivatives. In linear models, HEI-2015 (continuous) was a significant inverse predictor of DCA and LCA when controlling for BMI, race, and education. BMI was a significant positive predictor of DCA and LCA when controlling for HEI-2015, race, education. African American/Black was a significant inverse predictor of 3-oxo-lithocholic acid and iso-allo-deoxycholic acid when controlling for HEI-2015, BMI, and education.

Conclusion: Poor diet quality and elevated BMI is associated with increased secondary BAs that have been linked to increased risk of CRC. Improving diet quality and reducing BMI may optimize host-microbial BA metabolism to prevent disease. African American/Black was an independent predictor of lower anti-inflammatory BA derivatives which warrants further investigation.

Examining the Risk Factor Profile of Early-Onset Endometrial Cancer

Peeri NC, Na NR, Bertrand KA, Setiawan VW, De Vivo I, Guo X, Lipworth LP, Du M

Purpose: Endometrial cancer (EC) incidence is rising the fastest in women <50 years old, mirroring trends in younger individuals for other obesity-related cancers. Understanding the risk factor profile of early-onset EC (EOEC) is crucial to inform public health strategies to combat the rising burden of this disease.

Methods: We pooled data for 25 studies in the Epidemiology of Endometrial Cancer Consortium (8 cohort, 17 case-control). The analytic cohort included 13,846 EC cases and 30,610 controls matched on age, race, and study-appropriate factors. 1,639 cases and 4,087 controls were <50 years old at index date. We used generalized linear mixed model regression to estimate unconditional odds ratios (OR) and 95% confidence intervals (CI) of the association between select risk factors and EC with random effects terms for study site. Analyses were stratified by age (EOEC:<50, late-onset EC [LOEC]:≥50 years) and race, and adjusted for matched factors and covariates.

Results: Associations between most risk factors and EOEC were stronger than those observed with LOEC. Compared with body mass index (BMI; kg/m²) <25, women with BMI ≥35 had a 5.6-fold increased risk of EOEC (OR=5.57;95% CI:4.33,7.16) vs. a 4.7-fold increased risk of LOEC (OR=4.68;95% CI:4.30,5.09,PHet<0.05). Higher BMI was associated with increased EOEC risk across all racial groups. Participants with ≥4 livebirths were at a 69% reduced EOEC risk (OR=0.31;95% CI:0.23,0.42) and a 43% reduced LOEC risk (OR=0.57;95% CI:0.53,0.62,PHet<0.05) compared with nulliparous women. In exploratory race-stratified analyses, White and Asian women with ≥4 live births had a reduced risk of developing EOEC (OR=0.25; 95% CI:0.17,0.36 and OR=0.11;95% CI: 0.02,0.54, respectively, vs nulliparous). While associations between smoking and EOEC were inverse in White women (current vs never OR=0.80;95% CI:0.64,0.99), we observed an unexpected positive association in Black women (OR=2.52;95% CI:1.33,4.78).

Discussion: Modifiable factors may play an especially pronounced role in EOEC; increasing incidence may be driven by changes in modifiable factors such as obesity. As routine EC screening is not recommended in the general population, clinical vigilance and education may be warranted in women of reproductive age with high-risk profiles.

Residential Proximity to Carcinogenic Industrial Air Emissions and Breast Cancer Incidence in a United States-wide Prospective Cohort

Ish JL, Madrigal JM, Pearce JL, Keil AP, Fisher JA, Jones RR, White AJ

Purpose: To evaluate whether residential proximity to air emissions of correlated industrial carcinogens, both singly and in combination, are associated with breast cancer incidence.

Methods: Using the US Environmental Protection Agency's Toxics Release Inventory, we estimated the 10-year annual average air releases of 26 known or probable carcinogens within 3, 5, and 10 km of Sister Study participants' baseline residences (n=50,343, 2003-2009). We used Cox proportional hazards regression to estimate adjusted hazard ratios (HR) and 95% confidence intervals (CI) for the association between ambient concentrations of each individual compound and incident breast cancer. To assess mixtures, we applied an exposure continuum mapping (ECM) framework to identify latent mixture profiles via a self-organizing map and assessed whether these profiles were related to incident breast cancer by estimating a joint exposure-response function with generalized additive models.

Results: During follow-up (mean=11.6 years), 4,282 breast cancer cases were identified. The exposure prevalence for compounds emitted within 3-km of participants' residences varied from <1%-15%. For individual compounds, HRs for the association between quantiles of emission levels and breast cancer were largely null, except for cadmium, vinyl chloride and asbestos (e.g., asbestos 3-km HR>median vs. no exposure=2.61, 95% CI: 1.37-5.09). Our application of ECM identified 49 profiles that explained 79% of the variance in emission patterns observed within 3-km of participant residences. Profiles revealed that relatively high levels of exposure to several compounds were rare (<1%) and most participants resided in locations defined by low emissions patterns. Estimation of a joint exposure-response surface indicated that breast cancer was not significantly related to changing patterns of the composition of emission mixtures (p=0.31).

Conclusions: Preliminary results suggest that breast cancer incidence may be related to emissions of certain individual industrial carcinogens, particularly asbestos. Examination of complex exposure scenarios revealed that high simultaneous exposure to many compounds was rare, and that our identified latent patterns of these emissions were not associated with breast cancer.

Adolescent Physical Activity and Breast Cancer Risk in Young Women: Findings from the ProF-SC Study

Kehm RD, Genkinger JM, MacInnis RJ, John EM, Knight JA, Kurian AW, Colonna SV, Chung WK, Phillips KA, Andrulis IL, Buys SS, Daly MB, Hopper JL, Terry MB

Purpose: The incidence of breast cancer (BC) in young women under age 40 years has increased substantially over time, underscoring the need for a better understanding of early life modifiers of risk. We examined the association of recreational physical activity (RPA) with BC risk before age 40 years, focusing on RPA during the adolescent window of susceptibility.

Methods: We used data from the ProF-SC Study, which is enriched for young women at increased risk for BC. We conducted an ambidirectional cohort analysis that included women, aged ≤ 55 years at baseline, who were enrolled within 5 years of their first primary BC diagnosis or had no history of BC at baseline (n=14,865). Women reported by baseline questionnaire their average levels of moderate and strenuous RPA during adolescence (12-17 years), which we converted to total metabolic equivalents per week (METs-per-week) and categorized into quartiles after adjusting for baseline age. We conducted attained age analyses until 40 years using multivariable Cox proportional hazards regression models adjusted for baseline sociodemographic and lifestyle factors. Follow-up started at age 18 years and ended at age at first invasive BC diagnosis, last follow-up, or 40 years, whichever came first.

Results: There were 1,646 BC diagnoses before age 40 during 30,5594 person-years of follow-up. Being in the highest vs. lowest quartile of adolescent RPA was significantly associated with a 16% reduced risk of BC until age 40 before adjustment for baseline RPA (HR=0.84, 95% CI=0.73-0.97). This association was attenuated and no longer statistically significant after adjustment for baseline RPA (HR=0.89, 95% CI=0.77-1.04). We identified a statistically significant multiplicative interaction between adolescent and baseline RPA (interaction p-value=0.03). A one standard deviation increase in METs-per-week of baseline RPA was associated with a 5% reduced BC risk for women in the 10th percentile of adolescent RPA (HR=0.95, 95% CI=0.90-1.00) and an 11% reduced risk in the 90th percentile (HR=0.89, 95% CI=0.84-0.95).

Conclusions: These findings suggest that adolescent physical activity might reduce breast cancer risk in young women and underscore the importance of maintain or increasing RPA levels across the lifecourse.

Lifetime Body Weight Trajectories and Risk of Kidney Cancer: A Large US Prospective Cohort Study

Deng Z, Hajihosseini M, Moore JX, Khan S, Bondy ML, Chung BI, Langston M

Purpose: This study aimed to investigate kidney cancer risk in relation to the body mass index (BMI) trajectory and cumulative exposure to excess weight.

Methods: We identified several anthropometric metrics to capture the lifetime BMI patterns from the prospective Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial. These measures included BMI at specific ages (age 20 years, 50 years, and age at completing the baseline questionnaire), BMI trajectory from age 20 to baseline, cumulative exposure to overweight/obesity from age 20 to baseline, and weight change during each age span. The BMI trajectory was identified using the latent class trajectory model. The cumulative exposure, which was quantified by weighted years of living with overweight/obesity (WYO), was obtained by summing up the excess BMI (BMI-25, set to 0 when BMI<25) across ages. Cox proportional hazards regression, adjusting for age, sex, randomization arm, race, education, smoking, aspirin use, history of hypertension and diabetes, was conducted to quantify the hazard ratio (HR) and 95% confidence interval (CI) for the association between each anthropometric metric and incident kidney cancer.

Results: During a median follow-up of 11.5 years, incident kidney cancers were diagnosed in 391 men and 223 women. A higher BMI at age 20, 50, and baseline was associated with a greater hazard of kidney cancer. Compared to individuals who retained normal BMI throughout adulthood, an increased hazard of kidney cancer was observed for individuals who progressed from normal BMI to overweight (HR:1.41, 95%CI:1.15,1.73), from normal BMI to obesity (HR:2.02, 95%CI:1.57,2.58), and from overweight to obesity (HR:2.79, 95%CI:1.88,4.13). Compared to individuals who were never overweight (WYO=0), elevated HRs were observed among individuals who experienced low (HR:1.22, 95%CI:0.94,1.57), medium (HR:1.46, 95%CI:1.15,1.87), and high (HR:1.92, 95%CI:1.51,2.43) level of WYO (tertiles of WYO above 0). Weight gain of ≥ 10 kg was positively associated with kidney cancer incidence for each age span.

Conclusions: Being overweight in early adulthood, weight gain in later life, and higher cumulative exposure to excess weight over the lifespan were all associated with increased risk of kidney cancer.

Incident Diabetes by Obesity-Related Cancer Status and Cancer Treatment Type: A Prospective Study Using Electronic Medical Records Data

Winn M, Pauleck S, Viskochil R, Ulrich CM, Post A, Richardson S, Colman H, Hu-Lieskovan S, Litchman M, Playdon MC, Hardikar S.

Background: Diabetes has been associated with an increased risk of the development of multiple cancers, however evidence for development of diabetes after cancer diagnosis is limited.

Methods: Using data on 7,702 cancer patients treated at the Huntsman Cancer Institute, a comprehensive cancer center in Utah, we examined the association of systemic cancer treatments (chemotherapy, immunotherapy, hormone therapy, and corticosteroids) and obesity-related cancer (ORC) status with the development of diabetes after cancer diagnosis. Cox proportional-hazards models adjusting for relevant covariates [age, sex, race, body mass index at cancer diagnosis, and ORC status (in treatment-related models only)] were used to calculate hazard ratios (HR) and 95% confidence intervals (CI). Diabetes, cancer treatments, and cancer sites were identified using ICD codes and tumor histology.

Results: 975(12.7%) cancer patients had incident diabetes (723 type-2 diabetes), and the mean time to diabetes diagnosis was 4.4 years after cancer diagnosis. 35.1% cancer patients received chemotherapy, 11.8% received immunotherapy, 19.5% received hormone therapy, 38.8% received corticosteroids, and 40.8% were diagnosed with an ORC. ORC patients and corticosteroid users had a statistically significant elevated risk of new-onset diabetes [HR(95% CI) =1.43(1.24-1.65) and 1.29(1.13-1.47), respectively] compared to patients with a non-ORC and non-users of corticosteroids. Interestingly, patients who received chemotherapy or hormone therapy had a statistically significant lower risk of new-onset diabetes [HR(95% CI) =0.69(0.60-0.79) and 0.68(0.58-0.81), respectively] compared to patients who did not receive these treatments. Stratified analyses evaluating death as a competing risk factor are ongoing.

Conclusion: We observed statistically significant 1.43-times and 1.29-times increased risk of incident diabetes after cancer diagnosis in ORC patients and corticosteroid users. These results suggest that certain cancer treatments may increase diabetes risk. As monitoring cancer patients for new onset diabetes is currently not a clinical standard, understanding diabetes risk in cancer patients can inform strategies for monitoring cancer patients to prevent diabetes development.

T denotes trainee submission.

Behavioral Science & Health Communication

1-T

Association of Sun Safety Behaviors and Barriers with Sunburn History in College Students

Miller DT, Baccam Z, Harris RB

Purpose: Over five million cases of skin cancer are diagnosed each year in the United States with melanoma being the third most common cancer in young adults. While avoiding excess ultraviolet exposure and sunburns in early adulthood can significantly reduce the risk of skin cancer later in life, the use of sun protection in this group remains low.

Methods: In Fall 2019, an online survey of undergraduate students living on campus at a large southwestern university was conducted to determine the frequency of recent sunburns (defined as self-reported number of sunburns in the past three months) as well as sun protective behaviors, tanning activities, and perceived knowledge of and barriers to sun protection. Results from five Likert scale questions were averaged to generate individual behavior and barrier scores, while three questions were included in perceived knowledge score, and two questions in tanning activities score. Associations for individual questions and summary scores with self-reported recent sunburn, adjusted for skin sensitivity, were evaluated using logistic regression.

Results: Over 46% of 458 students reported at least one sunburn in the past three months and 21% reported having multiple sunburns in that period. Furthermore, 53% reported that they intentionally tanned their skin outdoors occasionally or more frequently, while 6.4% reported using an indoor tanning bed occasionally or more. Recent sunburn history was associated with higher tanning activity scores (adjusted Odds Ratio (aOR)=1.33, $p<0.01$) and with a high agreement with the specific question that tanning was attractive (aOR=1.36, $p<0.01$). Scores for sun protection, barriers, and perceived knowledge were not associated with recent sunburn history. However, recent sunburn history was associated with sun protection in females. Conclusion: History of recent sunburns remains high among these college students. Sunburns are associated with high use of tanning activities and agreement that tanning is attractive. This information can inform targeted intervention programming on the university campus.

2

Associations Between Higher Impulsivity and Cancer Risk Behaviors in a Large, Non-Clinical Adult Population

Shannon J, Spellman P, Johnson-Camacho K, Marriott LK

Purpose: Despite substantial evidence linking behaviors such as smoking, heavy alcohol consumption and low intake of fruits and vegetables to increased risk of cancer, millions of individuals continue to engage in these behaviors. Behavioral interventions frequently apply models of health behavior change, yet, few have accounted for individual personality traits that may impact intervention success. Impulsivity has gained attention as a behavioral construct that could potentially influence intervention success as impulsivity is characterized by a lack of response inhibition and an inability to delay gratification. Yet, little work has examined the association between impulsivity and cancer risk behaviors in a large adult population.

Methods: Impulsivity is commonly measured using the Barrett Impulsivity Scale (BIS), a validated assessment that provides total and subscale scores. We analyzed impulsivity and cancer risk behaviors of participants in the Healthy Oregon Project (HOP), a large cohort of adults who completed the BIS-15. As of May 2022, there were 28,418 unique participants in the HOP cohort, with 7,561 participants who completed the BIS-15, 20,217 who completed lifestyle and behaviors surveys, and 7,378 who completed both sets of metrics and are included in the current analyses.

Results: Participants were largely female (80%) and non-Hispanic White (89%). Mean age was 44 years and impulsivity total scores ranged from 15 to 59 (mean 30.9). After adjusting for age, gender, race-ethnicity and body mass index, behaviors consistent with increased cancer risk, specifically smoking, heavy drinking, higher consumption of meat and higher refined vs. whole grains consumption were significantly associated with higher levels of impulsiveness ($p<0.001$). Whereas behaviors considered to be cancer preventive, specifically physical activity, and fruit and vegetable intake were significantly associated with lower levels of impulsiveness ($p<0.001$).

Conclusion: Impulsivity may be an important construct to consider in behavior change interventions that impact cancer risk.

3

Cannabis Use and Stage at Cancer Diagnosis among Adult Cancer Patients and Survivors in Southern California

Kasiri N, Parada Jr. H, Lemus H, Banegas M, Nodora J, Martinez ME, Strong D, Doran N, McDaniels-Davidson C

Purpose: To examine the association between cancer stage at diagnosis and cannabis use or consideration of use since diagnosis.

Methods: Patients receiving care at UC San Diego Moores Cancer Center between 2018 and 2019 participated in an online survey between March and June of 2022. Of the 5,901 patients invited, 954 provided responses (16.2% response rate), which were weighted. The outcome of interest, cannabis use or consideration of use (binary; Yes-No) was assessed with two self-reported items. The exposure of interest, self-reported cancer stage at diagnosis, was defined as Stage II, Stage III, or Stage IV vs. Stage I (referent) and dichotomized as non-advanced (Stages I/II, referent) or advanced (Stages III/IV). We used logistic regression to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association between the stage at diagnosis and cannabis use, adjusting for potential confounders (age, sex, race/ethnicity, education, employment, and cancer type).

Results: Mean age of respondents was 62.8 years (SD=0.6) and 58.3% identified as female. The majority (57.7%) identified as non-Hispanic White and 15.8% as Hispanic/Latinx. Nearly half (41.6%) of respondents reported cannabis use or considered use since diagnosis, the majority of whom (63.6%) were diagnosed with non-advanced stages. Advanced stage cancer diagnosis was associated with a 60% higher odds of cannabis use or consideration of use [adjusted OR (AOR)=1.60; 95% CI=1.08, 2.37] compared to non-advanced stage cancer. When assessed individually, stage at diagnosis was not statistically significantly associated with cannabis use or consideration [AOR=0.93 (95%CI=0.57-1.50), 1.60 (95%CI=0.97-2.64), and 1.49 (95%CI=0.85-2.63)] for Stage II-IV, respectively, when compared to Stage I.

Discussion: Cancer patients and survivors have an interest in and report use of cannabis during their cancer care. Patients diagnosed at advanced stages of cancer may consider and/or use cannabis more than those diagnosed at non-advanced stages of cancer. Further research is needed to understand the impacts of cannabis use on patients receiving cancer treatment and as a tool to ameliorate side effects, though federal regulations pose challenges.

4

Changes in Behavioral Risk Factors for Cancer during the COVID-19 Pandemic

Dwyer LA, Dent K, O'Connell M, Klein WMP

Purpose: The onset of the COVID-19 pandemic influenced cancer prevention in several ways, including sharp declines in cancer screening and diagnosis. Screening rates have since improved, and efforts are underway to achieve pre-pandemic levels. Less emphasis has been placed on areas of cancer prevention that may be less likely to rebound due to the difficulties inherent in behavior change – including changes to cancer-related behaviors such as diet and physical activity. We conducted a literature review to understand trends in these behaviors during the pandemic.

Methods: Peer-reviewed articles published in English since 2020 were obtained from a PubMed search on alcohol use, cancer survivorship care-seeking, diet, HPV vaccination, obesity, physical activity, sedentary behavior, sleep, tobacco use, alcohol consumption, and UV exposure. The search was inclusive of study types (original studies and secondary analyses), countries, and populations. Of 4851 articles identified, 1354 were included because their abstracts described a study of change in one or more of these cancer-related behaviors.

Results: Of the 839 studies on a single behavior, physical activity (PA) was the most studied (285 articles). 62% of these articles report pandemic-related decreases in PA, and 32% report mixed findings for PA change. This trend was seen for obesity and sedentary behavior, with 91% of the 92 obesity articles finding an increase in obesity and all 12 sedentary behavior articles finding an increase in sitting. Most (89%) articles on HPV vaccination found a decrease. Behavior change patterns were more mixed for sleep, alcohol consumption, diet, and tobacco use. Notably, 38% of articles focused on two or more behaviors. Articles discussed numerous contributors to and moderators of behavior change, including: social connectedness, mental health, changes to employment, transition of schools and workplaces from in-person to remote, and stage of the pandemic.

Conclusions: Behavioral risk factors for cancer changed in important ways during the pandemic, with potentially significant implications for cancer morbidity and mortality. This review highlights opportunities to build a research focus on pandemic-related change in cancer risk behaviors and implications for intervention.

5

Confidence, Beliefs, and Knowledge About Cancer Treatments with Cardiotoxic Effects Among Oncologists

Brandt CH, Gillman AS, Nohria A, Ramin C, Ferrer RA, Klein WM, Streck BP, Vo JB

Purpose: Cardiotoxicity is an unintended consequence of cancer treatments (e.g., chemotherapy, chest radiotherapy) which can lead to decreased quality of life and increased mortality among cancer survivors. Clinical guidelines for monitoring and prevention of cardiotoxicity exist, but whether practice and patient characteristics are associated with oncologists' confidence, beliefs, and knowledge for cancer treatments with potentially adverse cardiotoxic effects is not known.

Methods: We surveyed U.S.-based oncologists who are members of the American Society of Clinical Oncology Research Survey Pool to assess their practice and patient characteristics in relation to their 1) confidence in [1-not at all, 3-very], 2) beliefs about [1- not, 5-very strong], and 3) subjective [1-not at all, 5-extremely familiar] and objective knowledge regarding [0-not, 1- guideline concordant for screening frequency] cardiotoxic cancer treatments using independent linear and logistic regression, adjusted for age, years of clinical experience, and gender.

Results: Oncologists (n=133) who completed the survey had a mean age of 46 years (SD: 10.61) and most practiced in urban (71%) compared to suburban or rural locations. Higher proportions of caring for younger patients <50 years were positively associated with confidence about cardiotoxic effects ($\hat{\rho}^2=0.18$, $p=0.03$). Higher proportions of time spent on direct patient care among oncologists were associated with stronger beliefs that adverse cardiotoxic effects are important when making treatment decisions ($\hat{\rho}^2=0.70$, $p=0.04$). Practicing in suburban locations ($\hat{\rho}^2=0.64$, $p=0.003$), but not rural ($\hat{\rho}^2=0.31$, $p=0.37$), was associated with increased reported familiarity (subjective knowledge) of cardiotoxicity guidelines compared to urban locations; however, there were no differences observed when assessing objective knowledge of guidelines for suburban (odds ratio [OR]=2.10, 95%CI=0.85-5.23) or rural (OR=1.12, 95%CI=0.21-4.79) locations.

Conclusions: Our results demonstrate that some practice and patient characteristics are associated with oncologists' confidence, beliefs, and knowledge about cardiotoxic cancer treatments, highlighting the importance of relevant training on cardiotoxicity guidelines for oncologists.

6

Developing Faith-Based Messaging and Materials for Colorectal Cancer Screening: Application of Boot Camp Translation within the African Methodist Episcopal Church

Thompson JT, Rivelli JS, Johnson CA, Gautom P, Burns M, Schenk D, Levell C, Hayes N, Coronado GD

Purpose: Colorectal cancer (CRC) is the 2nd leading cause of cancer-related death in Black and African American people in the United States. We created culturally appropriate and locally relevant faith-based CRC screening messages and materials for African Methodist Episcopal (AME) church communities in Atlanta, Georgia.

Methods: We used boot camp translation (BCT), a validated community based participatory strategy, to elicit input from AME congregants to 1) develop faith-based CRC screening messages that resonate with the AME community and 2) identify the role of the church in bringing CRC information to the AME community. Eligible participants were members of the AME Atlanta East District churches, ages 45 to 75 years, and willing to participate in one 5-hour in-person meeting and two follow-up video-conferencing calls. The in-person session, conducted in the church sanctuary and fellowship hall, consisted of expert presentations by a national leader on colorectal cancer and screening, a local leader well-versed in barriers to screening and community resources, and a prominent figure within the church clergy. Additionally, we held interactive small group sessions to create messages and identify dissemination methods.

Results: A total of 27 adults participated in the in-person session (17 women and 10 men). Participants preferred CRC screening messages that incorporated faith-based concepts including "honoring God by taking care of one's body" and "choosing faith over fear of screening." Other key themes focused on increasing awareness and knowledge of CRC screening, taking control of one's own health, and sharing personal stories with one's community to reduce stigma and inspire action. Favored dissemination channels within the church were Sunday service, print (e.g., flyers, pamphlets, message cards) distributed at church, and digital materials (e.g., videos) shown during service. Desired community channels included cancer awareness events and social media platforms.

Conclusions: Churches serve as key partners in delivering health information as they are among the most trusted institutions within the Black and African American community. Using BCT, we successfully incorporated participant feedback to create faith-based CRC screening messages and identified appropriate channels for sharing information within the AME community.

7

Examination of Physicians' Perspectives on Compassion and Cultural Humility in End-of-life (EOL) Care Discussions with Cancer Patients

Cardenas V, Tran D, Gonzalez S, Wu N, Meier E, Nodora J

Purpose: This study aimed to identify barriers that impact a physician's ability to effectively conduct difficult end-of-life (EOL) conversations in a compassionate and culturally sensitive manner with diverse cancer patients in an oncology setting.

Methods: Physicians in the UC San Diego Moores Cancer Center were invited to participate in a one-time individual qualitative interview to share their perspectives on EOL discussions, burnout, cultural humility, and other factors that affect their experience and interactions with patients. These confidential interviews utilized a semi-structured guide with open-ended questions and follow-up probes, including when discussions become difficult, what barriers prevent physicians from conducting these conversations empathetically, and their ideas for improving EOL discussions. The interviews were transcribed and coded for thematic analysis. Codes were inputted into Dedoose, a research software designed for qualitative and mixed-methods analyses, and code frequencies were analyzed. This process created a final refinement of codes revealing the most common and recurring themes expressed by participants.

Results: Ten physicians enrolled in the study and completed the interview. Multiple themes surfaced which included: 1) Institutional factors (e.g., structural demands on physician's time), communication difficulties (e.g., language differences), physician fatigue, and the COVID-19 pandemic were examples of barriers that influenced EOL conversations, 2) Specific recommendations were provided by physicians for further education and training, 3) Physicians emphasized the importance of offering patient-centered care that includes loved ones' involvement, 4) Physicians highlighted their own unique approaches they found to enhance EOL conversations, and 5) Recognition of the emotional impact EOL conversations have on physicians.

Conclusions: The results demonstrate the complexities involved in EOL conversations with cancer patients from the perspective of physicians and highlight specific barriers and recommendations for further education and training to increase their effectiveness.

8-T

Examining the Impact of the COVID Pandemic on Cervical Cancer Screening Practices Among Clinicians Practicing in Federally Qualified Health Centers (FQHCs)

Lake PW, Fuzzell LF, Brownstein NC, Fontenot HB, Whitmer A, Michael A, McIntyre M, Vadaparampil ST, Perkins R

Purpose: To understand clinician perceptions of cervical cancer screening during the COVID pandemic and the impact of pandemic staffing changes on screening and abnormal results follow-up in Federally Qualified Health Centers (FQHC).

Methods: Clinicians (n=148) practicing in FQHCs in the US completed a survey assessing current/2021 screening practices vs pre-pandemic (i.e., conducting the same amount/more screening vs. conducting less screening), the impact of COVID-related staffing changes on screening, ability to track abnormal patient results and follow-up (i.e., yes/no), and clinician/practice characteristics. We used descriptive statistics to assess clinician characteristics and outcome variables. Using backwards selection and criterion $p < .10$, separate exact binary logistic regression models examined the association of clinician characteristics (race/ethnicity, age, gender, region, clinician type) with perceived 2021 screening practices and impact of COVID-related staffing changes on screening and follow-up.

Results: Over half of clinicians (56%) were advanced practice professionals (PAs, CNMs, and NPs), 36% were MD/DOs representing 'other' specialties such as family medicine (FM), internal medicine (IM), and pediatric/adolescent medicine specialties, and 8% were MD/DO OB/GYNs. Compared to MD/DO OB/GYNs, those in other MD/DO specialties were less likely to report conducting the same or more screening now/2021 (OR=.15, 95% CI: .003-1.17, $p=.083$), and were more likely to report that COVID-related staffing changes impacted screening and the ability to follow-up with their patients (OR=5.02, CI: 1.02-34.26, $p=.047$).

Conclusions: Clinician specialty may play a role in screening practices and patient care. FM, IM, and peds/adolescent medicine MD/DOs appear to be conducting less screening currently/in 2021 and have experienced greater impacts from COVID related to screening and follow-up. FQHCs care for underserved patients who are at a high risk of developing cervical cancer. Given that clinicians representing various specialties are regularly caring for high-risk patients, it is important to understand differences in screening practices and behaviors so quality improvement initiatives can be developed to improve patient care.

9-T

Exploring Oncologists Telehealth Experiences and Perspectives to Optimize Virtual Care for AYA Cancer Patients and Survivors: Preliminary Key Findings

Costa C, Allicock M, Roth M, Shay LA

Purpose: Healthcare systems pivoted to virtual care during the COVID-19 pandemic, but little is known about oncologist experiences. This study explores oncologists' experiences with telehealth, including how to optimize effective virtual care delivery for AYA cancer survivors.

Methods: Drawing on a convenience sample of 5 oncology providers who work with diverse cancer populations across the US, we invited them to participate in semi-structured interviews. Using a qualitative approach, we completed four interviews from June-August, 2022 via WebEx. One independent reviewer analyzed all transcripts using a deductive coding approach and identified initial themes. The study team reviewed transcript summaries and analyzed initial findings to inform the second phase of the study.

Results: Of the four participants, 3 (75%) were men and all (100%) were white. Two participants were pediatric oncologists, one a medical oncologist, and one a physician assistant. Years in practice ranged from six to 16. Prior to COVID-19, providers used telehealth very little, but most reported continued use of virtual care for AYAs. Common positive telehealth experiences included improved patient access to care, opportunity to include family members at visits, and the ability to obtain insight into AYAs home environments. Prominent telehealth challenges were patient difficulties in accessing the virtual platform, coordinating in-person visits and telehealth visits into clinic workflow, and lack of technical infrastructure to support telehealth use in practice. Most providers perceived survivorship care visits to be well-suited for telehealth but noted limitations in specific visit types such as those that require physical assessments. All providers believed telehealth training would be beneficial for optimizing virtual care for AYAs.

Conclusions: Understanding oncology providers' experiences with telehealth and their perspectives on how to optimize virtual care delivery for AYA cancer survivors is essential for the delivery of high-quality and patient-centered virtual care for AYAs. Findings will help inform guideline development and a provider educational intervention.

10-T

Generating Consensus on Essential Activities in Community Outreach and Engagement Evaluation Plans among National Cancer Institute-Designated Cancer Centers

Thompson JR, Rivera Rivera JN, Brandt HM, Tiro JA, Vadaparampil ST, Vanderpool RC, Wheeler SB, Franklin M, Hull PC

Purpose: Community outreach and engagement (COE) is a fundamental activity of NCI cancer centers. Due to the wide variety of COE activities centers must achieve, the ability to prioritize and evaluate effectiveness of COE efforts is instrumental. This study aims to: 1) identify the range of COE activities among cancer centers; 2) assess relationships among identified activities, including importance and ease to collect; and 3) explore potential measures for evaluating COE activities.

Methods: From May to July 2022, we recruited 58 participants from NCI cancer centers in COE leadership positions. Using concept mapping, a participatory mixed method, we conducted a series of activities, including sorting and rating of ideas, to generate concept maps through multidimensional scaling, hierarchical cluster analysis, and bivariate rating comparisons. We brought the maps to the participants in a series of guided group discussions to identify the most essential COE activities and associated measures.

Results: Participants listed 66 unique COE activities carried out by cancer centers, which grouped into 10 thematic clusters. We compared these clusters to the Cancer Center Support Grant COE merit descriptors; three of the top-rated clusters fell under the merit descriptor on community engagement, while other clusters had items distributed across multiple descriptors. Participants identified several essential areas including: building trust, serving as a bidirectional bridge, forming strategic partnerships, integrating COE into center structure, prioritizing/communicating community needs, informing research to reduce cancer burden/disparities, and training to support outreach efforts. Participants indicated process measures (e.g., number of meetings, outreach events, partners) are more feasible to operationalize as opposed to metrics of impact in community trust, empowerment, and changes in cancer outcomes.

Conclusions: Overall, our novel application of concept mapping distills the vast array of COE activities into 10 thematic areas and advances approaches to conceptualize and evaluate COE activities at NCI cancer centers. These findings provide more thorough and consistent understanding of COE activities and ways to prioritize efforts with limited resources.

11

Human Papillomavirus Vaccine Acceptance Post-COVID-19 Vaccine Release among Alabama Mothers

Daniel CL, Brady K, Burch A, Koskan A, Pierce JY

Purpose: The current study seeks to determine if the release of COVID-19 vaccines (vax) influenced Alabama mothers' attitudes and behaviors regarding HPV vax of their adolescent children.

Methods: We developed and implemented a social media survey in September 2022 among mothers of adolescents ages 9-18, who self-identified as Alabama residents and their child(ren)'s primary medical decision maker. The survey assessed demographics; vax knowledge; vax opinions; mother/child vax history; influences on vax decisions; and how COVID vax release affected other vax opinions. Preliminary data were analyzed using Chi-square and Fischer's exact tests.

Results: Of 245 verified responses, most participants were white (87.9%), non-Hispanic (96.7%), and privately insured (59.5%), with annual household incomes \geq \$61,000 (45.6%). Most mothers were between 34-43 years ($n=81$, 50.3%), Mean child age was 12.7 years (55.3% female). For COVID-19 vax, 44.7% reported their child had received or would receive vax (vs. 54.4% who neither had, nor planned to). Further, 60.8% reported their child either already or planned to have HPV vax (vs. 33.6% reporting no intent). Only 46 (23%) children had received both the HPV and COVID vax; 106 (53%) had received neither. Of mothers, 59.5% had received COVID vax or planned to. Mothers of children unvax against HPV were asked if/how the release of COVID-19 vax affected their likelihood of seeking HPV vax for their children. Of these, 89.0% ($n=161$) reported no change in likelihood ("unchanged"). Among those who reported a change in likelihood ("changed"), 25% ($n=5$) reported an increase vs. 75% ($n=15$) reporting a decrease in likelihood. Child's COVID-19 vax status was significantly associated with having received/planning to HPV vax ($p=0.000$). Further, mother's age was significantly associated with change in intention to seek HPV vax ($p=0.025$).

Conclusions: These findings indicate that COVID-19 vax did not have a significant impact on subsequent HPV vax decision making. Further analyses will explore associations between maternal age and COVID vax behaviors on HPV vax intent. Understanding parents' shifting perceptions and influences is critical to informing future targeted interventional and clinical strategies to improve vaccination rates.

12

Introducing HINTS-SEER: A Dataset of Cancer Survivors from NCI's Health Information National Trends Survey (HINTS)

Blake KD, Murray A, Moser RP, Friedman S, Caporaso A, Davis T, Cantor D, Vanderpool RC

Purpose: The National Cancer Institute's (NCI) Health Information National Trends Survey is a nationally representative survey in which 7-11% of respondents report having been diagnosed with cancer. To increase representation from adult cancer survivors in HINTS, NCI conducted a pilot study to sample survivors from three Surveillance, Epidemiology, and End Results (SEER) program cancer registries.

Methods: Cancer survivors were randomly sampled from the Iowa, New Mexico, and Greater Bay Area (Northern California) SEER registries to complete a modified HINTS 5 Cycle 4 self-administered postal questionnaire. Sampling frames were stratified by time since diagnosis and race/ethnicity, with exclusion of non-malignant tumors and non-melanoma skin cancers.

Results: HINTS-SEER contains survey responses and linked SEER diagnosis data for 1,234 cancer survivors. The overall response rate was 12.6%, and a non-response bias analysis indicated few differences in demographic composition between respondents and the pool of sampled patients in each registry. Most of the sample was 10+ years since diagnosis ($n=722$; 60.22% [weighted]), with 392 respondents being 5 to <10 years since diagnosis (29.59%), and 120 respondents being <5 years since diagnosis (10.19%). Common cancers include male reproductive ($n=304$), female breast ($n=284$), melanoma ($n=119$), and gastrointestinal ($n=106$), among others. Tumors were mostly localized (67.79%), with 22.39% regional, 6.15% distant, and 3.67% unknown. Among almost all survivors in the sample (96%), self-reported cancer site matched the registry cancer diagnosis. There was slightly more error with self-reported age of first cancer diagnosis, wherein 83.49% of the sample had a calculated year of first cancer diagnosis that matched or was within 2 years of the SEER-reported year of cancer diagnosis.

Conclusions: HINTS-SEER data are available from NCI by request and may be used for secondary data analyses to examine a range of social, behavioral, and health care outcomes among the survivor sample. HINTS-SEER can be used to examine the information support needs and health care experiences of cancer survivors, and responses can be compared to those of survivors who completed prior administrations of the HINTS general population survey.

13

Patient-Centered Communication and Quality of Care Among Cancer Survivors: Evidence from HINTS-SEER

Blake KD, Murray A, Caporaso A, Moser RP, Vanderpool RC

Purpose: Patient-centered communication (PCC) is an important component of patient-centered care and seen as a goal for most clinical encounters. Previous research has shown that higher PCC supports shared decision making and disease self-management and is associated with an increase in healthy behaviors, decreased morbidity, and higher quality of life among cancer survivors. We examined PCC and quality of care among cancer survivors from three Surveillance, Epidemiology, and End Results (SEER) program cancer registries.

Methods: Data were drawn from HINTS-SEER (2021), a pilot study conducted by the National Cancer Institute to sample adult cancer survivors for the Health Information National Trends Survey (HINTS) (N=1,234). Survivors were randomly sampled from the Iowa, New Mexico, and Greater Bay Area (Northern California) SEER registries to complete a self-administered HINTS questionnaire. Sampling frames were stratified by time since diagnosis and race/ethnicity; those with only non-malignant tumors and non-melanoma skin cancers were excluded. A 7-item scale assessed patients' past 12-month experience with PCC in the following domains: asking questions, responding to emotions, making decisions, enabling patient self-management, explaining things in an understandable way, spending adequate time, and managing uncertainty. Responses used a 4-point Likert scale (always to never). A PCC score was created by reverse-scoring all items, summing and averaging all scores, and performing a linear transformation. Scores ranged from 0-100, with higher scores reflecting better PCC. Past 12-month quality of care was assessed with one item that had five response options from excellent to poor.

Results: Cancer survivors reported experiencing relatively high PCC (Mean=83.30; SD 18.79) and a majority (97%) reported good (11.83%), very good (42.54%), or excellent (42.63%) quality of care in the past 12 months. Results did not differ by race/ethnicity or time since diagnosis.

Conclusions: Cancer survivors reported relatively high levels of PCC and good to excellent quality of care, indicating that providers recognize the importance of quality PCC to the clinical encounter and long-term care for cancer survivors.

14-T

Lessons Learned from Implementing a Coordinated/Collaborative Care Model for Metastatic Breast Cancer (Project ADAPT)

Han Y, Eggers MR, Peterson LL, Ma CX, Colditz GA, Houston AJ

Purpose: To improve metastatic breast cancer (MBC) care, we adapted a multilevel collaborative care model between academic and referring community oncology practices (ADAPT).

Methods: We adapted core features of Ending Metastatic Breast Cancer for Everyone (EMBRACE) from the Dana Farber Cancer Institute for our local setting using the Dynamic Adaptation Process based on the Exploration, Preparation, Implementation, and Sustainment framework. Siteman Cancer Center (Siteman) partnered with 3 community hospitals in the St. Louis region that covered both rural and urban settings. For the Exploration phase, we recruited 10 female patients with MBC who were referred to Siteman from community hospitals and 11 Siteman breast oncologists to complete surveys assessing acceptability and satisfaction of the current referral process. We summarized quantitative data using descriptive statistics and conducted a content analysis for free response questions. Data from the Exploration phase were used to guide the strategies and surveys for the Preparation and Implementation phases.

Results: During the Exploration phase, patient participants: 1) highlighted the importance of communication between Siteman and community providers; 2) expressed frustration at not knowing clinical trial information before their referral appointment and earlier in their treatment plans; and 3) shared they were not well informed about ancillary services. The Exploration phase data and engagement with our partner sites helped inform our next phases by determining key priorities, evaluating procedures, and identifying areas for improvement. We conducted a soft launch to test the new procedures, modified our approach, and officially launched in November 2022. The ADAPT Coordinator will: 1) provide information on clinical trials that patients may be eligible for; 2) connect Siteman and community providers; and 3) streamline the referral pathway to reduce patient and provider burden.

Conclusions: Using this dynamic adaptation approach, we were able to collect real-time data to be responsive to the processes of each site. During the Implementation phase, our aim is to create a sustainable model that improves patient and provider care coordination across various clinical oncology practice settings.

15-T

Mediation Analysis of Intervention Effects in a Randomized Controlled Trial to Improve Utilization of Cancer Genetic Risk Assessment Among High-risk Cancer Survivors

An J, Lu S, Liu H, Walters ST, Heidt E, Stroup A, Paddock LE, McDougall J, Grumet S, Toppmeyer D, Kinney A

Purpose: In the Genetic Risk Assessment for Cancer Education and Empowerment Project, a theory-guided, multi-component Tailored Counseling and Navigation (TCN) intervention increased cancer genetic risk assessment (CGRA) uptake among female cancer survivors at increased risk of hereditary breast and ovarian cancer (HBOC). To understand the mechanisms underlying the intervention effects, we examined whether TCN exerted effects on CGRA uptake through hypothesized theoretical mediators.

Methods: Geographically and ethnically diverse breast and ovarian cancer survivors were recruited from three statewide cancer registries. Women who were assigned to TCN (n = 212) received an initial phone-based psychoeducation that used principles of motivational interviewing, a follow-up tailored letter, and a navigation phone call. No intervention was delivered to the Usual Care arm (n = 213). All participants completed surveys that assessed theoretical mediators at baseline and 1-month post-intervention. CGRA uptake was assessed at 6 months and verified through medical records. Generalized Structural Equation Modeling was used for mediation analysis.

Results: Compared to Usual Care, TCN directly increased perceived susceptibility ($\hat{\beta}2DE = 0.25$, 95% confidence interval (CI) = 0.076-0.43), self-efficacy ($\hat{\beta}2DE = 0.21$, 95% CI = 0.013-0.42), and knowledge of HBOC ($\hat{\beta}2DE = 0.19$, 95% CI = 0.018-0.36). Increased perceived susceptibility and self-efficacy improved CGRA uptake through strengthened behavioral intention; their indirect effects were $\hat{\beta}2IE = 0.034$, 95% CI = 0.0043-0.11 and $\hat{\beta}2IE = 0.043$, 95% CI = 0.0014-0.14, respectively. Increased knowledge of HBOC improved response efficacy beliefs about CGRA ($\hat{\beta}2DE = 0.21$, 95% CI = 0.066-0.35), which in turn strengthened intentions and CGRA uptake.

Conclusions: These findings supported the hypothesized mediation, indicating that TCN effectively improved the key theoretical intervention targets. Risk communication interventions should stress the increased risk of having a pathogenic variant and the potential benefits of genetic testing and bolster efficacy beliefs and motivation by helping remove barriers to CGRA.

16-T

Patient-Provider Discussions About Alcohol Use Comparing Cancer Survivors and Non-Cancer Controls: Findings from the National Survey on Drug Use and Health

Greene N, Dean C

Background: Alcohol use increases cancer risk. The American Cancer Society recommends abstaining from alcohol for cancer prevention but advises those who do choose to drink should limit their intake to 1 drink a day/2 drinks a day for women/men. Healthcare providers are uniquely positioned to deliver this message to patients. However, it is unclear to what extent healthcare providers screen for and discuss alcohol use with cancer survivors.

Methods: We examined the frequency and content of alcohol screening and patient-provider discussions about alcohol use comparing cancer survivors and non-cancer controls in the 2015-2019 National Survey on Drug Use and Health. We used multivariable Poisson regression with robust variance and complex survey procedures to estimate prevalence ratios adjusted for age, sex, race and ethnicity, sexual orientation identity, socioeconomic status, alcohol use, and health insurance status.

Results: Cancer survivors had 1.06 [95% CI: 1.03-1.08] times the prevalence of alcohol screening, either in person or on a form, in a healthcare setting compared with non-cancer controls. Cancer survivors had 1.07 [95% CI: 1.03-1.10] times the prevalence of having an in-person discussion about alcohol use with a healthcare provider compared with non-cancer controls. Among those who had an in-person alcohol discussion, cancer survivors had 1.05 [95% CI: 1.02-1.08] times the prevalence of being asked how much they drink compared with non-cancer controls. No significant differences between cancer survivors and non-cancer controls were found for 1) being asked about frequency of drinking, 2) being asked about drinking problems, or 3) being advised to cut down on drinking. Among cancer survivors who reported usually consuming 3+ drinks per day in the past 30 days, only 15% [95% CI: 10.8-20.5] reported that a healthcare provider advised them to cut down on their drinking.

Conclusions: Cancer survivors are more likely to be screened for and have in-person discussions with healthcare providers about alcohol use compared with those never diagnosed with cancer. Conversation content, however, is limited. Cancer survivors with higher alcohol use are not receiving important messages about reducing their alcohol use for cancer prevention.

17

Selected Findings from a Randomized Pilot Trial to Test the Feasibility and Acceptability of the Caregiver Oncology Needs Evaluation Tool for Lung Cancer Caregivers

Nightingale, CL, McLouth, LE, Levine, BJ, Miller, DP, Sterba, KR, Dest, A, Farris, MK, Lycan, TW, Yelton, PA, Kirkendall, ES, Tooze, JA, Snavelly, AC, Canzona, MR, Weaver, KE

Purpose: CONNECT (Caregiver Oncology Needs Evaluation Tool) is a web-based intervention that systematically assesses lung cancer caregivers' needs, creates a tailored resource list, and refers caregivers to resources. We tested the feasibility and acceptability of CONNECT among lung cancer caregivers.

Methods: Lung cancer caregivers were randomized to CONNECT or a generic resource list (Standard Care). Caregivers completed assessments pre-randomization (T0), 1-month post- (T1), and 3-months post-CONNECT (T2) and a qualitative interview at study conclusion. We calculated accrual, participation, and retention proportions. Themes pertinent to CONNECT likes/dislikes were identified from qualitative interviews. Caregiver self-reported outcomes including burden, depression, and anxiety were collected at each of the three time points and were analyzed using repeated measures modeling in which time (modeled categorically as 3 time points), intervention group, and the interaction between time and intervention group were included as predictors of the outcomes.

Results: 39 lung cancer caregivers were recruited and randomized (CONNECT, n=20; Standard Care, n=19). Caregivers were on average 61 (SD=9.4) years of age, majority female (72%), Caucasian (87%), and a spouse/partner to the patient (56%). 57% of eligible caregivers approached agreed to participate; 90% were retained at 1-month and 85% were retained at 3-month follow-ups. Caregivers completed CONNECT in the clinic (64%) or at home (36%). 87% reported they would recommend CONNECT for other lung cancer caregivers (13% undecided) and qualitative interviews supported acceptability. Exploratory analyses at 3-months revealed a large treatment effect for improving caregiver burden ($d = 0.8$; higher scores reflect less burden), as well as clinically meaningful and moderate effects for reducing depression ($d = -0.5$) and anxiety ($d = -0.6$).

Conclusions: CONNECT, a low-resource intervention designed with dissemination in mind, is both feasible and acceptable for caregivers of lung cancer patients undergoing treatment and shows promise for improving caregiver burden, depression, and anxiety. A future multi-site trial enrolling a larger sample is needed to determine scalability and test efficacy.

18-T

Stakeholder Beliefs about the Factors Required to Successfully Implement Cancer Prevention Programs for Vietnamese Smokers in the United States

Doan KT, Le TN, Kulkarni S, Businelle M, Kendzor DE, Nguyen A, Bui TC

Purpose: Among Asian populations in the United States (US), the Vietnamese rank second highest in smoking prevalence. However, factors that may facilitate or impede the successful implementation and dissemination (I/D) of smoking treatment programs for the US Vietnamese population are not well known. This qualitative study aims to identify theory-based I/D factors that key stakeholders believe may increase the likelihood of successful smoking treatments and cancer prevention programs.

Methods: Fourteen in-depth interviews via video calls were conducted with 9 US Vietnamese healthcare providers and 5 community leaders across the US. The interviewees were diverse in age, sex, profession, and specialty. Data were analyzed using the Practical, Robust Implementation and Sustainability Model with the aid of the MAXQDA program to identify I/D factors.

Results: Healthcare professionals believed that incorporation of smoking assessment into their clinical process, establishing reciprocal trust, offering incentives for participation, and establishing a program's credibility were essential for successfully enrolling patients into programs. Meanwhile, community leaders suggested that physicians' recommendations and engagement in the programs were important for patient enrollment and enhancing the programs' credibility. Frequently informing patients about their progress and health status, and social support also emerged as critical factors for patient compliance, adherence, and completion of treatment programs. Program adoption and dissemination efforts should incorporate culturally appropriate factors (e.g., the potential effects of peer education or family pressure for not smoking in Vietnamese culture). Finally, smoking cessation programs should include smoking-related cancer prevention content (e.g., provision of cancer screening guidelines) and connect patients to relevant cancer prevention programs.

Conclusions: Overall, physician engagement, social support, cultural tailoring, and coordination with relevant cancer prevention/screening programs are believed to be crucial to a successful I/D of a smoking-cessation program. These findings may be useful for the development of smoking-related cancer prevention programs designed for the US Vietnamese population.

19

The Association of Clinician Characteristics with Perceived Changes in Cervical Cancer Screening and Colposcopy Practice During the COVID-19 Pandemic (March-December 2021)

Fuzzell LF, Brownstein NC, Fontenot HB, Lake P, Whitmer A, Michel A, McIntyre M, Vadaparampil ST, Perkins RB

Purpose: To elucidate factors associated with perceived changes in cervical cancer screening and colposcopy during the COVID-19 pandemic among clinicians and advanced practice professionals who perform cervical cancer screening and abnormal results follow-up.

Methods: Using cross-sectional national surveys, clinicians responded to items about whether they were performing fewer, the same, or more cervical cancer screenings and colposcopies in 2021 compared to pre-pandemic. We used separate binomial logistic regression models to determine factors associated with perceptions of conducting fewer (versus the same or more) screenings, and colposcopies in 2021. We conducted qualitative interviews with a subset of clinicians to further explore pandemic-related changes in screening and colposcopy. Interviews were transcribed and coded using thematic content analysis.

Results: From March-August 2021, 1,251 clinicians completed surveys, including 675 clinicians who performed colposcopy; a sub-set of 55 clinicians completed qualitative interviews from June-December 2021. Over one year into the pandemic, 47% of all clinicians reported they were currently performing fewer cervical cancer screenings than before the pandemic. 44.1% of colposcopists reported fewer colposcopies than pre-pandemic. One-fifth (18.6%) of colposcopists reported performing fewer LEEPs than prior to the pandemic, while 1.3% reported no longer being able to offer LEEP at their facility. Older, non-white, internal medicine and family medicine clinicians (compared to OB-GYNs), and those in community health centers (compared to private practice) had higher odds of reporting reduced cervical cancer screenings. Among colposcopists, males, internal medicine physicians, those at community health centers, and in the South had higher odds of reporting reduced colposcopies. Qualitative interviews highlighted pandemic-related care disruptions and lack of tracking systems.

Conclusions: Reductions in cervical cancer screening and colposcopy among nearly half of clinicians more than one year into the pandemic raise concerns that inadequate screening will lead to increases in preventable cancers. The healthcare workforce should be supported to provide cancer screenings in addition to managing acute care.

20-T

The Hair Tales of Pregnant Women of Color in New York City

Vilfranc CB, Houghton LC, McDonald JA

Exposure to endocrine disrupting chemicals (EDCs), such as phthalates, can have negative fetal and maternal health outcomes, including an increased risk of fetal growth disruption and breast cancer. Notably, women of color are the largest consumers of personal care products, which are a main source of EDC exposure. The Let's Reclaim Our Ancestral Roots (Let's R.O.A.R) Study proposed a behavioral intervention during pregnancy to promote reduced use of phthalate-containing hair care products (HCPs). Here, we conducted a qualitative study through educational sessions and semi-structured focus groups to evaluate the factors that influenced the hair journey and product choices of women of color at various stages of life, including their current pregnancy. Of the 47 individuals who were eligible, consented, and enrolled in the study, 31 participated in an English or Spanish educational session discussing the adverse implications of using phthalate-containing HCPs. In a brief post-session focus group, we gathered feedback on the sessions and learned more about their hair journey. We had the English and Spanish sessions transcribed and reviewed for accuracy. We imported all transcripts into NVivo 12 to manage and analyze the data through thematic analysis and coding. We framed questions to capture the participants' unique hair journeys from birth to current pregnancy and identified two main periods: before gaining agency over their hair care and product choices and after agency. We identified three dominant themes: (1) players of influence, which included individuals or entities that influenced their hair experiences, (2) products, which involved all conversations of hair products, and (3) culture, which discussed the influence of culture on their hair journeys. These three themes intersected with each other and impacted the participants' sense of self differently at each period of the hair journey. The data reveals the importance of intervening prior to participants gaining agency of their hair choices. This study provides context of psychosocial and sociodemographic narratives of identity and culture and will be integral to the successful translation of intervention results.

21-T

Use of Google Trends to Understand State-level Differences in Two-year Mammography Rates: An Ecological Infodemiology Approach

Dharamdasani T, Visaria A

Purpose: To examine the utility of Google Trends (GT) as a surrogate for breast cancer awareness and screening prevalence in U.S. states.

Methods: GT is an online tracking system of Google searches, presented as relative search volumes (RSV) from 0 (lowest) to 100 (highest) that are indirectly corrected for population size and internet access. We obtained state level GT data on search terms related to 'mammography', 'breast cancer', 'breast cancer awareness', 'BRCA testing', and 'breast self-exam' from January 1, 2015 to December 31, 2020. We calculated average RSV by state for all of the included search topics, including non-English terms. The outcome was state level age adjusted breast cancer screening prevalence among adults aged 50-74 years who reported receiving a mammogram within 2 years from the Behavioral Risk Factor Surveillance System (BRFSS) 2020. We calculated the Pearson correlation coefficient between state level GT average RSV and BRFSS state level breast cancer screening prevalence. Additionally, we performed a qualitative analysis of the specific search terms used within the above search topics. Lastly, we categorized average RSV according to its median as low (<67) and high (>=67) and determined its predictive value in correctly identifying whether states met the Healthy People 2020 objective for mammogram prevalence within two years (81.1%).

Results: Mississippi had the highest average breast cancer screening RSV while Nevada had the lowest average RSV. Nine (18%) states met the Healthy People 2020 mammography objective. Average breast cancer screening RSV was significantly associated with 2-year mammography prevalence ($r=0.47$, $p=0.0006$). The most searched inquiries included: 'what is mammogram', 'mammogram age', 'mammogram near me', 'mammogram ultrasound', and 'mammogram cost'. A median RSV threshold resulted in low sensitivity (54.8%) and negative predictive value (26.9%), but high specificity (77.8%) and positive predictive value (92.0%) in detecting states that met the Healthy People 2020 mammography objective.

Conclusion: GT may be a useful real-time epidemiological surveillance tool to supplement state wise estimates of mammogram prevalence, although longitudinal studies are needed to determine its predictive accuracy.

22-T

Which Healthcare Professionals Need Interventions to Improve their HPV Vaccine Recommendations? A Systematic Review

Kong WY, Oh NL, Kennedy KL, Gilkey MB

Purpose: More than one-third (38%) of U.S. adolescents fail to complete the multi-dose human papillomavirus (HPV) vaccine series, placing them at risk of developing future HPV-related cancers. Though receiving a healthcare professional's (HCP) recommendation is a key reason for vaccine uptake, not all HCPs deliver HPV vaccine recommendations. We sought to identify which subgroups of HCPs most need to improve their recommendation practices so as to guide future intervention efforts to strengthen HCP communication about HPV vaccination.

Methods: We followed PRISMA guidelines in conducting a systematic review of quantitative studies published in 2012-2022 on the frequency of HPV vaccine recommendation among HCPs for U.S. adolescents aged 9-17. Two researchers independently reviewed each study title and abstract for eligibility, before screening eligible studies in full text. We abstracted relevant findings from eligible studies and assessed study quality using an existing 24-point index. We excluded qualitative studies, reviews, and non-peer-reviewed literature.

Results: Out of 10,751 initial records, we identified 29 studies that met eligibility criteria (mean quality score=21.6, standard deviation=2.4). Most studies (8 of 11) found that a lower proportion of HCPs in family medicine than pediatrics recommended HPV vaccine to adolescents (difference: -2 to -60 percentage points, all $p<.05$), while the remaining 3 studies observed no difference between these specialties. Some studies also suggested recommendations were less common among HCPs with low versus high HPV vaccine-related knowledge (4 of 6 studies), with versus without vaccine safety concerns (2 of 4 studies), or in rural versus non-rural clinics (3 of 6 studies). Studies consistently observed no association between recommendations and perceptions of vaccine efficacy (4 of 4 studies).

Conclusion: Our review suggests that future interventions to improve HPV recommendation should target HCPs in family medicine and rural areas. Given less frequent recommendations among some HCPs with vaccine concerns and low vaccine-related knowledge, interventions should also emphasize enhancing HCPs' beliefs and knowledge about vaccinating adolescents against HPV.

23-T

Women's Information Needs and Educational Preferences Regarding Lung Cancer Screening

Warner ET, Revette A, Restrepo E, Lathan C

Background: Physicians are less likely to discuss lung cancer screening (LCS) with women and women are less likely to be aware of LCS availability. The objective of this qualitative study was to determine educational needs, patient-provider communication barriers, and preferences for lung cancer and LCS health education among women.

Methods: Eight semi-structured qualitative focus groups were conducted with 28 self-identified women meeting 2020 USPSTF LCS eligibility criteria. Participants were recruited through a large health system, from a community-based lung cancer screening program, and through an online database between October 2020 and March 2021. Remote focus groups were led by a trained moderator via Zoom. Audio recordings were transcribed and analyzed using thematic analysis by investigators.

Results: LCS decision-making influences included: 1) Healthcare provider recommendation; 2) Self-advocacy; 3) Insurance coverage and cost; 4) Family; 5) Interest in early detection. Participants preferred video and print educational materials, available at physician's office or shared by physician, that limit scare tactics, shaming, or lectures about smoking, provide positive messaging, use clear language, with diverse participants and images. Preferred content focused on: 1) Early detection and its benefits; 2) Lung cancer description; 3) Lung cancer statistics and risk factors; 4) Benefits of quitting smoking; 5) Demonstration or explanation of where and how LCS is done; 6) Availability of other tests and potential harms of screening; 7) Insurance coverage and costs.

Conclusion: Women in our study had limited awareness of LCS and their eligibility. They expressed a need for recommendation and support for LCS from their healthcare providers and have addressable information needs about lung cancer and the screening process. Our findings provide new insights about women's experiences with LCS, and information needs and can potentially be used to improve LCS uptake in women and shared decision-making processes.

Cancer Health Disparities

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"Pink Is One of My Least Favorite Colors": Chest/Breast Cancer Experiences of LGBTQ+ Survivors, Support People, and Clinicians

Arthur, EK, Sette, E, Fuller, J, Flora, L, Applegate, J, Suchland, J, Mogilevsky, M, Garrick, J, Klakos, K, Bostick, R, Battle-Fisher, M, Lee, C

Purpose: We aimed to 1) describe the experiences of LGBTQ+ breast/chest cancer survivors and support people (informal caregivers) and 2) examine oncology clinicians' perceptions about LGBTQ+ breast/chest cancer care needs.

Methods: This prospective qualitative study leveraged a community-engaged approach. We collected clinical and sociodemographic data and performed semi-structured interviews with LGBTQ+ breast cancer survivors (n=16), support persons (n=10), and providers (n=20) regarding LGBTQ+ breast/chest oncology care. Interview transcripts were independently coded using NVivo qualitative software and analyzed with grounded theory qualitative analysis to identify emergent themes.

Results: Only 38.5% of survivors disclosed sexual orientation or gender identity to all cancer providers, with a majority (76.9%) indicating that clinic staff did not collect this information at registration. While support persons often felt included in medical decisions (88.9%), only 66.7% reported being very satisfied with medical care overall. Only 7.7% reported that patient education materials reflected people like themselves or their family. Qualitative themes related to the influence of LGBTQ+ identity on care among our survivors and support people were: 1) survivor agency in shared decision making, 2) inclusion of support people in care, 3) sources of breast cancer knowledge, and 4) effects of treatment on sex, gender, the body, and intimate relationships. There was variability in clinician training, experiences, and comfort level in providing LGBTQ+ cancer care across clinical disciplines. Majority (61.5%) of respondents reported confidence treating LGBTQ+ patients, but only (38.5%) report being knowledgeable about transgender health needs, with a majority (92.3%) expressing interest in further education. We found five themes from clinicians related to gaps in care for LGBTQ+ survivors: 1) training in care of LGBTQ+ people, 2) disclosure of patient SOGI, 3) involvement of support person, 4) resources for patients, families, and clinicians, and 5) dating, body image, and sexual function.

Conclusion: This work reinforces the need for clinical education, resources, and interventions for care of LGBTQ+ people with breast/chest cancer.

25-T

A Health Equity Door-Step Approach to Reduce Tobacco Use and Oral Cancer Prevention Among South India's Indigenous Tribal Population

Francis DL

Background: India, after African countries, has the world's second largest tribal population. India is home to approximately half of the world's autochthonous people, making it home to many tribes with interesting and varied origins, customs, and social practices. A number of anthropological studies have documented the health status of the Malayali tribes, but no study on the oral health status of this population has ever been reported in the available literature, so the current study was conducted to assess tobacco use, prevalence of oral cancer, and awareness among Malayali tribes, Yelagiri Hills, Tamil Nadu, India.

Methods: In 2010, a cross section survey among 660 was conducted in the 14 tribal villages of Yelagiri Hills, who had completed 18 years of age, had lived in the area for more than 15 years, were present on the day of the examination, and were willing to participate. A pre-tested questionnaire was used to collect data on demographics and tobacco habits. A single examiner performed an intra-oral examination to determine the Oral Health Status using the WHO Oral Health Surveys - Basic Methods Proforma (1997). The statistical analysis using SPSS version 19, demonstrated a significant prevalence of potential oral malignant lesions and a high rate of tobacco use. The population was followed up at regular intervals next 8 years, the same cohort in 2018 was analysed for tobacco use and oral cancer prevalence and compared.

Results: In 2010, 57.7% of the 660 study population had no formal education. 75% of the study population drank alcohol on a regular basis. Among those who used tobacco, 26% smoked beedi, 10.9% smoked cigarettes, 65% chewed raw tobacco, 18% chewed Hans, and 28% used both smoking and smokeless form of tobacco. The oral cavity examination concluded 39% potentially malignant oral lesions and 3% cancerous growth. In 2018, there was a significant decrease in tobacco use (37%), increased awareness of the health risks of tobacco use among adolescents, decreased potentially malignant oral lesions and oral cancer prevalence among the population.

Conclusion: The Malayali tribes were distinguished by a lack of oral health awareness, deeply ingrained dental beliefs, a high prevalence of tobacco use, and limited access to health services.

26

Abnormal Fecal Test Follow-up for Colorectal Cancer Screening in Federally Qualified Health Centers

Nodora J, Manzo D, Hurst S, James A, Rabin BA, Shen J, Gupta S

Purpose: For colorectal cancer (CRC) screening to improve survival, patients with an abnormal fecal immunochemical test (FIT) must follow-up with a diagnostic colonoscopy. Lack of and delayed diagnostic colonoscopies lead to higher risk of death. In partnership with three San Diego area community health centers (CHCs) we conducted a study to better understand the process of abnormal fecal test follow-up for CRC screening from referral to colonoscopy completion.

Methods: Our mixed-method study included an electronic health record (EHR) abstraction and focus groups with key clinic personnel. EHR data were extracted from CHC databases for FIT patients 50-75 years old between Jan. to Dec. 2021, with a 6-month follow-up period. Focus group discussions based on data findings were conducted with key clinic personnel (e.g., CHC executive team, referral managers, providers) at each CHC to identify contextual factors for abnormal fecal test follow-up. We synthesized findings to identify best practices and barriers for patient referral and colonoscopy completion.

Results: Of the 790 patients who received an abnormal FIT result, 89% were referred to gastroenterology and 26% completed a colonoscopy within 6 months. Among patients with an abnormal FIT result, 2% completed a colonoscopy within 30 days, 9.7% completed within 60 days, 16.4% completed within 90 days, 21.5% completed within 120 days, 24.2% completed within 150 days and 25.8% completed a colonoscopy within 180 days. From focus groups, we learned that colonoscopy completion improved through enhanced case management using patient navigation. Barriers to referral included clinically inappropriate repeat FIT testing, involuntary loss of insurance or becoming uninsured, and absence of standing colonoscopy orders. Perceived barriers to colonoscopy included fear and lack of education about the procedure, transportation issues to appointments, long wait time for specialist appointments, and competing life priorities.

Conclusion: Results revealed suboptimal referral and colonoscopy completion rates. Using clinic champions or navigators may address many of these barriers and improve follow-up rates. Even with these strategies in place, innovations are needed to optimize colonoscopy completion after abnormal FIT.

27-T

Access to Care and Social Support in the Mid-Pandemic: A Population-Based Study of Adolescents and Young Adults with Cancer

Betts AC, Allicock M, Shay LA, Preston SM, Murphy CC

Purpose: Adolescents and young adults with a history of cancer (AYAs) experienced disproportionate disruptions in health care and reported declines in social and emotional support in the early pandemic, before the development of vaccines. We aimed to examine the impact of COVID-19 on access to health care and social and emotional support in a nationally representative sample of AYAs during the mid-pandemic, when vaccines were available.

Methods: We identified 148 AYAs (age 18-39 years) with a history of cancer and 592 age- and sex-matched non-cancer controls from the 2021 population-based National Health Interview Survey (NHIS). We estimated the proportion of AYAs and non-cancer controls reporting disruptions in health care due to the pandemic (delayed getting care, did not get needed care), virtual healthcare visits in the past year, and less social and emotional support than a year ago.

Results: AYAs identified as Asian (1.3%), Hispanic (12.9%), non-Hispanic Black (8.3%), and non-Hispanic White (72.3%). Median age at diagnosis was 25 years (IQR 19-31 years). The most common cancer types were gynecologic (27.3%), melanoma or other skin cancers (22.6%), and lymphomas or leukemias (14.5%). A similar proportion of AYAs and non-cancer controls had ever had COVID-19 (15.3% vs. 15.1%, $p=0.95$). Nearly one in four AYAs delayed care (23.3% vs. 18.0%, $p=0.18$), and one in six did not get needed care (14.9% vs. 12.8%, $p=0.48$) due to the pandemic; however, these disruptions were similar among non-cancer controls. Nearly half of AYAs reported a virtual health care visit in the past year compared to one-third of non-cancer controls (44.9% vs. 34.8%, $p<0.05$). More AYAs than non-cancer controls reported receiving less social and emotional support than a year ago (18.7% vs. 9.4%, $p<0.02$).

Conclusions: Many AYAs—who are at risk for cancer recurrence, progression, and long-term and late effects—delayed or went without needed care because of the pandemic, even in 2021. Unlike their peers without cancer, AYAs continued to experience declining social and emotional support in the mid-pandemic. Interventions to increase social support are critically needed to mitigate the challenges of simultaneously coping with cancer and the pandemic as an adolescent or young adult.

28

Addressing LGBTQ+ Health Inequities: How CreateYourGuide is Reimagining Cancer Screening for Transgender, Non-Binary, and Gender Non-Conforming Communities

Surani A, Ayala A, Caro A, Haile R

Purpose: To utilize a community participatory approach to guide the development of a gender neutral, inclusive cancer screening educational tool for Transgender, Non-Binary, and Gender Non-Conforming (TNBGNC) communities.

Methods: Initially, three focus groups were conducted in August 2019 to identify thoughts, feelings, and experiences of cancer prevention and screening. One focus group included 14 GBQ men of color, aged 50+; a second presented ACS screening guidelines to a group of 13 trans/non binary individuals for feedback on relevance to TNBGNC people; the last included 10 LGBT-identified community outreach organizers. Upon further consultation with community members, an online gender-neutral organ inventory tool, "CreateYourGuide,"_ was conceptualized to meet the need of an affirming, inclusive cancer screening process. In May 2022, a listening session was conducted in collaboration with Trans Lounge at the LA LGBT Center to gather feedback on "CreateYourGuide."_ Four TNBGNC participants provided feedback on the efficacy of "CreateYourGuide" as an affirmative and inclusive cancer screening tool.

Results: The following unmet needs were identified: lack of knowledge regarding impacts of cancer on LGBTQ+ communities, relevant screening recommendations, and barriers in locating LGBTQ+ affirming health care providers. The factors above create barriers to access and perpetuate a lack of urgency around cancer and risk factors within the community. Focus group participants recommended simplifying medical language, including visuals, and incorporating technology in the ACS guidelines. This feedback was used to develop "CreateYourGuide,"_ which, despite critiques, listening session participants cited as an effective tool at empowering patients and improving attitudes around cancer screening.

Conclusion: TNBGNC people are forced to navigate a highly gendered, rigidly binary, and inaccessible medical system that often lacks cultural sensitivity. Relevant and tailored information on cancer risk, prevention, and cancer screening needs to reach the diversity of LGBTQ+ people. In addition, cancer screening guidelines must be reformed at an institutional level to meet the needs of TNBGNC communities and reflect the overall diversity of human experience.

29

An Analysis of Broadband Connectivity and Lung Cancer in the Appalachian Region of the United States

Mancuso AB, Onyeije K, Ahern DK, Gibbons MC, Bartolome B, Vanderpool R, Ellison M

Purpose: To understand if rural and Appalachian counties are more likely to have both lower broadband connectivity and higher lung cancer rates (designated as “double burden”_) and to explore whether there is any preliminary evidence of an independent relationship between broadband connectivity and lung cancer.

Methods: Counties were considered “double burden”_ when their level of broadband connectivity (broadband access or Internet adoption) was below the national average and the lung cancer (incidence or mortality) rate was above the national average, based on the medians. Double burden status in rural and urban Appalachian counties was compared to rural and urban non-Appalachian counties in the 13 states of Appalachia. We used logistic regression to test for differences in double burden status and adjust for Social Determinants of Health and other characteristics.

Results: Mostly or completely rural Appalachian counties had significantly higher odds of being double burden with lower broadband connectivity (broadband access or Internet adoption) and higher lung cancer (incidence or mortality) rate compared to mostly urban, non-Appalachian counties. Rural areas continued to have higher odds of being double burden with broadband access and lung cancer (incidence or mortality) rate after adjusting for county-level factors.

Conclusion: Our findings indicate that rural counties in the Appalachian Region face higher odds of being double burden and are considered priority areas for cross-sector investment, support, and collaboration. We also show an independent relationship between broadband connectivity, lung cancer, and rurality that provides some indication of the individual influence that broadband connectivity may exert on health status. This study builds on increasing evidence that broadband connectivity is a Social Determinant of Health and has implications for broadband policies and approaches to cancer care, including support for the FCC’s policy of bringing affordable, reliable, high-speed broadband to 100 percent of the country.

Disclaimer: We note that the statements expressed in this Abstract are solely those of the C2H Task Force and its authors; they do not necessarily represent the official views of the FCC, NCI or their leadership.

30-T

An Efficient Solution for Gathering and Visualizing Catchment Area Geospatial Data

Burus JT, Park L, McAfee CR, Wilhite NP, Hull PC

Purpose: To provide an efficient way of gathering and visualizing publicly available data at various geographic levels for any cancer center catchment area.

Methods: We constructed programs in Python to access data from various publicly available sources through application programming interfaces, automated data downloads and web scraping. This data was then manipulated into datasets at different geographic levels, and exported as an organized collection of files. Two pathways for turning this data into interactive mapping applications were then constructed: one using ArcGIS Online and one using R Shiny. All code was structured to allow for automation of updates, and generalized for easy adaptation to any cancer center catchment area structured as a set of US counties.

Results: This process resulted in a comprehensive software solution licensed under the name of Cancer InFocus. Cancer InFocus creates a quick, efficient and automatable mechanism for gathering much of the data necessary to characterize the cancer burden in any US geographic area of interest and translating it into simple applications for either internal or external distribution. Cancer InFocus is available through a no-cost licensing agreement with the University of Kentucky. The functionality of Cancer InFocus is maintained and expanded upon by the online community of users who have chosen to adopt this platform.

Conclusions: Gathering and visualizing publicly available data on the cancer burden for a given cancer center catchment area at the county and census tract levels can be performed using modern computer programming techniques. This makes doing an initial assessment of the cancer burden more efficient, allowing greater time to be spent on developing strategic priorities and operationalizing insights. The use of open source tools to perform this task allows for its free dissemination to other institutions looking for a ready-made solution to characterize their catchment area. This also demonstrates the ability to develop efficient solutions for gathering and visualizing geospatial data relevant to other disease fields.

31-T

Aspirin Use and Occurrence of Colorectal Adenoma in Black American Women

Barber LE, Bertrand KA, Sheehy S, White LF, Roy HK, Rosenberg L, Palmer JR, Petrick JL

Purpose: To assess the association between aspirin use and colorectal adenoma among Black women, who are disproportionately burdened by the disease compared to their White counterparts.

Methods: The Black Women's Health Study is a prospective cohort of self-identified Black American women established in 1995. Participants reported regular aspirin use on baseline and follow-up questionnaires. Beginning in 1999, participants reported undergoing a colonoscopy or sigmoidoscopy, the only procedures through which colorectal adenomas can be diagnosed. Multivariable logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI) for associations between aspirin use and colorectal adenoma among 34,397 women who reported at least one colonoscopy or sigmoidoscopy.

Results: From 1997 through 2018, 1,913 women were diagnosed with an adenoma. Compared to non-aspirin users, regular users had a 14% (OR=0.86, 95% CI 0.78-0.95) lower odds of adenoma. The odds of adenoma decreased with increasing duration of aspirin use (≥ 10 years: OR=0.80, 95% CI 0.66-0.96, p-trend=0.01). Initiating aspirin at a younger age was associated with a reduced odds of colorectal adenoma (age <40 years at initiation: OR=0.69, 95% CI 0.55-0.86).

Conclusions: Regular aspirin use was associated with a decreased odds of colorectal adenoma in this study of Black women. These findings support the chemopreventive impact of aspirin on colorectal neoplasia and suggest that aspirin may be a useful prevention strategy among U.S. Black women.

32

Assessing Pacific Islander and Asian American Data Needs for Cancer Health Equity

Lee C, Fifita M, Juhn E, Foo MA, Wong D, Tanjasiri SP

COVID-19 exacerbated the structural racism inherent in data collection and reporting in public health. Building upon the long history of collaboration, centered on reducing cancer health disparities in Pacific Islanders and Asian Americans (PIAA), and as a response to the pandemic, cancer advocates and cancer researchers formed the Southern California Pacific Islander and Asian American Data Equity & Health Policy Collaborative (DEHP). DEHP, led by the

University of California, Irvine, Chao Family Comprehensive Cancer Center, organized a two-prong assessment 1) content analysis of federal and state policy compliance and 2) community assessment on usage and need for race and ethnicity data. The content policy analysis included surveying 35 California (CA) county health departments to capture federal and state data policy compliance, and the community assessment included a snowball sample of 77 PIAA organizations to understand perspectives for racial and ethnic data usage. 6 out of 35 CA county health departments reported compliance with federal and state policies for collecting and reporting of race & ethnicity data. 15 counties relied on secondary data collection sources for analysis and reporting (hospitalizations, U.S. census, state dashboards). The top reasons that PIAA organizations need race and ethnicity data were to apply for funding (79%), health education (73%), and evaluation (67%). Examining barriers to accessing data included Asian & Pacific Islanders were aggregated or put in the "Other" category, race and ethnicity data was not collected, and PIAA organizations didn't have staff or resources to analyze or interpret data. If cancer health equity is to be achieved, information about how health disparities are experienced across racial and ethnic communities is needed. Collecting race and ethnicity data is mandated by federal and state policies, but also challenging because it is not standardized. Public health departments face challenges to collecting primary data, and community organizations face challenges in accessing data. A data equity approach is needed for decision making and resource allocation for cancer research and education.

33

Assessing the Impact of COVID-19 on Staffing for Cancer Screening and Follow Up Services: Preliminary Findings from a Large Federally Qualified Health Center

Lara R, Escaron A, Schneider J, Rivelli J, Ramirez K, Garcia J, Coronado G

We investigated the impact of COVID-19 on staffing for cancer screening and follow up within an urban federally qualified health center (FQHC) that operates 25 clinics and serves more than 250,000 patients across two Southern California counties. We conducted an email survey with clinic leadership to compare variant phase (after Dec 2021) clinic hours to pre-pandemic (Mar 2018) clinic hours. We report by clinic (n=17): # of working days/week as well as the % change in weekly clinic hours. We also conducted in-depth telephone interviews (n=19) with FQHC staff leading programs focused on cancer screening, population health, and patient safety and access to explore COVID-19 effects on care between Spring 2020 to Summer 2022. Interviews were audio-recorded, transcribed, and thematically content analyzed. Prior to COVID-19, clinics were typically open 5 days a week from 9am to 6 pm (range 5 to 7 working days).

By December 2021, clinics reported a 10 to 40% decrease in clinic hours (county 1: 25 to 40% decrease (11 clinics); county 2: 10 to 40% decrease (6 clinics)). Findings from qualitative interviews revealed that early in the pandemic, most staff (clinical and administrative) worked from home due to local and state shutdown protocols. Telehealth was implemented and mostly acute/emergency-based needs were addressed on-site at clinics, with staffing limited by safety practices. Many clinic staff were redeployed to call centers to assist with large call volumes during various pandemic surges or to assist with community-wide COVID testing, and vaccination efforts. Later in the pandemic, COVID-related illness, burn-out, furloughs, and resignations further created staffing shortages. By spring of 2022, in-person care began returning to normal levels, however, staffing levels remained lower than pre-pandemic times, as the FQHC sought to replace staff “lost” during the pandemic. In this large FQHC, clinic hours decreased substantially during COVID-19 pandemic surges due to care suspensions, telehealth use, and staff redeployments. To minimize interruptions in service delivery, FQHC disaster preparedness plans ought to incorporate strategies to retain and support front line clinical staff.

34-T

Assessing the Role of Ethnicity and Nativity in Cervical Cancer Screening Disparities Among Women Living in the U.S.

Amboree TL, Parker SL, Montealegre JR

Purpose: Studies have demonstrated higher cervical cancer incidence and lower cervical cancer screening rates in racial/ethnic minority women and among foreign-born (i.e., immigrant) women. This study aims to describe up-to-date cervical cancer screening status among subgroups defined by ethnicity and nativity.

Methods: Data from the National Health Interview Survey (NHIS) 2019 were analyzed. Included data were from n=9,394 women aged 21-65 years with no history of hysterectomy. Up-to-date cervical cancer screening status was based on the U.S. Preventive Services Task Force guidelines. Ethnicity was dichotomized as Hispanic versus non-Hispanic. Nativity was categorized as U.S.- versus foreign-born based on country of birth. Weighted descriptive statistics and log-linked binomial regression were conducted to assess cervical cancer screening adherence by ethnicity-nativity and other sociodemographic variables (age, education, health insurance, and marital status). Statistical significance was assessed at $p < 0.05$.

Results: The sample was 10.0% foreign-born Hispanic (FBH), 9.0% U.S.-born Hispanic (USBH), 11.4% foreign-born non-Hispanic (FBNH), and 69.6% U.S.-born non-Hispanic (USBNH). The overall up-to-date screening prevalence was 75.4% with USBNH being most up-to-

date (78.4%) followed by USBH women (73.1%), FBNH women (69.8%), and FBH women (65.7%; $p < 0.0001$). In unadjusted models, all ethnicity-nativity subgroups had significantly lower prevalence of up-to-date screening when compared to USBNH women. However, after adjusting for sociodemographic variables, USBH women no longer had a statistically significant difference in screening prevalence while both foreign-born subgroups maintained significantly lower prevalence of screening compared to USBNH women [aPR FBH: 0.93 (95% CI 0.88-0.99) and aPR FBNH: 0.87 (95% CI 0.83-0.90)].

Conclusions: Foreign-born women, regardless of ethnicity, have lower prevalence of up-to-date cervical cancer screening after adjusting for sociodemographic factors. Targeted interventions are needed to increase cervical cancer screening participation among foreign-born women.

35-T

Association of Cervical Cancer Incidence with Screening Rates and Healthcare Access in the US Counties

Garg A, Damgacioglu H, Sonawane K, Deshmukh AA

Purpose: In the United States (US), cervical cancer screening rates remain suboptimal and substantial geographic differences with large variation in screening rates according to the county of residence has been reported. The purpose of this study was to evaluate county-level cervical cancer incidence patterns among US women in association with county-level screening rates and access to primary care.

Methods: We conducted a cross-sectional ecological analysis of 149 continental US counties (2018-2019) from the Surveillance, Epidemiology, and End Results (SEER) 22 data to obtain age-standardized cervical cancer incidence rates per 100,000 persons. County-level healthcare access (primary care physician supply per 100,000 residents) data and age-adjusted screening rates (resident females aged 21-65 years without a history of hysterectomy who reported receiving cervical cancer screening test) were obtained from Health Resources and Services Administration (HRSA) and Population Level Analysis and Community Estimates (PLACES) data respectively. Analysis was conducted using SEER*Stat and SAS Statistical Analysis 9.4 software.

Results: Large variation in cervical cancer incidence was observed with incidence ranging from 17.4 per 100,000 (Wichita, TX) to 3.5 per 100,000 (Utah, UT). Cervical cancer incidence was negatively correlated ($r = -0.26$, $p = 0.001$, 95% CI, -0.41 to -0.11) with cervical cancer screening rate. Additionally, a statistically significant negative correlation ($r = -0.33$, $p < 0.001$, 95% CI, -0.46 to -0.18) was also observed between the cervical cancer incidence and primary care physician availability.

Conclusions: Findings from this study suggest an association between cervical cancer incidence and cervical cancer screening rates and primary care physician supply. Our findings indicate that improving the availability of primary healthcare physicians and cervical cancer screening among women could help in the reduction of cervical cancer.

36-T

Recent Patterns in Cervical Cancer Mortality in the United States: 2013-2019

Garg A, Damgacioglu H, Sonawane K, Deshmukh AA

Purpose: A recent US study (Shahmoradi et al. JAMA [published: November 21st, 2022]) showed a dramatic 2.5% per year rise in cervical cancer incidence among US women aged 30-34 years and plateauing of incidence among 35-54-year-old women beginning since 2013. The purpose of this study was to estimate incidence-based mortality trends for cervical cancer based on age at cancer diagnosis to clarify whether the increase is real or attributed to increased diagnostic scrutiny.

Methods: We used data from the Surveillance Epidemiology End Results (SEER)-17 registries. To evaluate incidence-based (i.e., specific to histology and age at diagnosis) mortality overall and for 30-34-year-old women, we used the incidence-based mortality file that links the SEER-17 cancer incidence file with death certificate information. We identified cervical cancer cases using the International Classification of Diseases for Oncology codes (C53.0 to C53.9) and histology codes (8010 to 8671 and 8940 to 8941). To prevent underestimation of incidence-based mortality rates, we considered diagnoses during 2000-2019 and deaths during 2013-2019. We also estimated observed cervical cancer mortality trends (i.e., according to age at death). Analysis was conducted using SEER*Stat and Joinpoint Regression software.

Results: Overall, the incidence-based mortality rate remained stable from 2013 to 2019 (APC 0.0%; 95% CI, -1.1% to 1.1%). However, when stratified by age at diagnosis, APC of 2.5% per year (95% CI, -1.4% to 6.5%) was observed for incidence-based mortality for age at cancer diagnosis at 30-34 years. Overall, the observed cervical cancer mortality rate declined significantly per year (APC, -1.2%; 95% CI -1.6% to -0.8%). The observed APC for cervical cancer mortality for age at death at 30-34 was 1.0% (95% CI -3.9, 6.2).

Conclusions: The positive annual percentage in incidence-based mortality for 30-34-year-old women that we observed provides supportive evidence to Shahmoradi et al suggesting that the rise in cervical cancer incidence in the US is likely real and not attributable to increased/improved screening. Future research is needed to understand the underlying reasons for the rise in cervical cancer incidence-based mortality rates in the US.

37-T

Association of County-Level Social Context and County-Level, Subtype-Specific Breast Cancer Incidence among Black and White Women

Martin-Giacalone BA, Humble S, Linnenbringer E

Purpose: To assess the association of county-level social context with county-level incidence rates of HR/HER2 (hormone receptor/human epidermal growth factor receptor 2) breast cancer subtype among Black and White women.

Methods: To model county-level social context, we applied exploratory factor analysis to Health Inequality Project data; 2,840 U.S. counties had complete data on 22 variables of interest. Next, we linked the factor data to 2010-2017 Surveillance, Epidemiology, and End Results program county-level, age-adjusted breast cancer incidence rates for females age ≥ 50 years at diagnosis. To determine the association of each social context factor with breast cancer incidence, we performed multivariable linear regression to estimate effect sizes ($\hat{\beta}$) and P values. Final analyses (N=996 counties) were stratified by breast cancer subtype (HR+/HER2+, HR-/HER2+, HR+/HER2-, HR-/HER2-) and race (Black, White).

Results: We identified a five-factor model of social context: 1) racial and economic segregation, 2) population change, 3) generational dispossession, 4) economic environment, and 5) population and housing. Compared to counties in the first tertile, counties in the third (or highest) tertile of generational dispossession had significantly greater county-level Black breast cancer incidence rates across all subtypes; the strongest association was for HR+/HER2- breast cancer ($\hat{\beta}=56.7$, $P=0.02$). Better economic environment was associated with lower Black HR-/HER2- breast cancer incidence (third tertile: $\hat{\beta}=-26.8$, $P=0.02$). Similar associations of smaller magnitude were observed for county-level White incidence rates (generational dispossession third tertile: HR+/HER2- $\hat{\beta}=16.3$, $P<0.01$; economic environment third tertile: HR-/HER2- $\hat{\beta}=-5.2$, $P<0.001$). Additionally, counties in the third tertile of racial and economic segregation had lower White HR-/HER2- ($\hat{\beta}=-2.4$, $P=0.04$) and higher HR+/HER2- ($\hat{\beta}=11.9$, $P<0.001$) breast cancer incidence rates, whereas there was no significant association among Black women.

Conclusions: County-level social context was associated with county-level, subtype-specific breast cancer incidence, and associations differed by race. These preliminary findings may inform biosocial studies of breast cancer incidence among Black and White women.

38-T

Barriers and Facilitators to the Implementation of Adolescent Cancer Prevention Interventions in Rural Primary Care Settings: A Scoping Review

Ryan GW, Whitmire P, Batten A, Goulding M, Baltich-Nelson B, Lemon S, Pbert L

Purpose: We conducted a scoping review of studies to examine the implementation of interventions to promote adolescent cancer prevention in rural, primary care settings and identify barriers and facilitators.

Methods: We followed the JBI scoping review protocol and used a systematic extraction and coding process. Our search of MEDLINE, PsycInfo, Cochrane, CINAHL, and Scopus identified articles related to implementation of interventions in the following areas: obesity, human papillomavirus (HPV) vaccination, tobacco use, and sun exposure. We used the Consolidated Framework for Implementation Research (CFIR), an implementation framework consisting of 5 domains (outer setting, inner setting, intervention characteristics, individual characteristics, process), each with a sub-set of constructs, to classify barriers and facilitators reported.

Results: We identified 3046 references, excluded 2969 during initial screening, assessed 74 for full-text eligibility, and abstracted 24. Of these, 17 addressed obesity, 6 addressed HPV vaccination, 1 addressed skin cancer, and 1 addressed multiple behaviors. 10 studies were either non-randomized experimental designs (n=8) or randomized controlled trials (n=2). The remaining were observational or descriptive research. Barriers in the outer setting (e.g., lack of external funding sources, patients' beliefs) and inner setting (e.g., time available for implementation efforts and clinic infrastructure) were most common, compared to the other CFIR domains. Similarly, facilitators in the outer setting (e.g., partnerships with other organizations and parents' trust in health care providers) and inner setting (e.g., efficiency in practice protocols) were commonly reported.

Conclusions: Adolescence is a critical growth window to establish healthy behaviors to prevent future cancers. Rural areas have higher rates of cancer morbidity and mortality than urban ones, putting rural adolescents at heightened risk for cancers. Yet, we found a dearth of studies addressing the implementation of adolescent cancer prevention in rural primary care settings. Further research is needed to understand the implementation challenges and potential strategies to improve implementation efforts to promote cancer prevention among rural adolescents.

39-T

Cervical Cancer Screening with HPV Test Among U.S. Women: At the Intersection of Disability and High-Risk for HIV Infection

Orji AF, Williams MS

Purpose: In our previous analyses, we identified that women with disabilities were less likely to receive cervical cancer screening with HPV test. Previous studies have shown that women with disabilities are among key populations at a higher risk of HIV infection. The HPV test was recently recognized as the preferred method of cervical cancer screening by the American Cancer Society. The purpose of this study is to examine the prevalence of cervical cancer screening with HPV test among women at the intersection of disability and a high risk for HIV infection.

Methods: Our sample of 76,732 women with disabilities came from the 2018 and 2020 Behavioral Risk Factor Surveillance System. Modified Poisson regressions were conducted to estimate the crude, adjusted prevalence ratios and 95% confidence intervals of cervical cancer screening with HPV test to determine differences between women with and without a high risk for HIV infection. Multivariable analyses adjusted for covariates including age, race/ethnicity, and sexual orientation.

Results: The prevalence of cervical cancer screening with HPV test was 37.4% in the overall sample. Our adjusted regression analysis showed that women with a high risk of HIV infection had a higher prevalence of cervical cancer screening with HPV test than women without a high risk of HIV infection (aPR = 1.19; 95%CI 1.18, 1.20). Older age, non-heterosexual women, married and formerly married women had a lower prevalence of cervical cancer screening with HPV test.

Conclusions: Women with disabilities and a high risk for HIV infection reported higher prevalence of cervical cancer screening with HPV test. Further research is needed to understand why women with disabilities without a high risk for HIV infection have a significantly lower prevalence of cervical cancer screening.

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Characterizing the Cancer Burden in American Indian Populations in North Carolina

Spees LP, Jackson BE, Emerson MA, Baggett CD, Bell RA, Akinyemiju T, Salas A, Morris H, Wheeler SB

Purpose: North Carolina (NC) has the largest American Indian (AI) population in the eastern US. Despite cancer being the second leading cause of death among AI in NC, limited information is available on cancer incidence and mortality among this population. To fill this gap, we used a

population-based sample to: 1) describe the AI population diagnosed with cancer; and, 2) examine the differences in cancer incidence and mortality between AI and White populations.

Methods: We identified all cancer cases diagnosed among NC adult AI and White populations between 2003 and 2018 using the Cancer Information and Population Health Resource (CIPHR), which includes data from the NC Central Cancer Registry (NCCCR). We compared characteristic differences between the AI and White populations using ratios of relative frequency (RRF), and estimated incidence and mortality rates age-adjusted to the 2000 US standard population.

Results: Our population-based analytic sample included 5,405 AI and 565,170 White individuals. Compared to the White cancer population, AIs were more likely to live in rural areas (50% vs 26%; RRF=1.92), to receive Medicaid (19.4% vs 6.9%; RRF=2.78), and to be diagnosed at a younger age (median: 62 vs 66 years). In terms of stage at presentation, AI were less frequently diagnosed in situ (1.9% vs 3.4%; RRF=0.57) or localized (41.6% vs 44.9%; RRF=0.93) and more frequently diagnosed with regional (22.4% vs 20.6%; RRF=1.09) and distant stage (25.9% vs 23.5%; RRF=1.11). The most frequently diagnosed cancers among the AI population were lung and bronchus, prostate, female breast, colorectal, and kidney. Compared to the White population, there was a higher incidence rate (per 100,000 persons) among AI populations for stomach (5.8 vs 5.1) and liver (7.8 vs 6.5). In terms of mortality, AI populations had a higher mortality rate (per 100,000) for prostate (11.8 vs 8.3), stomach (3.0 vs 2.2), and liver cancer (4.0 vs 3.5).

Conclusion: This study identifies the most substantial AI disparities in cancer outcomes and provides guidance on where to target interventions to improve cancer outcomes among AI populations. Nevertheless, these estimates may underestimate the magnitudes of disparities given the known misclassification of AI in cancer registry data.

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HPV Vaccine Communication Styles and Challenges between Rural and Non-rural Primary Care Providers

Spees LP, Queen T, Biddell CB, Ozawa S, Yemeke T, Odebunmi OO, Higgins C, Wheeler SB

Purpose: Despite vaccine availability, HPV vaccine completion is 15 percentage points lower in rural areas compared to non-rural areas. Among a nationally representative sample of primary care providers, we identified differences in HPV vaccine communication challenges and strategies between rural and non-rural settings.

Methods: Our analytic sample included 2,527 primary care providers (57% response rate) who participated in a national survey between May 2022-June 2022. We assessed provider communication challenges by asking respondents to select from a non-mutually exclusive list of challenges identified in the literature and expert opinion (i.e., believing child does not need the vaccine; concerns about safety; concerns about promoting sex; mistrust of providers; mistrust of CDC vaccine recommendations). We also asked which HPV communication strategies they used with hesitant parents (i.e., option to receive vaccine another day, prepared talking points, providing educational materials, sharing patient stories, and motivational interviewing). Using log binomial regressions, we examined unadjusted and adjusted associations between provider rurality and our specified outcomes.

Results: Of the 2527 respondents, 232 (9.2%) practiced in rural areas. Providers in rural areas were more likely to be nurses (33% in rural areas vs 23% in non-rural areas), whereas pediatricians were more likely to practice in non-rural areas (13% in rural areas vs. 28% in non-rural areas). In unadjusted analyses examining communication challenges, rural providers reported that they faced concerns about vaccine safety from parents more than non-rural providers (77% vs 69%, $p < 0.008$) but were less likely to report having long discussions with parents (22% vs 28%, $p = .48$). In adjusted analyses, providers practicing in rural areas had significantly higher odds of reporting challenges related to parent concerns about vaccine safety compared to non-rural providers (RR: 1.13, 95%CI:1.04-1.22). In both unadjusted and adjusted analyses, there were no differences in the HPV communication strategies by rurality.

Conclusion: To increase HPV vaccination in rural areas, interventions may need to offer providers more information and strategies for how to address vaccine safety concerns of parents.

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Comparing an Intermittent Fasting Intervention with a Continuous Energy Restriction Intervention on Weight Loss in Community-Based Black Adults

Yeary KH, Yu H, Yao S, Johnson D, Harris N, Dauphin C, Saad-Harfouche F, DiCarlo E

Introduction: Compared to other racial/ethnic groups, Blacks have the highest rates of obesity, a well-established risk factor for some cancers. Continuous caloric energy restriction (CER) interventions consist of small reductions in daily caloric intake and are recommended by government agencies to treat obesity. However, these interventions are difficult to adhere to and cause less weight loss in Blacks compared to Whites. Intermittent fasting (IF), which can

consist of eating 25% of one's daily calorie intake per day on some days and ad libitum intake on other days, causes the same amount of weight loss as CER interventions. IF may be easier for participants to adhere to and may lower cancer risk and prognosis to a greater extent than can be attributed to weight loss alone. However, most IF studies have been conducted with White participants, and have provided participants with standardized meals and/or nutrition counseling not readily available in real-world situations. Thus, the purpose of our study is to test the effect of IF interventions in diverse groups outside of controlled settings.

Methods: We are comparing a 6-month CER intervention with a 6-month IF intervention on weight loss in Black adults using a blinded randomized controlled comparative effectiveness trial. Trained community health workers are delivering the interventions. Six churches (anticipated n=60) were randomized to either intervention. Staff blinded to treatment condition are collecting anthropometric, 3-day dietary food recall, and survey data at baseline and 6-month follow-up.

Results: To date, four churches (n=29) have completed baseline and follow-up assessments. Most participants were female (82.6%) with a mean age of 57.9 years. There were significant within group differences, with both IF and CER participants losing 3.2% (4.4) and 2.8% (4.5), respectively, of their body weight from baseline to 6-month follow-up.

Conclusion: This is the first study to test an IF intervention designed for community-based Black adults in a 'real-world' setting. If proven effective, this IF intervention has the potential to serve as an alternative to CER interventions for weight loss and cancer risk reduction in minority populations.

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Developing Strategies to Increase Implementation of Evidence-Based Interventions for Colorectal Cancer Screening in Federally Qualified Health Centers: an Implementation Mapping Approach

Valerio M, Savas LS, Costa C, Frachiseur G, Balasubramanian BA, Rogit D, Foxhall L, Fenton SH, Walker T, Allen C, McGaha P, Chenier RS, Hines D, Padilla J, Fernandez ME

Purpose: Low rates of colorectal cancer screening (CRCS) is a major contributing factor to the high incidence and mortality from colorectal cancer (CRC) in Texas and the US. Improved uptake and use of CRCS evidence-based interventions (EBIs) are needed to increase CRCS rates.

Methods: We partnered with Texas Federally Qualified Health Centers (FQHCs) to improve the adoption, implementation, and maintenance of four CRCS EBIs: provider assessment

and feedback, provider reminders, patient reminders, and reducing structural barriers. We used Implementation Mapping (IM), a systematic evidence-and theory-informed approach, to identify strategies to implement the EBIs.

Results: Following the five tasks of IM, at each clinic, we assessed organizational capacity and readiness to implement EBIs (Task 1). This process revealed individual, clinic, and system-level barriers and facilitators of EBI implementation, which then informed EBI selection (Task 2). Program champions, practice facilitation, telementoring, and EHR optimization (implementation strategies) were selected to address identified barriers. and planned evaluation of the implementation and CRCS outcomes in Task 3, including designing tailored implementation plans for selected EBIs using needs assessment results, theoretical frameworks, and stakeholder input. In Task 4, we focused on improving existing workflows, EHR data report templates, and other relevant protocols and materials. Finally, in Task 5, we evaluated program reach, effectiveness, adoption, implementation, and optimized maintenance.

Conclusion: Through the application of IM, we developed an implementation plan to facilitate the effective delivery of CRCS interventions within participating FQHCs. A systematic approach was essential for selecting and tailoring implementation strategies helpful to each FQHC to best promote the sustainability of implemented EBIs.

44-T

Did Exposure to Hurricane Andrew (1992) Influence Survival among People Diagnosed with Cancer? A 20-Year Retrospective Survival Study of People Diagnosed with Cancer in South Florida

Ashad-Bishop KC, Baeker-Bispo JA, Kobetz EK, Bailey ZD

Purpose: Limited research has examined the extent to which extreme weather events, which are expected to increase in frequency and severity due to climate change, disrupt cancer care. The purpose of this study was to examine whether exposure to Hurricane Andrew, a Category 5 storm, influenced survival among people diagnosed with breast, gynecological, and colorectal cancer in South Florida prior to the storm and whether the effect varied by race/ethnicity.

Methods: We used the Florida Cancer Data System registry to identify adults in Florida diagnosed with breast, gynecological, and colorectal cancer in the six months prior to when Hurricane Andrew made landfall in Miami-Dade County (MDC). Cases in MDC were coded as disaster-exposed and compared to matched cases selected from Florida counties that sustained hurricane-related winds and storm surge (disaster-proximal) and Florida counties that did not experience a hurricane during the study period

(unexposed). Kaplan-Meier curves were fit to estimate probability of survival and groups were compared using the log-rank test. Associations between hurricane exposure and survival were examined using crude and adjusted Cox proportional hazards models.

Results: We identified 1,199 cancer cases diagnosed among Non-Hispanic White, Non-Hispanic Black, and Hispanic/Latino people in MDC in the sixth months prior to when Hurricane Andrew made landfall. The disaster-exposed group had poorer median survival [97.1 months] than the disaster-proximal [102.4 months] and unexposed [116.2 months] groups ($P<.05$). Disaster-exposed people had worse overall survival than unexposed people in both crude (hazard ratio [HR], 1.16 [95% CI, 1.06-1.28]; $P<.01$) and adjusted (HR, 1.23 [95% CI, 1.10-1.37]; $P<.001$) analyses. These effects varied significantly when analyzed by race/ethnicity and cancer type.

Conclusions: These data suggest that hurricane exposure decreases probability of survival among people diagnosed with cancer and that the effect varies by race/ethnicity. Future studies investigating the role of exposure to natural disasters in patterning disparities in cancer outcomes, stratified by social and neighborhood context, may advance our understanding of who is most affected by these phenomena for different cancers.

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Disparities in Cancer Clinical Trial Information-Seeking: Findings from the National Cancer Institute's Cancer Information Service

Huang GC, Wilson A, Schrader S, Kueppers G, Pearson, D, Vanderpool RC

Purpose: Although cancer clinical trials (CCT) are important for advancing science, clinical care and treatment, and patients' quality of life along the cancer continuum, they are not always equitably accessed by disadvantaged populations, nor do we fully understand individuals' information-seeking patterns around CCT. This descriptive study aims to identify CCT information-seeking behaviors and sociodemographic characteristics of individuals contacting a national cancer information service.

Methods: Using data from the National Cancer Institute's Cancer Information Service (CIS) – a longstanding, multichannel resource for cancer information in English and Spanish, we examined CCT inquiries from caregivers, survivors, health professionals, and the general public over a 4-year period. We conducted descriptive and logistic regression analyses to examine the characteristics of these inquiries and their odds of involving a discussion about CCT.

Results: Between September 2018 – September 2022, 101,722 CIS inquiries originated from survivors, caregivers, health professionals, and the general public. Of these, over one-quarter included a CCT discussion ($n=27,587$). Of the CCT inquiries, 53.6% originated from caregivers, 35.3% from survivors, 6.0% from the public, and 5.1% from health professionals. Logistic regression results indicated that inquiries in Spanish had lower odds of a CCT discussion ($OR=.26$, [.24-.28]). Inquiries emanating from the cancer.gov instant chat service and email had higher odds of discussing CCT ($OR=2.25$, [2.17-2.33]; $OR=1.24$, [1.17-1.30], respectively) compared to inquiries made by telephone. Logistic regression findings for inquires with available user sociodemographic information revealed that users who were older, had lower income and education, no insurance coverage, and resided in rural locales had lower odds of a CCT discussion (all statistically significant).

Conclusions: Findings suggest there are potential disparities in CCT information-seeking among vulnerable populations. These results affirm the continuing need for multiple, language concordant cancer information platforms to promote and disseminate quality CCT information, thereby enabling equitable awareness of – and ultimately participation in – CCT among all populations.

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Disparities in Lung Cancer Clinical Trial Discussion and Enrollment at a Safety Net Hospital

Dudipala HR, Jani C, Radwan A, Al Omari O, Patel M, and Tapan U

Purpose: To investigate disparities in lung cancer clinical trial discussion and enrollment at Boston Medical Center (BMC), the largest safety net hospital in New England.

Methods: We included 1,121 patients with a diagnosis of lung cancer between January 2015 to December 2020 at BMC. To determine clinic trial status, we queried electronic medical records on EPIC by either entering “clinical trial”_ or “enroll”_ into the search feature, or by navigating through oncology notes and filtering for “research encounter.”_ Each chart was reviewed for one of three categories: 1) clinical trial discussed and patient enrolled, 2) clinical trial discussed but patient not enrolled, 3) clinical trial not discussed. Sociodemographic variables such as age, gender, race, ethnicity, city, primary language, median household income, medical insurance, and education level were collected. SPSS version 26.0 was used for statistical analysis. Chi-square analysis was used for qualitative variables, while t-test analysis was used for quantitative variables. A p-value <0.05 was determined statistically significant.

Results: Of 1,121 patients, 34.3% were black, 47.1% were white, 16.9% did not speak English, 8% were Hispanic, 70.6% had an education of high school or below, and 70.6% had a lower median household income (<\$84,000). Clinical trials were discussed in 141 patients (12.6%), of which 22 (15.6%) were enrolled. Of patients who had clinical trial discussions, 38.3% were black and 44% were white, and of those who were enrolled, 50% were black and 25% were white. When looking at age, clinical trial discussions were conducted more with younger patients (68.19 vs 71.37, $p=0.001$). There was no significant difference in clinical trial discussion or enrollment between gender, race, ethnicity, primary language, education level, insurance type, or median household income.

Conclusions: Despite BMC's low income, low education, and racially diverse population, clinical trial discussion and enrollment rates were similar across various sociodemographic factors. The only difference was that clinical trials were discussed more with younger populations. In the future, it is important to continue investigating and maintaining health equity in safety net hospitals that serve such diverse populations.

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Disparities in Lung Cancer Mortality by Sex, Race, Ethnicity, and Rural-Urban Status

Kava CM, Siegel DA, Sabatino SA, Henley SJ

Purpose: Our objectives were to describe recent age-adjusted death rates for lung cancer and examine trends and disparities over time in death rates for all cancer sites combined, lung cancer, and all cancer sites excluding lung by sex, race, ethnicity, and rural-urban status. This study contributes new information on deaths from lung cancer relative to deaths from other cancers.

Methods: We used 1999-2020 data from the National Vital Statistics System, which captures information on all US deaths. We examined age-adjusted lung cancer death rates in 2020 per 100,000 persons by cancer type, sex, race, ethnicity, and rural-urban status. We calculated the proportion of the difference in 2020 death rates due to lung cancer. We calculated average annual percent change (AAPC) in age-adjusted cancer death rates between 1999-2020 by cancer type, sex, and rural-urban status using Joinpoint regression.

Results: In 2020, lung cancer accounted for 23% of all cancer deaths. The age-adjusted death rate for lung cancer was higher for males (38.05) compared to females (26.93). For females, lung cancer death rates by race and ethnicity were highest among White, non-Hispanic females (30.34), and for males, among Black, non-Hispanic males (45.57). Lung cancer death rates were higher in rural vs. urban settings for females (33.55 vs. 25.74) and males (49.04 vs. 35.89). In 2020, 46% and 49% of the rural-urban difference

in death rates for all cancers combined among females and males, respectively, was due to lung cancer. During 1999-2020, there were significant declines in death rates for all cancer sites combined, all cancer sites excluding lung, and lung cancer. Larger declines in cancer deaths, including lung cancer, were observed in urban (AAPC range: -1.4 to -3.5) vs. rural (AAPC range: -0.7 to -2.6) settings, leading to increased disparities over time.

Conclusion: In 2020, lung cancer death rates were highest among males and in rural settings. Disparities in cancer deaths by rural-urban status have widened over time; half of the difference in disparities for 2020 was due to lung cancer. Partnering with rural communities to identify and address opportunities to improve lung cancer prevention, screening, and treatment may reduce inequities in cancer mortality.

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Recent Patterns and Disparities in Lung Cancer Treatment: National Program of Cancer Registries

Kava CM, Siegel DA, Qin J, Sabatino SA, Wilson R, Wu M

Purpose: Treatment for lung cancer can improve prognosis, but five-year survival remains <25%. We describe recent patterns in first-course treatment for lung cancer and examine disparities in treatment by sociodemographic characteristics. This study contributes new information on lung cancer treatment among cases reported to registries that cover 96% of the US population.

Methods: We used 2015-2019 data from the National Program of Cancer Registries, covering 45 US states and District of Columbia. We restricted our analysis to adults aged >20 years at diagnosis with lung and bronchus cancer. We produced descriptive statistics to examine patterns in surgery, chemotherapy, radiation, and immunology. We ran five multivariable logistic regressions to model odds of receiving each treatment, and at least one treatment, by sociodemographic characteristics including census tract poverty level, sex, race, and ethnicity. We adjusted all models for histology and stage.

Results: Among 892,615 cases, the percent receiving surgery, chemotherapy, radiation, and immunotherapy was 23%, 42%, 42%, and 12%, respectively. Residents of high- vs. low-poverty neighborhoods were less likely to receive surgery (OR=0.77; 95% CI: 0.76, 0.78), chemotherapy (OR=0.83; 95% CI: 0.82, 0.84), and immunotherapy (OR=0.84; 95% CI: 0.82, 0.85). Disparities varied according to treatment type; for example, females were less likely to receive chemotherapy (OR=0.95; 95% CI: 0.94, 0.96), radiation (OR=0.94; 95% CI: 0.94, 0.95), and immunotherapy (OR=0.97; 95% CI: 0.95, 0.98), but more likely to receive surgery (OR=1.16; 95% CI: 1.15, 1.17). When adjusted for histology and stage, those aged >45 years (vs.

20-44); female; Asian or Pacific Islander, Black, or Hispanic (vs. White); and living in high-poverty areas had significantly lower odds of receiving at least one treatment.

Conclusion: Chemotherapy and radiation were the most common first-course treatments for lung cancer. Receipt of at least one treatment was lower among those living in high-poverty areas and among racial and ethnic minorities. Future investigations accounting for factors such as systemic racism and healthcare coverage could identify reasons for disparities to inform potential interventions.

49-T

Disparities in Radon Testing among Vulnerable Populations in North Carolina

Meernik C, Yang Z, Gibson P, Raveendran Y, Hammond E, Koch A, Clarke J, Zhang J, Akinyemiju T

Purpose: Radon exposure is the leading cause of lung cancer among non-smokers and contributes to 21,000 lung cancer deaths annually in the U.S. Home radon testing and mitigation can decrease radon levels by 50-90% and effectively reduce the risk of lung cancer. However, awareness of radon is lower among vulnerable populations defined by social determinants of health (SDOH), including race/ethnicity and education, which may contribute to disparities in radon testing. Using statewide data, we characterized the likelihood of radon testing among vulnerable populations in North Carolina (NC).

Methods: We conducted a novel data linkage between the largest radon testing company in NC (~60% of all radon tests in the state) and the National Neighborhood Data Archive to obtain SDOH characteristics for 26,020 unique NC homes that tested for radon between 2010-2022. We analyzed the proportion of radon tests conducted by zip code-level quartiles of proportion Black, proportion with less than a high school education, and proportion with socioeconomic (SES) disadvantage (defined by four SES indicators) among all NC counties (n=100) and among NC counties in the highest quartile of lung cancer incidence rates.

Results: A lower proportion of radon testing occurred in areas with a higher proportion of residents who were Black (highest quartile Black: 14% of all radon tests vs. lowest quartile Black: 26%); <high school education (highest quartile low education: 9% vs. lowest quartile low education: 38%); and SES disadvantage (highest quartile disadvantage: 14% vs. lowest quartile disadvantage: 32%). When analysis was limited to counties with the highest lung cancer rates, no clear trends were observed by education or SES disadvantage. However, the testing disparity by Black race persisted (highest quartile Black: 15% of all radon tests vs. lowest quartile Black: 31%).

Conclusions: The EPA recommends universal home radon testing, regardless of geographic region, because of the influence of housing characteristics on individual-level radon exposure. These data reveal striking disparities by SDOH in the likelihood of radon testing in NC and highlight the need to promote more widespread radon awareness and testing, particularly among vulnerable populations.

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Does Having Type 2 Diabetes Increase the Odds of Cervical Cancer Diagnosis? A Nested Case-Control Study of a Florida Statewide Multisite EHR Database

Mkuu RS, Hall J., Galochkina Z, Cho H, Chakrabarti C, Avery D, Higginbotham J, Lockhart J, Guo Y, Staras S, Shenkman E, Ji-Hyun L

Purpose: Our aim was to elucidate the relationship between Type 2 Diabetes (T2D) and cervical cancer diagnosis and to examine whether the intersectionality of race/ethnicity and T2D plays a role in cervical cancer diagnosis.

Methods: We analyzed statewide electronic health records (EHR) data from the OneFlorida+ Data Trust. We used an optimal matching algorithm to create 1:4 nested case-control dataset. Cases were defined as the patients with cervical cancer in the period 01/01/2012 to 12/31/2019. Controls were patients without a diagnosis of cervical cancer. We used statistics such as mean and standard deviation for continuous variables and frequency and proportion for discrete variables to describe the sample. We used conditional logistic regression to estimate the unadjusted and then the adjusted odds ratios (ORs) and associated 95% confidence intervals (CIs) to examine the association between cervical cancer and T2D.

Results: The proportion of T2D among the sample without a cervical cancer diagnosis (n= 402,956) was 2.3%. The proportion of T2D among the sample with a cervical cancer diagnosis (n= 100,739) was 2.8%. A multivariable model examining the intersection of race/ethnicity and T2D status showed that after adjusting for sociodemographic characteristics, Non-Hispanic Black women with T2D had 58% higher odds of cervical cancer compared to non-Hispanic White women with T2D (OR: 1.58, 95% CI (1.41-1.77)). In the same multivariable model, factors associated with higher odds of cervical cancer included living in a rural area (OR: 1.39, 95% CI (1.34-1.44)), having Medicaid (OR: 2.16, 95% CI (2.12-2.21)) or Medicare (OR: 2.15, 95% CI (2.07-2.24)), or living in an area with high social vulnerability (OR: 1.25, 95% CI (1.22-1.29)).

Conclusions: Intersected with race, T2D is a significant predictor of getting a cervical cancer diagnosis. Non-Hispanic Black women who have T2D had a significantly higher odds of cervical cancer diagnosis compared to non-Hispanic White

women with T2D. Black women with T2D may be especially vulnerable to cervical cancer. Our findings also add to the vast literature highlighting the need to address the higher burden of cervical cancer diagnosis among women living in poverty.

51-T

Effects of a Circuit, Interval-Based Exercise Program on Metabolic Syndrome and Sarcopenic Obesity Among Black and Hispanic Cancer Survivors

Christopher CN, Kang DW, Wilson RL, Gonzalo-Encabo P, Normann A, Norris M, Dieli-Conwright CM

Background: Cancer survivors are at a higher risk of metabolic syndrome (MetS) and sarcopenic obesity, both of which exacerbate risk of poor survivorship outcomes. Further, Hispanic and Black adults are more likely to be sedentary and obese compared to non-Hispanic white adults, increasing the risk of cardiometabolic comorbidities. While exercise can improve cardiometabolic health, few studies focus on the effects among minority cancer survivors. The purpose of this secondary analysis was to examine the impact of a 4-month exercise intervention on MetS and sarcopenic obesity in Black and Hispanic cancer survivors.

Methods: Sedentary, breast, prostate, or colorectal cancer survivors who were overweight or obese, and self-identified as Black or Hispanic were randomized to exercise (n=30) or usual care (n=10). The exercise intervention included a supervised, circuit, interval-based aerobic and resistance training program, training 3 days/week for 4-months. Outcomes including MetS z-score and sarcopenic obesity (measured through appendicular skeletal mass index and BMI) were recorded at baseline and post-intervention.

Results: Participants were 66 ffl 10.4 years old, 78% overweight, 55% Hispanic, and 45% Black. Intervention adherence was 90% and post-intervention measures were available on all participants. Compared to usual care, MetS z-score (between group mean difference: -5.1, 95% CI, -7.1 to -2.5, $p<0.001$) and sarcopenic obesity (appendicular skeletal mass index: 2.6, 95% CI, 1.0 to 4.3, $p<0.001$; BMI: -1.5, 95% CI, -3.9 to -0.9, $p=0.002$) significantly improved post-intervention.

Conclusions: A 4-month circuit, interval-based exercise intervention significantly improved MetS and sarcopenic obesity in Black and Hispanic cancer survivors. Our findings support that supervised exercise interventions may be effective to improve cardiometabolic health among Black and Hispanic cancer survivors and target existing cancer survivorship health disparities. Future research should continue to explore culturally tailored exercise programs and various exercise modalities in minority cancer survivor populations.

52-T

Engaging Patient Advocates in Breast Cancer Research: Opportunities to Reduce Breast Cancer Disparities

Edmonds MC, McIntyre C, Wittig L, Epenschied-Reilly A, Fowles McNair M

Purpose: Inclusion of patient advocates in breast cancer research have the potential to reduce breast cancer health disparities and enhance implementation of research; yet patient-advocates are often not included in clinical research. We developed a patient advocate training program to increase biomedical knowledge, address patient access barriers and to increase participation in genomic research among Black women in 5 geographical cities with the highest breast cancer disparities.

Methods: 136 women were recruited to become a breast cancer patient advocate. Training materials on self-advocacy, diagnostic screening, clinical trials and healthcare discrimination topics were developed and evaluated by field experts and content designers. Women received the final training materials which included, (videos and modules). We surveyed patient advocates on their knowledge of biomedical information, their attitudes, and beliefs toward being a patient advocate, healthcare access barriers and their participation in breast cancer research. We conducted bivariate statistics to describe the sample and factors associated with completing the patient advocate training.

Results: 82% of the sample were Black, 18% were non-Black. 31% of women were between the ages 31 and 50. Overall, 82% of women completed the patient advocate training program and 63% completed the pre-post survey assessments. Navigating the health system (50%) and communicating with clinical providers (48%) were the top reported health care barriers at baseline. Following the patient advocate training women knowledge around genetic testing and clinical trials increased. Women also found the training helpful in preparing their readiness to communicate genetic risk information to their patient network.

Conclusion: This article provides an overview of training strategies to promote patient-advocates within biomedical research. Our training materials for patient advocates enhanced their biomedical knowledge and willingness to advocate for patients by 22%. Findings from this work highlight our strategies to optimize patient- advocates involvement with patients to ultimately improve uptake of mammography screening, genetic testing, and participation in clinical trials.

53-T

Epigenetic Aging Differs by Race, Subtype and Social Vulnerability Index in Breast Cancer Patients

Wu YN, Thompson CL, Schumacher FR

Purpose: Although breast cancer (BrCa) disparities by age of onset, subtype and mortality are well recognized between Black and White women, the underlying causes remain unknown. We were interested in the impact of methylation on racial disparities, BrCa subtypes and social vulnerability index (SVI).

Methods: A whole-genome methylation array was used with DNA extracted from blood samples from women diagnosed with BrCa. After quality control, 158 BrCa patients were included. The biological age and epigenetic age acceleration, defined as the residual from regressing chronological and biological age, were computed using Horvath and GrimAge clocks. The association with aging for the independent factors of self-reported race, BrCa molecular subtypes (ER and HER2), and SVI were evaluated with Mann-Whitney tests and linear regression models. Statistical significance was defined as a p-value <0.05.

Results: Nearly one-third of our sample were self-reported Black women (28.8%) and the overall mean age at diagnosis was 57.8 years ffl11.6. The proportion of women diagnosed with ER- and HER2+ BrCa was 43.6% (N=68) and 14.7% (N=23), respectively. Overall, the mean age acceleration is estimated as 2.41 years greater for Black women compared to White women by the GrimAge clock (p=0.005), and 0.87 years for the Horvath clock (p=0.52). Among ER- BrCa subtypes, Black women had an average biological age of 1.68 years greater than White women (p=0.24). Similarly, among HER2+ BrCa, the biological age for Black women was 2.62 years older than White women (p=0.14). In addition, the SVI median stratified analysis identified a 1.24-year increased age difference for Black women compared to White women in the upper SVI. In the lower SVI stratified analysis, the biological age for Black women was 0.67 years younger than White women.

Conclusions: Our analysis identified statistically significant epigenetic age acceleration differences between self-reported Black and White BrCa patients. Both stratified analyses by BrCa subtype and SVI yielded biological age differences by self-reported race, however, directional effects differed based on strata. Although our sample size is limited, our stratified analysis revealed novel research directions to better understand racial disparities in BrCa.

54

Examining Racial Disparities in the Association between Food Deserts, Food Swamps, and Early-Onset Colorectal Cancer Mortality

Bevel MS, Sheth A, Tsai MH, Parham A, Andrzejak SE, Jones SR, Moore JX

Purpose: Healthy food consumption is a modifiable factor shown to reduce colorectal cancer (CRC) death, but residing in geographical areas with no access to healthy food options (food deserts) or unhealthy food options (food swamps) reduces healthy food accessibility and has been severely understudied especially among underserved Black-Indigenous Persons of Color (BIPOC). We explored the relationship between residing in food swamps and deserts with risk of early-onset CRC death.

Methods: We conducted a retrospective analysis utilizing 2010 – 2020 data from the U.S. Department of Agriculture Food Environment Atlas linked by county codes with patient data years 2010 – 2020 from the Surveillance, Epidemiology, and End Results (SEER) Program. Food swamp score (FS) was calculated as the ratio of fast-food and convenience stores to grocery stores and farmer's markets. Food desert score (FD) was calculated as the proportion of SEER patients living more than one mile (urban) or 10 miles (rural) from a grocery store and household income \leq 200% of the federal poverty threshold. We categorized FD and FS to low, moderate, or high; higher scores indicated patients living in counties with poorer healthy food resources. Multilevel Cox proportional hazard models were used to estimate the association between FD, FS, and early-onset CRC death.

Results: Among 750,498 SEER patients, majority of CRC death was in high FS counties. NH-black patients-high-FS counties had an increased risk of early-onset CRC death (adjusted hazard ratio (aHR) = 1.27, 95% CI = 1.20 – 1.35), while American Indian/Alaskan Natives/Other (AI/AN/Other) patients-moderate-FS counties had reduced risk of early-onset CRC death (aHR = 0.71, 95% CI = 0.53 – 0.96), when compared to NH-white patients-low-FS counties. Similarly, NH-black and Hispanic patients-high FD counties had significantly increased risk of early-onset CRC death.

Conclusions: NH-black patients living in the worst food environments had increased risk of early-onset CRC death. We suggest that policymakers and community stakeholders should employ sustainable approaches at combating early-onset CRC in underserved racial communities by increasing healthier accessible food sources (e.g. creating more walkable neighborhoods and community gardens).

55

Financial Constraints on the Use of Breast Cancer Risk-Management Care Among a Community-Based Sample of High-Risk Women

Muraveva A, Meadows RJ, Jones SM, Padamsee TJ

Background: Clinical guidelines recommend risk-management care for women with an estimated $\geq 20\%$ lifetime risk of breast cancer (BC). Yet, use of guideline-concordant care is low and reasons for the low use are not well understood. The study aimed to examine the associations between financial constraints (health insurance continuity, feelings about present income, and competing financial demands) and use of risk-management care (genetic testing, genetic counseling, and breast or cancer specialist visits).

Methods: Non-Hispanic Black or white women aged 18-74 years, with no prior history of cancer, and $\geq 20\%$ lifetime BC risk were recruited from online research volunteer databases, social media, and clinics. Participants completed an online survey about family history, decision-making factors, and risk-management behavior. We used descriptive statistics to calculate proportions and logistic regression to estimate odds ratios and 95% confidence intervals.

Results: A total of 717 Black (35%) and white women (65%) completed the survey. Most (92%) were currently insured, but 54% reported previous insurance disruptions and only 40% reported 'living comfortably' on present income. We observed low use of genetic counseling (31%), genetic testing (36%), and discussions of BC risk with specialists (43%). Disrupted insurance was associated with lower odds of genetic counseling (OR=0.55 [95% CI: 0.38, 0.80]), genetic testing (OR=0.70 [95% CI: 0.48, 1.03]), and specialist care (OR=0.59 [95% CI: 0.41, 0.85]). Similar associations were observed for perceived financial hardship and use of risk-management care. Compared to partnered-with-children households, all other family structure types had lower odds of use for all three risk-management services. Single mother households had the lowest odds of use of all three risk-management services (ORs: 0.17–0.33 [95% CIs: 0.21–0.57]). Neither being a caretaker to an adult nor managing chronic health condition(s) were significantly associated with the use of risk-management care.

Conclusions: Financial constraints are associated with lower use of risk-management care. Future work should continue to investigate how the complexities of financial factors constrain BC risk management and develop strategies to help mitigate their impact.

56-T

Patient Awareness of Elevated Breast Cancer Risk after Routine Screening Mammogram and Risk Notification

Padamsee T, Mason R, Muraveva A, Figueroa W, Swinehart-Hord P, Kalister S, Sardesai S, Siddiqi B, Hawley J, Taylor C, Agnese D, Cassingham H, Sweet K, Huber N, Basinger H*

Background: Population-based screening for breast cancer (BC) risk, which pairs regular mammograms with risk prediction modeling, can identify women with $\geq 20\%$ lifetime risk to facilitate risk-management counseling. In 2019, the Ohio State University Wexner Medical Center (OSUWMC) started assessing lifetime BC risk for all women undergoing routine screening mammography. Those found to have $\geq 20\%$ lifetime risk are notified and advised to consult a healthcare provider.

Purpose: To assess the degree to which women remembered receiving the notification letter and recalled its content, at points up to 1 year after receiving the notification.

Methods: Eligible individuals were all those aged ≥ 18 years who received a routine screening mammogram at one of OSUWMC's 14 mammography sites between April 2019 and October 2020, and whose risk prediction modeling indicated that they may be at $\geq 20\%$ lifetime BC risk. Participants completed an online survey approximately 2 weeks (n=152), 3 months (158), or 1 year (149) after receiving the risk notification. Descriptive analyses were used to assess recall of the notification and its content.

Results: A total of 459 participants, aged 39-69 years [mean=50.5 years (SD=7.3)] were mostly white (90%) with a bachelor's degree or higher (78.4%) and above-median income (52.1%). Most recalled receiving the notification (66.9%), perceived the information not to be complex (47.1%), and were confident they understood the notification (61.0%). Among those who remembered the notification, about half recalled one of its two messages: that they may be at elevated risk (52.1%) or the suggestion to discuss their risk with a provider (50.1%). Only 31.6% of participants recalled both messages. A statistically significant higher proportion of participants remembered receiving the notification after only 2 weeks (71.5%) compared to 3 months (59.5%) or 1 year (59.7 %) ($p < 0.05$). Recall of the elevated risk message followed the same pattern (63.6% 2 weeks, 47.0% 3 months, 44.3% 1 year) ($p < 0.05$).

Conclusions: These findings indicate that population-based screening has potential to provide patients with valuable information, but that communicating elevated risk status and the need to talk to a provider may require more than a notification letter.

57-T

Financial Hardship Screening among Native American Patients with Cancer: A Qualitative Analysis

Anderson-Buettner AS, Janitz AE, Madison SD, Doescher MP, Harjo KL, Darte SL, Bear MB, Khoussine MA, Rhoades DA

Purpose: We sought to characterize cancer-related financial hardship faced by Native American patients and identify facilitators and barriers at both patient and clinician levels to inform implementation of financial hardship screening.

Methods: In 2022 we conducted key informant interviews with eleven Native American patients with cancer and clinical staff at a single cancer center in Oklahoma. Patient interviews included questions about current financial hardship, experiences in discussing financial hardship with the cancer care and primary care team, and acceptability of completing a financial hardship screening tool at the cancer center. Clinician interviews focused on confidence, comfort, and experience in discussing financial hardship with patients. Recorded interviews were transcribed and thematically analyzed using MAXQDA® software.

Results: Patients expressed many financial challenges to receiving cancer care. The most frequently stated challenges included transportation, lodging during treatment, food insecurity, and utility expenses. Patients were willing to complete a financial hardship screening tool, but indicated this tool should be short and not overly intrusive of the patient's finances. Clinical staff described discomfort in discussing financial hardship with patients, primarily due to a lack of training and knowledge about resources to support patients. There were also differing perspectives on who should be responsible for addressing financial hardship and timing of such screening.

Conclusions: We identified facilitators and barriers at both the patient and clinician levels to complete a financial hardship screening tool. These preliminary findings suggest that cancer centers need to develop clear organizational structures and processes for financial hardship to be addressed effectively. We are currently implementing a screening tool in a pilot study and conducting additional interviews among patients and clinical staff to identify methods to address financial hardship among Native American cancer patients. Findings from the pilot intervention will also be presented.

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Higher Levels of HPV Vaccine Hesitancy among Hispanic, Male, and Non-Binary Rural Young Adults in the Western U.S., 2020-2021

Christini K, Richardson R, Aanderud Tanner H, Petrik A, Coronado G, Kepka D

Purpose: Assess differences in HPV vaccine hesitancy by rurality, gender, and ethnicity among young adults in the western United States.

Methods: A cross-sectional survey was conducted among young adults (YAs) ages 18-26 years living in rural and urban areas in 12 western U.S. states (Oct. 2020 – Apr. 2021). Participants (N=2937) answered HPV vaccine hesitancy and healthcare questions. Factor analysis evaluated n=27 items to create individual coarse scores for three scales of vaccine hesitancy (n, Cronbach's alpha): HPV vaccine confidence (n=6, $\hat{\text{ffl}}=0.71[95\%CI: 0.69-0.73]$), HPV complacency (n=11, $\hat{\text{ffl}}=0.73[95\%CI: 0.71-0.75]$), and HPV vaccine complacency (n=3, $\hat{\text{ffl}}=0.81[95\%CI: 0.78-0.82]$). Differences were examined by rurality, gender, and ethnicity, as well as rurality among Hispanic YAs and rurality among gender groups (female, male, and other). Logistic regression estimated odds (ORs). Directed acyclic graphs (DAGs) identified scientifically meaningful and minimally sufficient covariates.

Results: Hispanic YAs had significantly higher odds of HPV vaccine hesitancy across all HPV scales: confidence (1.55 [95%CI:1.23-1.96]), complacency (1.53 [95%CI:1.22-1.93]), and HPV vaccine complacency (1.28 [95%CI:1.01-1.61]). Similarly, male YAs had significantly greater odds of high vaccine hesitancy compared to female YAs: confidence (2.01 [95%CI:1.66-2.44]), complacency (2.14 [95%CI:1.77-2.60]), and HPV vaccine complacency (1.30 [95%CI:1.07-1.57]). We observed significantly higher HPV vaccine complacency among non-Binary YAs (2.24 [1.06-5.17]). Significantly higher HPV vaccine hesitancy among rural YAs was observed in the dimensions of vaccine confidence (1.66 [95%CI: 1.37, 2.01]) and HPV vaccine complacency (1.79 [95%CI:1.48-2.17]) scales, compared to urban YAs. We observed similar differences by rurality among gender and ethnic groups, which was most pronounced among Hispanic YAs; strong and significantly higher odds of hesitancy among rural Hispanic YAs for HPV vaccine confidence (OR=2.13 [95%CI:1.33-3.49]) and HPV vaccine complacency (OR=2.11 [95%CI:1.33-3.40]) compared to urban Hispanic YAs.

Conclusions: Rural interventions, tailored for gender and ethnicity, are needed to decrease HPV vaccine hesitancy among rural YAs to decrease risk for HPV-related cancers.

59

Hypertension: Incidence and Associated Risk Factors Among Black and White Breast Cancer Survivors Treated with Anthracycline Chemotherapy or Trastuzumab

Sutton AL, He J, Hines AL

Purpose: Studies indicate racial differences in the presence of hypertension upon a breast cancer diagnosis; however, the rates and risk factors associated with hypertension following breast cancer diagnosis and treatment are lacking.

Methods: This retrospective cohort analysis studied Black and white women diagnosed with stages I-III breast cancer and treated with anthracycline chemotherapies or trastuzumab from 2009-2019 at Virginia Commonwealth University Massey Cancer Center. Women had no prior indication of a hypertension diagnosis or receipt of antihypertensive medications at the time of their breast cancer diagnosis. All data (e.g., race, treatments) were abstracted from the electronic health record. A hypertension diagnosis was identified using International Classification of Diseases, versions nine and 10 codes. Analyses included descriptive statistics and Cox proportional hazard models.

Results: Of 627 women, 66.2% were white, 33.8% were Black, and 45.0% developed hypertension before censoring. In bivariate analysis, baseline characteristics associated with hypertension were age at breast cancer diagnosis, race, insurance status, geographic location, and body mass index. Among Black women, the rate of hypertension was 65.1% compared with 34.7% for white women ($p < 0.001$). After adjusting for other risk factors, Cox regression analysis indicated that white women were less likely to develop hypertension than Black women (hazard ratio [HR], 0.46; 95% confidence interval [CI], 0.35-0.61). Additional baseline characteristics significantly associated with hypertension included: > 50 years of age (HR, 1.35; 95% CI, 1.04-1.74); residing in non-metropolitan areas (HR, 0.55; 95% CI, 0.41-0.76); public insurance (HR, 1.61; 95% CI, 1.19-2.18), obesity (HR, 1.65; 95% CI, 1.17-2.34); and diabetes (HR, 2.29; 95% CI, 1.45-3.61). Trastuzumab or anthracycline use did not confer an elevated risk of hypertension in this sample.

Conclusions: Among women who receive cardiotoxic treatment, sociodemographic characteristics and comorbid conditions were the most salient predictors of hypertension risk. These findings warrant further investigation of the roles of social determinants of health and cancer care delivery factors on hypertension risk.

60-T

Identifying Risk for Household Material Hardship and Food Insecurity among Children with Cancer

Ortiz MJ, Hong S, Chou M, Perdomo BP, McDaniels-Davison C, Banegas MP, Aristizabal P

Purpose: Cancer is a leading cause of death among US children. Among Latinx children with cancer, familial cultural and socioeconomic barriers, such as household material hardship (HMH) and food insecurity (FI), increase risk for limited access to care and poor health outcomes. In this prospective observational study, we aimed to compare the prevalence of HMH and FI over time between Latinx and non-Hispanic White (NHW) families of children with cancer.

Methods: Parents/guardians of a child aged 0-17 years with newly diagnosed cancer (≤ 6 mo at time of enrollment) and receiving treatment at Rady Children's Hospital-San Diego were enrolled from July 2019 to November 2021. Eligibility also included ability to write and speak English or Spanish. HMH and FI were assessed via surveys at baseline and at 3-, 6-, 12- and 24-months following enrollment. Generalized estimating equation (GEE) models with binomial distribution and exchangeable correlation were used to assess the longitudinal associations between Latinx ethnicity with HMH and FI, adjusting for sociodemographic covariates.

Results: Participants ($n=107$) included 61 Latinx (57%) and 46 NHW (43%) parents/guardians. The majority were married (74%), <45 years old (80%), primarily spoke English at home (74%) and had public insurance (55%). At baseline, HMH was reported by 63% Latinx participants vs. 38% NHW ($p=0.25$), and FI was reported by 56% Latinx participants vs. 44% NHW ($p=0.65$). In adjusted GEE models, Latinx participants experienced lower risk of HMH (OR_{adj}=0.85, 95% CI:0.39-1.87) and FI (OR_{adj}=0.58, 95% CI:0.22-1.55) over time, compared to NHW. Public insurance was associated with increased risk of HMH (OR_{adj}=2.71, 95% CI:1.23-5.96) and FI (OR_{adj}=4.09, 95% CI:1.39, 12.05) over time, compared to private insurance.

Conclusions: Self-reported HMH and FI were highly prevalent at the 24-month follow-up, though they did not significantly differ between Latinx and NHW families. Public insurance was associated with excess risk of both HMH and FI over time. Despite no observed differences between Latinx and NHW families, it is imperative that larger studies investigate the long-term patterns of socioeconomic barriers to health and their association to cancer outcomes among underserved childhood cancer patients.

61-T

Impact of Insurance Status on Survival and Late-stage Disease Presentation among US Gastric Cancer Patients: A SEER Population Analysis

Akhiwu TO, Freeman JQ

Purpose: The impact of insurance status on cause-specific survival and risk of late-stage disease among gastric cancer (GC) patients in the US have been less well defined.

Methods: A retrospective study was performed using population-based data of GC patients aged 18-64 years in Surveillance Epidemiology and End Results (SEER), 2007-2016. GC was pathologically confirmed. Events were defined as GC-specific deaths; patients without the event were censored at the time of death from other causes or at the last known follow-up. Late-stage disease was stage III or IV. Insurance status was categorized as uninsured, Medicaid, and private insurance. Median survival time (in months) by insurance group was compared using Kaplan-Meier statistics with log-rank tests. Cox proportional hazards regression was used to assess the association between insurance status and GC-specific survival. Logistic regression was used to examine the relationship of insurance status and late-stage disease presentation.

Results: Of 5,529 patients, 78.1% were aged ≥ 50 years, 54.2% were White, 19.4% were Hispanic, and 14.0% were Black. 73.4% had private insurance, followed by 19.5% Medicaid and 7.1% uninsured. Patients with private insurance had greater median survival time (22, 95% CI: 21-23) than those with Medicaid (14, 95% CI: 13-16) or uninsured (10, 95% CI: 8-12). The five-year GC-specific survival was higher for the private insurance group (33.9%) than for the Medicaid (24.8%) or uninsured (19.2%) group ($p < 0.0001$). In the adjusted model, patients with Medicaid (adjusted hazard ratio [aHR] 1.2, 95% CI: 1.1-1.3) or uninsured (aHR 1.4, 95% CI: 1.3-1.6) had worse GC-specific survival than those with private insurance. In the adjusted model, the odds of late-stage disease presentation were higher in the uninsured (adjusted odds ratio [aOR] 1.6, 95% CI: 1.3-2.1) or Medicaid (aOR 1.3, 95% CI: 1.1-1.6) group than in the private insurance group. Compared with Black patients, Hispanic patients had a greater odds of late-stage disease presentation (aOR 1.4, 95% CI: 1.1-1.7).

Conclusion: Our findings highlight the need for policy interventions addressing insurance coverage among GC patients and inform screening strategies for ethnic minority populations at risk of late-stage disease.

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Impediments to Greater Diversity in the Cancer Research Workforce: Do Patterns of NCI Funding of Training and Educational Awards to Institutions with Rich Research Resources but Low Student Diversity Indicate Structural Bias?

Gonzalez ZJ, Chang S, Primm K, Malabay AJ

Purpose: To examine patterns of NCI training and educational awards (T32 & R25) by indicators of research capacity and student diversity.

Methods: FY2019 data from the US Department of Education and NIH Exporter were used to examine student diversity and NCI funding by research capacity as defined by Carnegie Classification of Institutes of Higher Education.

Results: In FY2019, the Carnegie Classification for Doctoral Universities ($n=412$) included 131 "R1" and 135 "R2" research-intensive universities, and 146 other doctoral and professional universities ("DPU"). At all Carnegie Institutions, $>45\%$ students were White. By Carnegie classes, compared to R2 and DPUs, R1s had the lowest proportions of African American, American Indian/Alaskan Native, Native Hawaiian and Other Pacific Islander, and female students, at both college and graduate levels. Proportions of Hispanic undergraduates were similar across Carnegie classes, and generally higher than those for Hispanic graduate students, which were lowest among R1s relative to R2s and DPUs. Asian American and nonresident alien students (undergraduate and graduate) comprised higher proportions of R1 students than those at R2s and DPUs. Schools varied by Minority Serving Institution status. For instance, numbers of Hispanic Serving Institutions were similar for R1s (16), R2s (16), and DPUs (18), but 11 R2s were Predominantly Black Institutions and only one R1 was and no DPUs. In contrast, 71 R1s were Asian American Serving Institutions, far higher than the 16 R2s and 19 DPUs with that status. Of $>2,000$ "NCI R01 and equivalent awards" in FY2019, $>90\%$ were awarded to R1s, with $<10\%$ at R2s and $<1\%$ at DPUs. Patterns by Carnegie class were similar for NCI Fellowship (F), Career Development (K), and Training Program awards (T).

Conclusion: Both low student diversity at research resource-rich schools and higher diversity at schools with fewer research awards may contribute to and perpetuate few individuals from underrepresented racial and ethnic groups working in cancer research. To address this long-standing problem requires understanding how many factors and systems interact at multiple levels (e.g., individual, institutional, funding agency) to drive and block access to training and career advancement in cancer research.

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Implementation Studio: Implementation Support Program to Build the Capacity of Rural Community Health Educators Serving Immigrant Communities to Implement Evidence-Based Cancer Prevention and Control Interventions

Ko LK, Vu T, Bishop S, Leeman J, Escoffery C, Winer RL, Duran MC, Masud M, Rait Y

Purpose: Rural community-based organizations (CBOs) serving immigrant communities are critical settings for implementing evidence-based interventions (EBIs) to reduce cancer health disparities. The Implementation Studio is a training and consultation program that facilitates the selection, adaptation, and implementation of cancer prevention and control EBIs. The Implementation Studio's content was informed by published capacity building literature and the Putting Public Health Evidence in Action curriculum created by the Cancer Prevention and Control Research Network. We describe the implementation and evaluation of the Implementation Studio on CBOs' capacity to implement EBIs and clients' (immigrant community) knowledge of colorectal cancer (CRC) screening.

Methods: The Implementation Studio curriculum (delivered in English and Spanish) includes five key components: 1) creation of an implementation blueprint, 2) review of EBIs and adaptation to a rural context, 3) stakeholder collaboration and partnership building, 4) training, consultation, and education, and 5) EBI implementation and monitoring. Thirteen community health educators (CHEs) from two CBOs participated in the Studio; both CBOs selected CRC EBIs. The evaluation included two pre-post surveys of (1) CHEs' (n=13) capacity to select, adapt, and implement an EBI and (2) the effect of the CHE-delivered EBIs on clients' (n=44) knowledge of CRC.

Results: All CHEs were Hispanic and women. Pre-post evaluation of the Studio showed a significant increase on CHEs' knowledge of EBIs (pre:29% to post:75%), ability to select EBIs (pre:21% to post:92%), adapt EBIs (pre:21% to post:92%), and implement EBIs (pre:29% to post:75%). Pre-post evaluation of clients showed a significant increase in knowledge including availability of more than one test to detect CRC (pre:11.4% to post:52.3%), the recommended age to begin CRC screening (pre:63.4% to post:70.5%), and screening improving survival (pre:90.9% to post:97.7%).

Conclusion: Implementation Studio provides implementation support that is customized to address unique needs of low resource rural CBOs and has potential to build the capacity of rural CBOs serving immigrant communities to implementation of cancer prevention and control EBIs.

64-T

Implications for Social Isolation and Delay of Cancer Screening and Care during COVID-19 among Sexual and Gender Diverse Populations

Fuller JA, Fisher JL, Paskett ED, Arthur EK

Purpose: The purpose of this study was to examine the association between perceived social isolation (PSI) and delay of cancer screening and care (delay) during the COVID-19 pandemic among sexual and gender diverse (SGD) cancer survivors, and to determine if this association varied by race/ethnicity.

Methods: Data from the National LGBT Cancer Network's OUT: The National Cancer Survey was used. Adult SGD cancer survivors who resided in the U.S. were recruited and administered an online survey in September 2020. Data from participants (N=3,023) who responded to survey questions regarding both PSI and delay were included in the current study. Descriptive statistics were generated, and logistical regression analyses were conducted.

Results: SGD cancer survivors with high PSI were more likely to delay their cancer screening and care in comparison to SGD survivors with low PSI (OR=1.259; 95% CI=1.071-1.479; p=0.005). American Indian, Asian American, Middle Eastern/North African, or Native Hawaiian/Pacific Islander SGD cancer survivors were nearly three times as likely as White SGD cancer survivors to delay (OR=2.91; 95% CI=1.55-5.51; p=0.001). Biracial and multiracial SGD cancer survivors were nearly four times as likely as their White counterparts to delay (OR=3.65; 95% CI=1.58-8.41; p=0.002). Compared to their non-Hispanic peers, Hispanic SGD cancer survivors were more likely to delay (OR=1.42; 95% CI=1.01-1.98; p=0.042).

Conclusion: Our study revealed that efforts to decrease the delay of cancer screening and care in SGD populations should consider the intersections of racial/ethnic and SGD identity. Future research is needed to understand how PSI manifests across the cancer care continuum for SGD populations.

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Increasing Access and Compliance to At-home Colorectal Cancer Screening in Rural Communities Through Online Education and the Postal Service

Ferre N, Harding G, Onega T, Branson D, Apte S, Ulrich C

Purpose: Colorectal cancer (CRC) is the third most common cancer diagnosed in the U.S. Efforts to increase CRC screening rates among rural communities is a priority, where significant CRC disparities exist. Utah has a significant rural population, with only 8% of the landmass designated

as urban. Rural cancer health disparities—often stemming from less education and increased distance between home and care facilities—led Huntsman Cancer Institute (HCI) to address this with National Cancer Institute (NCI) funding. HCI implemented Screen to Save (S2S), with a focus on two interventions to address CRC screening rates: 1) providing and promoting a CRC virtual education module to patients who have recently visited a clinic and are due for CRC screening; 2) upon completion of the education, sending an at-home FOBT kit via mail to patients' homes and facilitating return of the completed test.

Methods: The framework is designed to increase CRC screening rates through informed decision making, with screening messaging framed as a positive action that can be done in the comfort of home. The education component addresses common myths and barriers to completing screening and highlights follow-up needs based on results from the at-home test. The education module includes four parts: 1) demographic information 2) baseline knowledge test 3) interactive video about CRC 4) post-education test. The module is designed to be completed via cell phone, computer, or tablet, online and at the pace the patient prefers or via phone in the absence of internet.

Results: Over a one-year pilot, compliance rates for at-home colorectal cancer screening rose from 14% to 72% at the rural pilot clinic. Furthermore, 100% (14) of patients who received a positive result completed necessary steps to receive a follow-up colonoscopy, where more than half were found to have precancerous polyps. The average score on the baseline knowledge test was 62%, while the post-education test scores were 90%, further demonstrating a dramatic increase in understanding of CRC which corresponds with the substantial increase in compliance rates.

Conclusions: Due to the positive impacts of this study, this framework is now being implemented at several other clinics to address health equity barriers to care.

66-T

Individual and Interpersonal Factors Driving Adolescent HPV Vaccine Uptake among High and Low Acculturated Latinos in a Community at High Risk for Cervical Cancer

Martinez B, Pickering T, Baezconde-Garbanati L, Cockburn M, Palinkas L, Tsui J

Purpose: To identify factors impacting adolescent HPV vaccination in high and low acculturated Latino parents in a community at high risk for cervical cancer.

Methods: Surveys examining HPV vaccine hesitancy in an urban community with low HPV vaccine uptake and high cervical cancer incidence were completed online by parents

of adolescents (N=357). Bivariate logistic regressions examined factors impacting HPV vaccine uptake among Latino adolescents ages 11 and older; the moderating effect of parental acculturation was explored. Multivariable logistic regressions included factors significant at $p < .01$ in bivariate analyses, stratifying by acculturation.

Results: 151 parents of children aged 11 and older identified as Latino; 72% were low acculturated and 28% had high acculturation scores. Factors associated with HPV vaccination in bivariate analyses included: HPV vaccine awareness (OR= 2.8, 95%CI:1.4,5.7), HPV vaccine hesitancy (OR=2.1, 95%CI:0.9,4.9), Tdap uptake (OR= 2.6, 95%CI:1.1,5.7), female parental gender (OR= 2.4, 95%CI:0.8, 6.9), female adolescent gender (OR= 2.5, 95%CI:1.3-4.7), and provider recommendation of HPV vaccination (OR= 17.8, 95%CI:7.9,40.6). Multivariable models including these variables found that parents with low acculturation were more likely to report a child vaccinated against HPV if the parent was female (OR=5.4, 95%CI:1.2,23.9), a provider recommended HPV vaccination (OR=16.3, 95%CI:4.9,53.8), and their children received Tdap vaccination (OR=3.3, 95%CI: 1.1,10.1). Among parents with high acculturation only a provider recommendation of HPV vaccination was significantly associated with increased HPV vaccine uptake (OR=59.5, 95%CI:4.7,746.1).

Conclusions: Our findings align with research identifying provider recommendations as the most important factor impacting adolescent HPV vaccination. It contributes to the literature by confirming the positive impact of provider recommendations among Latino acculturation subgroups, highlighting the need to invest in interventions to improve provider recommendations for HPV vaccination. More education is needed among low acculturated male parents about the importance of HPV vaccination; co-administration with Tdap vaccination presents an opportunity to improve HPV vaccination among this group.

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Informing the Development of a Samoan Healthy Eating, Active Living (HEAL) Program: A Faith-Based Approach

Tanjasiri SP, Tseng W, Ve'e T, Bautista R, Fifita M

Background: Heart disease and cancer are the leading causes of death for Pacific Islanders (PIs) in the U.S., with obesity implicated as a contributing factor to both. In the U.S., PIs experience a high prevalence of obesity. Unfortunately, there are no established evidence-based interventions (EBIs) to improve physical activity and nutritional consumption for cancer prevention in PIs.

Methods: The Samoan Healthy Eating, Active Living (HEAL) project is the first Samoan faith-based study in Northern

California to inform the implementation of developing a culturally-adapted health interventions. We applied the Consolidated Framework for Implementation Research (CFIR) to identify and understand the facilitators and barriers to adopting a physical activity and nutrition EBI. Multi-methods (quantitative and qualitative) were used to assess needs among Samoan adults and intervention ideas among church leaders.

Results: We completed a total of n=71 surveys of adults from one church, and n=8 key informant interviews with pastors, their wives, or other leaders from four churches. Analyses indicated 50% of respondents were physically inactive, 59% ate vegetables and 64% ate fruit less than 5 times a week, and 43% self-reported fair/poor health status. The overwhelming majority of respondents respectively were interested in programs to improve eating habits (89%) and physical activity (95%), with significantly higher interests among older adults. Preference for program engagement were at home (64%), church (41%), or a park/recreation center (41%). Leaders from all four churches agreed that having more health programs were needed, despite half already hosting health and/or wellness programs (e.g., Zumba, gardening, food drives) with major facilitators including strongly leader support and existing health committees within each church. They cautioned, however, that challenges included busy schedules, childcare needs, and COVID fears.

Conclusions: Future action include the tailoring of two existing EBIs for Samoans, and a larger implementation plan to promote adoption and sustainability in Samoan churches across Northern California.

68

Psychosocial Needs and Strengths among Vietnamese American Breast Cancer Patients in Orange County, California

Tanjasiri SP, Nguyen B, Hua D, Nguyen TN, Dong-Matsuda S, Vu A

Purpose: Breast cancer is the most common cancer among Vietnamese American (VA) women in California, and Orange County has the largest population of Vietnamese Americans in the U.S. We used community-based participatory research processes to identify and address the psychosocial needs of VA breast cancer patients within one year of their cancer diagnoses.

Methods: Informed by a 10-member community advisory board, the project held monthly meetings to develop the research protocols and instruments (including qualitative survey and in-depth interview guide), obtain community and university IRB approvals, train community members as interviewers, all throughout the COVID pandemic. Recently

diagnosed VA patients at stages I-III were recruited from a community navigation program that serves women throughout the county and word of mouth.

Results: To date a total of n=41 surveys (out of a total of n=60 planned) were collected, with mean age of 56 years (range 35-81) and the majority of whom were born in Vietnam (97.3%), married (65.8%), and Buddhist (51.2%). Mean distress (measured by the NCCN distress thermometer) was 5.2 with areas of highest need including memory/concentration, appearance, house cleaning, and financial concerns. In addition, 25% and 42.5% scored 3 or higher on the Patient Health Questionnaire-2 and General Anxiety Disorder-2 measures (respectively), indicating high levels of worry and fears. Women at older age did not vary on perceived social support, but they had significantly higher GAD-2 and PHD-2 scores compared to younger women. Qualitative interviews with n=15 women found high social support from family, friends and co-workers, but many participants were reticent to share their diagnoses due to burdening others and themselves (e.g., dealing with others' panicked responses). Stigma and shame were generally not major issues, although selected participants reported self-blame and others self-consciousness from changes in their physical appearances.

Conclusions: Our psychosocial findings are similar to other studies of breast cancer among recently-diagnosed Asian women. VN participants' strengths point to the opportunity to engage supporters in organized, low-contact activities (e.g., house cleaning) that decrease their worries about others.

69-T

Maternal and Paternal Characteristics and Risk of Colorectal Cancer in Adult Offspring: A Population-Based Study of 18,000 Mother-Child Dyads

Dias EM, Murphy CC, Pruitt SL, Krigbaum NY, Cirillo PM, Cohn BA

Purpose: To examine associations between maternal and paternal characteristics at birth and colorectal cancer (CRC) in adult offspring.

Methods: The Child Health and Development Studies is a population-based cohort of women who received prenatal care in Oakland, California and surrounding areas between 1959-1967. Pregnant women reported her and the father's sociodemographic information during in-person interviews at enrollment; the 60-year follow-up enables linking this information with CRC diagnosed in adult offspring through 2021, ascertained from the California Cancer Registry. We used two multivariable logistic regression models to estimate associations of maternal and paternal characteristics and

CRC in adult offspring, including: maternal and paternal education (less than high school [HS] vs. HS or more); maternal (e.g., service) and paternal (e.g., sales) occupation; household income (below \$5,000 vs. above); and maternal nativity (U.S. vs. foreign-born).

Results: Of 18,751 liveborn offspring, 83 were diagnosed with CRC. Offspring of fathers who were craftsmen and foremen (odds ratio [OR] 2.21; 95% confidence interval [CI] 1.09, 4.48) or service workers and laborers (OR 2.17; CI 0.97, 4.90) were two times as likely to be diagnosed with CRC vs. offspring of fathers in professional or managerial positions. There was no association with maternal nativity when measured as U.S. vs. foreign-born (OR 1.31; CI 0.58, 2.97), although risk was higher in offspring of mothers born in Latin America and the Caribbean (Mexico, West Indies [e.g., Cuba], Central or South America) (OR 2.64; CI 0.79, 8.87). There was no association with CRC in offspring and paternal education, low-income households or maternal occupation and education.

Conclusions: Our results suggest that paternal occupation, but not paternal education or household income at offspring's birth increases risk of CRC in adulthood. These findings may be related to environmental exposures (e.g., flame retardants, pesticides) in craft and service occupations. Similarly, mothers born in Latin America and the Caribbean may have been exposed to environmental toxicants that contribute to cancer risk in offspring. Further examination of life-course environmental exposures can guide future cancer prevention efforts.

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Nebraska Community Cancer Needs Assessment: Application of Findings to Guide Community Outreach and Engagement to Address Disparities

Ratnapradipa KL, Dinkel D, Napit K, Robinson T, Schabloske L, McCullough J, Ramos AK, Sallans R, Velasquez N, Watanabe-Galloway S

Purpose: Describe the process and outcomes of using a state-wide cancer needs assessment to engage community organizations and researchers to address cancer disparities and improve cancer outcomes in Nebraska.

Methods: Buffett Cancer Center (BCC) Community Outreach and Engagement (COE) office: 1) conducted focus groups among rural, African American, Hispanic, American Indian, and LGBTQ community members, and 2) analyzed cancer registry and public health survey data to determine the burden and cancer health disparity issues for the Nebraska population. Results were disseminated widely among researchers and community leaders through infographics, presentations, reports, and peer-reviewed articles.

Results: Focus group results indicate that underrepresented community members reported a wide range of barriers to receive timely and quality cancer screening, diagnosis, and treatment. Factors that affect their care seeking behavior differ when comparing rural vs. urban residents and specific racial/ethnic groups. Cancer registry and public health survey findings show a number of disparity issues related to colorectal cancer screening, smoking, and obesity among African American, Hispanic and American Indian residents. The COE office produced individualized reports for recruiting partners and specific population groups as a give-back function so they see the benefit of participating in the future. Cancer researchers and community leaders met and worked together to review the results of the cancer needs assessment to prioritize research and educational focus areas. The group also proposed action steps to reduce cancer disparities among underrepresented population groups. The COE office began implementation of the activities with community and public health partners as well as with BCC researchers.

Conclusions: Cancer needs assessment of the catchment area plays an important role in determining the research and outreach priorities for the population. Ongoing assessment of cancer burden and cancer disparities are needed to guide the cancer center's activities.

71-T

Neighborhood Archetypes and Cardiovascular Health Among Black Breast Cancer Survivors in the Women's Circle of Health Follow-Up Study

Sánchez-Díaz C, Babel RA, Goldman N, Iyer HS, Zeinomar N, Rundle AG, Ambrosone CB, Demissie K, Hong CC, Lovasi GS, Bandera EV, Qin B

Background: Maintaining cardiovascular health (CVH) is critical for breast cancer (BrCa) survivors, who are at risk of cancer-related cardiotoxicity. Poor CVH among Black BrCa survivors likely stem from various area-level social determinants of health, but no study has evaluated the role of neighborhood archetypes in CVH among Black BrCa survivors.

Objective: To characterize neighborhood archetypes in the Women's Circle of Health Follow-Up Study, a population-based study of Black BrCa survivors in New Jersey, and to estimate the association between neighborhood archetypes and CVH as defined by the American Heart Association (7 components: BMI, physical activity [PA], diet, smoking, blood pressure, total cholesterol, and blood glucose).

Methods: Our study included 713 participants diagnosed between 2012-2017 who completed a home interview ~24 months post diagnosis. The CVH score (0-14 points) was summed across all 7 components. Participants' residential addresses at diagnosis were linked to tract-level social,

food, PA environment features. Latent class analysis was used to generate neighborhood archetypes based on 16 features. Multivariate adjusted linear regression model with robust standard errors was used to evaluate the association between archetype membership and CVH score.

Results: We identified four neighborhood archetypes among Black BrCa survivors in our study: 1) higher SES/multi-race, ethnicity/PA, food, healthcare resources [Mixed Urban]; 2) lower SES/ Black residents/food resources [Less-Mixed Urban]; 3) higher SES/multi-race/fewer resources [Mixed Suburb]; and 4) Black residents/fewer resources [Less-Mixed suburb]. 42% of our participants resided in the Less-Mixed Urban neighborhoods and had the lowest CVH score (mean: 7.4 points), serving as the reference group. Women who resided in the Mixed Urban archetype had better CVH (0.75 points higher; 95% CI: 0.32-1.19; $p=0.001$) independent of individual-level factors, while no differences were observed for women in any suburb archetype.

Conclusion: Black BrCa survivors living in the Mixed Urban archetype had the highest CVH scores, but no differences were observed between other archetypes. Residential social and built environments may be crucial for CVH among Black BrCa survivors.

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Perceived Benefits and Harms of Cannabis Use among Cancer Patients Treated at an NCI-Designated Cancer Center

Islam JY, Turner K, Martinez YC, Rodriguez OG, Rodriguez DR, Jim HSL, Egan KM

Background: In the US, cannabis use is growing into a clinical oncology research priority due to its increasingly widespread use among cancer patients. Our objective was to characterize perceived benefits and harms of cannabis use in this population.

Methods: Adult cancer patients who received care between July 2017 and December 2019 at an NCI-designated Comprehensive Cancer Center in Florida were invited to participate in a survey on their use of, and attitudes toward cannabis during cancer treatment. Participants completed the self-administered online survey between August to November 2021. Of the 9,043 patients invited to participate, 1,586 completed the survey (response rate: 17.6%).

Results: Overall, about half of respondents were women (52%) and the majority was over the age of 55 (76%), non-Hispanic White (88%), and diagnosed with early (i.e., Stage I or II) cancer (61%). The most common cancer diagnoses were breast (15%), lung/bronchus (10%), and prostate (7%). A total of 744 (47%) respondents reported using cannabis

at any time since their cancer diagnosis. Overall, 96% of the sample reported perceived benefits of cannabis use and 53% reported perceived risks. Cannabis users were more likely than nonusers to indicate relief of stress, anxiety or depression (90% vs. 80%, $p<0.001$), improved sleep (84% vs. 55%, $p<0.001$), relief of nausea or vomiting (59% vs. 44%, $p<0.001$), increased appetite (66% vs. 49%, $p<0.001$), increased energy or reduced fatigue (25% vs. 14%, $p<0.001$), and decreased use of other medications (50% vs. 33%, $p<0.001$) as perceived benefits of cannabis. Cannabis users were less likely than nonusers to report impaired memory (34% vs. 44%, $p=0.003$), difficulty concentrating (33% vs. 50%, $p<0.001$), addiction to cannabis (22% vs. 44%, $p<0.001$), increased use of other prescribed medications (1% vs. 6%, $p<0.001$) and illicit substances other than cannabis (6% vs. 23%, $p<0.001$), and increased risk of cancer (3% vs. 9%, $p<0.001$) or other diseases (2% vs. 6%, $p<0.001$) as perceived risks. Cannabis users were more likely than nonusers to report lung damage as a perceived risk (48% vs. 42%, $p=0.081$).

Conclusion: Regardless of self-reported cannabis use, large numbers of patients perceived one or more benefits, while fewer reported perceived risks.

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Reasons for Uptake and Discontinuation of Cannabis Use among Patients at an NCI Designated Comprehensive Cancer Center in Florida

Islam JY, Turner K, Martinez YC, Rodriguez OG, Rodriguez DR, Jim HSL, Egan KM

Background: Cannabis use is increasingly recognized as a potential strategy to mitigate adverse symptoms during cancer treatment. Our objective was to evaluate reasons for uptake and discontinuation of cannabis during cancer treatment among patients who self-reported cannabis use following their cancer diagnosis.

Methods: We administered a cross-sectional survey of adult cancer patients who received care between July 2017 to December 2019 at an NCI-designated Comprehensive Cancer Center. We invited patients to participate in a self-administered online survey from August to November 2021.

Results: Overall, 744 (47%) participants reported using cannabis at any time after their cancer diagnosis, which included 70% aged 55 years or above, 54% women, and 87% NH-White patients. Sixty-five percent self-reported to use cannabis at the time of our survey. Among users, the majority (72%) reported cannabis use during their cancer treatment, with more than one-half (51%) reporting frequent use (i.e., more than once a day or once a day; almost every day or more often) during their cancer treatment. Over one-

third (36%) reported no one gives them instructions on how to use cannabis and 24% reported they receive instructions from the cannabis store or dispensary worker. Only 2% reported they received instructions on how to use cannabis from their oncologist. The most common indications reported for cannabis use were difficulty sleeping (61%), pain (56%), and anxiety or depression (53%). Of those with self-reported pain, stress or anxiety, or insomnia, 86%, 81%, and 85%, respectively, their symptoms improved quite a bit or somewhat after using cannabis. Forty-five percent reported stopping using cannabis. The most cited reasons for stopping cannabis use included: cost was too high (38%), cannabis was not covered by insurance (29%), concerns about legal consequences (21%), no recommendation from provider (17%), and not being sure which cannabis products were safe or effective (17%).

Conclusion: Cannabis users report benefits and symptom relief during cancer treatment; however, barriers reported by patients include high costs and lack of reliable information on its use.

74-T

Persistent Poverty and Oral Cavity and Pharynx Cancer Incidence and Relative Survival Rates: A SEER Analysis

Karanth SD, Wheeler M, Yoon AH, Washington CJ, Braithwaite D

Background: In the United States, cancers of the oral cavity and pharynx account for 3% of cancers diagnosed each year. The purpose of the study was to examine incidence and 5-year relative survival rates for persistent poverty counties versus non-persistent poverty counties by race/ethnicity and sex.

Methods: Data on county-level cancer incidence and 5-year relative survival came from the National Center for Health Statistics (NCHS), accessed through SEER*Stat. Analysis was based on data obtained from the SEER database linked to American Community Survey (ACS) data. Persistent poverty is defined by census tracts as persistently poor if 20% or more of the population has lived below the poverty level for a period spanning about 30 years based on ACS. Age-adjusted incidence rate ratios (IRR) were calculated by comparing living in persistent poverty counties to living in nonpersistent poverty counties by sex, separately for each race/ethnic group (non-Hispanic (NH)-White, NH-Black, Hispanic, NH-Asian/Pacific Islander).

Results: We identified 105,103 patients with oral cavity and pharynx cancer diagnosed from 2009-2018. The majority were male (70.5%), NH-White (76.1%), and diagnosed with oral cancers (64.8%). There was a significant trend of higher incidence in counties with persistent poverty for NH-

Blacks (IRR persistent poverty vs. non-persistent poverty counties: 1.46, 95%CI 1.39–1.53; $p<0.0001$) and NH-Whites (IRR poverty vs. non-persistent poverty counties: 1.12, 95%CI 1.08–1.16; $p<0.0001$), while Hispanics had lower incidence (IRR persistent poverty vs. non-persistent poverty counties: 0.91, 95%CI 0.85–0.98; $p<0.001$), and there was no association among NH-Asian/PI patients. The 5-year relative survival among NH-Blacks was lower in persistent poverty counties 41.0% [standard error (SE)=1.4] compared to 54.1% (SE=1.0) in nonpersistent poverty counties; NH-Whites in persistent poverty counties also had lower survival rates of 55.1% (SE=1.2) compared to 69.6% (SE=0.3) in non-persistent poverty counties. Similar survival rates were seen among NH-Asian/PI and Hispanics.

Conclusion: Oral and pharynx incidence and 5-year survival rates were worse among patients living in persistent poverty counties, suggesting the necessity for multilevel research to reduce disparities

75-T

Prevalence of Palliative Care Use and Associated Characteristics among Patients with Stage-IV Breast Cancer – National Cancer Database, 2004-2019

Freeman JQ, Scott AW, Akhiwu TO

Purpose: To estimate the prevalence of palliative care (PC) use and examine associated demographic and clinical characteristics among stage-IV breast cancer patients (pts).

Methods: Data came from the 2004-2019 National Cancer Database (NCDB), a joint project of the Commission on Cancer of the American College of Surgeons and American Cancer Society. Per NCDB, PC, including surgery, radiotherapy, systemic therapy, and/or other pain management, was performed to alleviate symptoms; use was dichotomized as yes/no. Multivariable logistic regression was used to assess the associations between PC use and demographic and clinical characteristics.

Results: Of 137,702 pts (mean age 62 [SD 14] years), 72.6% were White, followed by 16.9% Black, 5.8% Hispanic, and 2.7% Asian; 53.0% were on Medicaid/Medicare and 38.8% had private insurance; 61.4% and 10.4% had ductal and lobular carcinoma, respectively; 61.4% were HR+/HER2-. PC use increased annually during 2004-2019, with an overall 20.2% prevalence. We observed significant differences in race/ethnicity, insurance type, distance to care, Charlson-Deyo comorbidity index (CCI), histologic type, molecular subtype, and receipt of hormone therapy or chemotherapy by PC use. In the adjusted model, Black (adjusted odds ratio [aOR] 0.89, 95% CI 0.85–0.94), Asian (aOR 0.79, 95% CI 0.71–0.88), and Hispanic (aOR 0.67, 95% CI 0.61–0.73) pts had lower odds of PC use than White pts. A CCI of 1 (aOR

1.08, 95% CI 1.02-1.13) or ≥ 2 (aOR 1.24, 95% CI 1.15-1.33) was associated with greater odds of PC use. Compared to Pts with private insurance, those on Medicaid had greater odds of PC use (aOR 1.11, 95% CI 1.05-1.18) while those on Medicare had lower odds (aOR 0.95, 95% CI 0.91-0.99). Pts who received hormone therapy (aOR 1.43, 95% CI 1.36-1.49) or chemotherapy (aOR 1.05, 95% CI 1.01-1.09) had greater odds of PC use than those who did not.

Conclusions: PC use was low among stage-IV breast cancer pts. Demographic and clinical characteristics were independently associated with PC use. Racial/ethnic minorities were less likely to have used PC. Our findings suggest that pts with comorbidities or who received systemic treatment may be in greater need of PC and strategies promoting PC use in racial/ethnic minorities may be needed.

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Poster Withdrawn

77-T

Racial Disparities in Prostate Cancer Mortality Rates Partially Explained by Differences in Dietary and Lifestyle Factors

Sodipo MO, Rencsok E*, Russo RG, Peisch SF, Gerke T, Giovannucci EL, Stopsack KH, Mucci LA*

Introduction: Black individuals have 2.1 times higher prostate cancer mortality rates than White individuals in the United States. Several dietary and lifestyle factors may influence the risk of lethal prostate cancer. This study evaluated to what extent differences in the prevalence of these modifiable risk factors by race could explain racial disparities in prostate cancer mortality.

Methods: We compared the prevalence of seven potentially modifiable risk factors for lethal prostate cancer among Black and White individuals, using the National Health and Nutrition Examination Study at two time points (1988-1994; 2017-2018). Relative risks for lethal prostate cancer were estimated in the Health Professionals Follow-up Study. We calculated the population attributable fraction (PAF) for each factor by self-identified race, defined as the reduction in mortality that would be achieved if the population had been entirely unexposed, compared with the current exposure pattern. We also calculated the difference in the PAF between Black and White individuals, assuming causality of risk factors and no multiplicative effect measure modification by race.

Results: Based on data from NHANES III (1988-1994), the largest prevalence differences between Black and White individuals were for vitamin D deficiency, current smoking,

and coffee, respectively. Elimination of these risk factors among Black individuals could have led to a larger reduction in lethal prostate cancer in comparison to eliminating these same risk factors among White individuals. Given the prevalence of these risk factors in 2017-2018, current interventions on vitamin D deficiency, current smoking, and coffee could influence future PAF differences for lethal prostate cancer mortality among Black individuals compared to White individuals.

Conclusions: Differences in the prevalence of some modifiable lifestyle and dietary factors are potentially responsible for a portion of the racial disparity in prostate cancer mortality.

78-T

Racialized Economic Segregation and Colorectal Cancer Screening in the United States, 2010-2018

Santiago-Rodriguez EJ, Shariff-Marco S, White JS, Bailey ZD, Allen IE, Hiatt RA

Purpose: To evaluate the association between residential segregation and adherence to colorectal cancer (CRC) screening. **Methods:** For adults 50-75 years, National Health Interview Survey data (2010- 2018) were used to ascertain CRC screening adherence according to USPSTF recommendations. Residential segregation was operationalized using the Index of Concentration at the Extremes (ICE), based on income, race and ethnicity information obtained from the 2014-2018 American Community Survey estimates for counties. Four ICE versions were evaluated and consisted of the difference between households with White individuals reporting incomes in the highest quintile of the US distribution, and varying specifications of households with minoritized racial and ethnic individuals (all non-White—people of color [POC], Black, Latino, or Asian American/Pacific Islander) reporting incomes in the lowest quintile, divided by the total of households in the county. Each ICE was subdivided into quintiles (Q1-least advantaged, Q5-most advantaged). Logistic regression models with robust variance estimators accounting for within-county correlation were used. Models were adjusted for age, sex, race, ethnicity, nativity, marital status, SES and year of interview. Analyses were also stratified by race and ethnicity and weighted to represent the US population. **Results:** A total of 44,690 individuals were included, representing 38,192,958 people. In adjusted analyses for ICE POC, individuals residing in less advantaged counties had significantly lower adherence to screening guidelines than those residing in more advantaged counties (OR [95% CI], Q1: 0.78 [0.70-0.87], Q2: 0.76 [0.69-0.84], Q3: 0.84 [0.76-0.93], Q4: 0.90 [0.81-1.00], Q5: reference). The same pattern was observed for all four ICE versions. In stratified analyses, similar findings were obtained for White individuals. Among other racial and ethnic groups, estimates were similar but less precise and included the null.

Conclusion: Racialized economic segregation was associated with lower CRC screening adherence. Interventions aimed at improving CRC screening uptake in the US should consider targeting structural barriers present in areas that have higher concentrations of low-income minoritized racial and ethnic groups.

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Salud en Mis Manos-Dissemination and Implementation Assistance (SEMM-DIA): Developing Online Implementation Strategy Using the Systematic Implementation Mapping Approach

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Purpose: Salud en Mis Manos (SEMM) is an underutilized community health worker (CHW)-delivered intervention proven to effectively increase breast and cervical cancer screening among medically underserved Latinas. To support clinic implementation and dissemination of SEMM, we used the systematic Implementation Mapping planning approach to design and produce the SEMM-Dissemination and Implementation Assistance (SEMM-DIA) implementation strategy. The first 3 planning tasks included 1) conduct a needs and assets assessment and identify intervention adopters and implementers, 2) state implementation and maintenance outcomes, performance objectives, and identify determinants to create matrices of change objectives, and 3) choose theoretical methods and create implementation strategies. Here we describe task 4: design and production of SEMM-DIA.

Method: To create the SEMM-DIA design documentation, the team 1) conceptualized the SEMM implementation flow, 2) categorized and adapted existing SEMM implementation resources (e.g., CHW training, CHW delivery guides) and prepared new protocols, tools, and documentation to support clinic stakeholders' implementation planning, delivery, and process monitoring (e.g., a clinic readiness assessment, Champion training, clinic preparation planning, and field implementation inventory).

Result: The SEMM-DIA design document included specifications for a multifaceted website, as well as external components, including the ECHO tele-mentoring platform and clinic training. To guide clinic managers and CHWs through a 5 step process titled '5 steps to SEMM', the website comprises: 1) Exploration (Prioritizing SEMM), 2) Preparation (Assessing clinic readiness), 3) Preparation for implementation of SEMM, 4) Implementation, and 5) Maintenance. SEMM-DIA comprises resource assets, such as video guides, inventory checklists, the SEMM CHW training curriculum, and intervention guides. The design document guided SEMM-DIA programming.

Conclusion: Implementation Mapping provides a model for developing a multi-component, multi-level user-friendly implementation support strategy to promote feasibility, fidelity and effectiveness of SEMM in clinic settings. Implementation Mapping task 5 will evaluate SEMM-DIA's effect on SEMM's implementation outcomes.

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Social Determinants of Health and Cancer Screening Guideline Adherence among Predominantly Immigrant Communities in New York City

LeCroy MN, Chebli P, Yusuf Y, Foster V, Sifuentes S, Kranick JA, Wyatt LC, Kwon SC, Trinh-Shevrin C

Purpose: To examine the association between social determinants of health (SDH) and cancer screening behaviors in a predominantly immigrant and limited English proficiency (LEP) population in New York City.

Methods: A Cancer Community Health Resources and Needs Assessment survey was administered to 2581 individuals from October 2021 to November 2022 in the catchment area of NYU Langone's Perlmutter Cancer Center (data collection ongoing; analyses will be updated using the final dataset). Recruitment strategies focused on immigrant and LEP communities, including engagement of a multicultural team of community health workers and translation of the survey into 8 languages. Multinomial logistic regression models were used to examine the odds of cancer screening guideline adherence (adherent [reference], non-adherent, unknown) according to SDH. Models were run separately for each SDH and cancer type and limited by age- and sex-based screening criteria. Models were adjusted for age, sex (colorectal cancer only), race/ethnicity, education, and nativity.

Results: Preliminary data show that 43.7% of respondents are food insecure, 15.4% are housing unstable, 17.4% have no insurance, and 50.9% have public insurance. The odds of being non-adherent vs. adherent to colorectal cancer screening guidelines are 1.45 (95% CI: 1.03, 2.04) times greater for individuals with food insecurity compared to individuals with food security. The odds of being non-adherent vs. adherent to cervical cancer screening guidelines are 1.53 (95% CI: 1.05, 2.22) times greater for individuals with housing instability compared to individuals with housing stability. Individuals with no insurance or public insurance also have higher odds of being non-adherent vs. adherent to cervical and colorectal cancer screening guidelines compared to individuals with private insurance. Adherence to breast cancer screening guidelines did not differ according to SDH.

Conclusions: Individuals with unmet social needs are more likely to be non-adherent to colorectal and cervical cancer screening guidelines. Community-focused efforts to address SDH and culturally tailored navigation to healthcare may improve cancer screening rates among a traditionally hard-to-reach population with low cancer screening rates.

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Supporting the Development of Cancer Disparities Researchers - Perspectives from GMaP Region 4

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Purpose: A lack of workforce diversity has been identified as a barrier to improving access to quality care for underserved minority groups, as well as advancing research on health disparities. The Geographic Management of Cancer Health Disparities Program is a national program funded by the National Cancer Institute's Center to Reduce Cancer Health Disparities (CRCHD) whose seven regions use a multipronged engagement approach to increase recruitment/retention of diverse investigators and to strengthen professional development through a variety of programmatic efforts.

Methods: In Fall 2021, GMaP Region 4 took the lead in drafting a National GMaP Feedback Survey to implement across all the GMaP regions with any GMaP member who had engaged with their regional GMaP program via participation in one of its flagship programs (e.g. travel awards, pilot awards) between 2014-2021. It was implemented in Jan-March 2022. Members were asked open ended questions about the direct impact of the award received on their work, how their overall involvement with GMaP was a benefit to their career development, and what resources or career development support would be most useful to them moving forward. Qualitative analysis is ongoing and reveals themes in the areas of: mentor connection, dissertation completion, research skills training, and increasing competitiveness for NIH grants. We also collected CVs to do analysis on subsequent funding awards, publications, and further career appointments that occurred after their GMaP involvement.

Results: Here we report the data collected from Region 4 scholars. We had 46 responses, out of 117 (39.3% response rate) and 33 of 46 (83.2%) stated that they had received NCI Center to Reduce Cancer Health Disparities CURE Funding Awards following their GMaP participation including: Diversity Supplement (13, 40.6%), F31 (3, 9.4%), K01 (13, 40.6%), K08 (1, 3.1%), K22 (3, 9.4%), K23 (1, 3.1%), Workforce Diversity R21 (5, 15.6%). From the CV analysis (39 CVs), following their GMaP participation there were: 90 subsequent funding awards, 312 publications and 69 new appointments.

Conclusions: GMaP's programs are effective to increasing competitiveness of URM scholars as they pursued careers in cancer and cancer health disparities research.

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Telehealth Use among Adolescent and Young Adult (AYA) Cancer Survivors during the COVID-19 Pandemic

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Purpose: Telehealth emerged during the COVID-19 pandemic as a substitute to in-person care. Telehealth has the potential to address access to care disparities, but little is known about telehealth use for populations such as rural adolescent and young adult cancer survivors (AYAs) who have unique healthcare needs. We report on demographic factors associated with telehealth use in Utah-based AYAs during the pandemic.

Methods: Electronic health records for a large academic medical center and cancer registry records were used to identify AYAs diagnosed with cancer age 15-39 between 1986-2020. Participants had at ≥ 1 outpatient healthcare visit from 03/2020-07/2022 (N=5,898). Outcomes: 1) telehealth vs. in-person outpatient visits and 2) telehealth type (video vs. telephone). Logistic regression estimated odds ratios (ORs) and 95% confidence intervals (CIs).

Results: Of AYAs, 63.3% were female. Average age at follow-up start was 40.4(SD=10.9); 15.0% were Hispanic, and melanoma (18.5%) and thyroid (13.8%) cancers were most common. In total, 44.5% had ≥ 1 telehealth visit. White vs. non-White race (OR=1.26, CI:1.16-1.23), public vs. private insurance (OR=1.17, CI:1.12-1.23), female vs. male (OR=1.07, CI:1.03-1.20), and rural vs. urban (OR=1.4, CI:1.33-1.49) were associated with increased odds of telehealth visits. Earlier time from diagnosis (<1 yr vs. 15+ yrs: OR=0.88, CI:0.80-0.96) was associated with lower telehealth odds. For telehealth type, video visits (88.9%) were more common than telephone visits (11.0%). When demographic differences between telehealth types were examined, odds of telephone visits were lower with increasing age (OR=0.98, CI:0.98-0.99). Telephone visits were more common for AYAs who are male (OR=1.36, CI:1.19-1.55 vs. female), and publicly insured (OR=1.98, CI:1.72-2.29 vs. privately insured).

Conclusion: During the COVID-19 pandemic, telehealth saw an increase in use overall, particularly among rural and publicly insured AYAs who traditionally have reported lower access to care. Research on telehealth's impact on AYA cancer survivors and possible trade-offs in access and quality of care from telehealth access are needed.

Testing Colorectal Cancer Screening Distribution in Two Community Pharmacies in North Carolina: Findings from the PharmFIT Study

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Purpose: To develop and test a model for distributing fecal immunochemical tests (FIT) for colorectal cancer (CRC) screening in community pharmacies.

Methods: Working with two community pharmacies and two primary care clinics in North Carolina, we developed protocols for a pharmacy-based CRC screening program (PharmFIT). We conducted collaborative process mapping exercises during project meetings with pharmacists and primary care providers (PCPs) to tailor the program to each pharmacy/primary care context. Two PharmFIT models emerged (Model A and Model B). In Model A, one PCP identified eligible patients and sent e-scripts for patients to pick up FITs at the pharmacy. In Model B, a self-insured employer group notified beneficiaries of FIT availability at the pharmacy. Those interested called the pharmacy and eligibility was determined; those eligible picked up FITs at the pharmacy. In both Models, patients mailed completed FITs to labs for processing. Pharmacists and staff managed reminder calls, tracking (including FIT return), counseling, results reporting, and collected patient demographics. Implementation evaluation surveys were administered to patients, pharmacists, and PCPs.

Results: Patients from Model A were 83% black, 50% had at least some college education, and 56% had Medicaid or Medicare. Twenty-nine e-scripts for eligible patients were sent to the pharmacy, 24 patients picked up the FIT, and 21 completed and returned the FIT (72% response; 88% return). Patients from Model B were 93% white, 100% some college or more, and 93% privately insured. Twenty-five patients contacted the pharmacy of whom 15 were eligible for FIT. Fourteen picked up a FIT, all of whom completed and returned the FIT (93% response; 100% return). In both Models, all FIT results were negative. Pharmacists and PCPs shared considerations for future implementation and scale-up. Survey results from patients (n=30), pharmacy staff (n=3), and PCPs (n=2) indicated high acceptability and satisfaction with PharmFIT.

Conclusion: Tailoring and implementing context-specific protocols for the PharmFIT program resulted in high FIT completion rates, acceptability, and satisfaction among participants, suggesting that it is feasible to expand CRC screening to the community pharmacy setting.

The Association between Health Literacy and Healthcare Delays by Nativity Among Cancer Survivors: An All of Us Cohort Study

Arizpe A, Navarro S, Ochoa CY, Farias AJ

Purpose: Healthcare delays (HcD) negatively impact overall health and increase mortality risk among cancer survivors (CS). CS who reported low health literacy (HL) are more likely to lack understanding of their diagnosis and adhere to follow-up care, promoting poor health outcomes. In addition, nativity (foreign- vs US-born) has been associated with low HL and poor healthcare access. Given that foreign-born individuals may experience lower HL than their US-born counterparts, it is crucial to assess the association of HL and HcD in a US CS sample and exploring nativity differences.

Methods: Survey data from CS collected between May 2018 to April 2021 from the "All of Us"® were analyzed. HcD were assessed by composing a binary measure where those that answered yes to delaying care for any reason (financial, social, and accessibility), were considered to have experienced HcD, whereas those who responded no to all reasons experienced no HcD. HL was assessed using the 3-item Brief Health Literacy Screen, with higher scores indicating better HL (descriptively, scores ≤ 9 represent low HL). Multivariable (age, sex, race, cancer type, nativity, marital, income, education, insurance, housing, and employment status) logistic regression models tested the associations between 1) HL and HcD, and 2) explored differences by nativity.

Results: The sample included a higher proportion of White ethnicity/race (82%) and female (66%) participants, with a median age of 64 years (IQR=17.04). Compared to US-born (n=9042) a greater proportion of foreign-born individuals (n=788) reported more HcD (31% vs 35%), and had lower HL (scores ≤ 9 3% vs 8%). Multivariable analyses showed that for every 1-unit increase in HL there was a 9% (OR=0.91, 95%CI:0.88,0.94, p < 0.001) decreased odds of HcD. This association did not differ by nativity (p interaction=0.17).

Conclusion: This study highlights the possible protective impact of HL on HcD among CS regardless of nativity status. Promoting HL in this population can minimize HcD and ameliorate the negative impacts on the overall health of CS.

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Trends in Endometrial Cancer Incidence by Race/Ethnicity and Age

Rodriguez VR, LeBron AMW, Bristow RE

Purpose: This study used an intersectional approach to examine trends in endometrial cancer (EC) incidence in the United States by race/ethnicity and age.

Methods: Data on EC incidence in the United States between 2000-2019 were from the SEER 17 registries. SEER*Stat software was used to calculate age-adjusted incidence rates by race/ethnicity and age. Rates were adjusted to the 2000 US Standard population. Race/ethnicity was classified into non-Hispanic whites (white), non-Hispanic Blacks (Black), non-Hispanic American Indian/Alaskan Natives (AI/AN), non-Hispanic Asian or Pacific Islanders (API), and Hispanic/Latinos (Latinos). Age of diagnosis was dichotomized into less than 45 years old and 45 years and older. Joinpoint Regression Software was used to calculate annual percent change (APC) and conduct trend analyses of age-adjusted EC incidence by race/ethnicity and age.

Results: Between 2010-2019, there were a total of 215,503 EC cases. During this period, all racial/ethnic groups observed a statistically significant APC in EC incidence. However, AI/ANs observed the highest APC (2.84), followed by Latinos (2.68), Blacks (2.66), APIs (2.60), and whites (0.84). Of important concern, women of all race/ethnicities diagnosed below 45 years old had statistically significant increases in EC incidence, with the greatest APC observed among AI/ANs (4.49) and Latinos (4.29), followed by Blacks (3.22), APIs (2.80), and whites (1.75). Trends for women ages 45 years and older were also statistically significant, with the greatest APC observed among Blacks (2.62), followed by APIs (2.55), AI/ANs (2.49), Latinos (2.45), and whites (0.77).

Conclusions: Historically, EC has largely affected non-Hispanic white and postmenopausal women. However, our results indicate that in the early 21st century EC is impacting more racial/ethnic minority women at younger ages, perhaps due to increases in certain risk factors. Given that there is no screening for EC, careful clinical attention needs to be given to younger racial/ethnic minority women to ensure early diagnosis and treatment. Further, our results show that racial/ethnic minority women represent an important segment of the survivorship population in which future research and interventions should be directed towards.

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Type 2 Diabetes Is Associated with Increased Incidence of Colorectal Cancer among Low SES and Non-Hispanic Black Cohort Participants

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Purpose: Type 2 diabetes and colorectal cancer (CRC) disproportionately burden Americans of lower SES. We evaluated the association between diabetes and CRC risk in a cohort primarily composed of low SES and Black participants.

Methods: Data arose from 74,827 participants of the Southern Community Cohort Study, of which 901 were diagnosed with incident CRC after study enrollment, 68% were non-Hispanic Black, and 56% had household income <\$15,000 at enrollment. Self-reported diabetes status was obtained through questionnaires at enrollment and three follow-up interviews; a subsample comparison with medical records found sensitivity = 96%. Cox proportional hazards were used to calculate hazard ratios (HRs) and 95% confidence intervals (CIs) for associations between diabetes and CRC risk. Statistical models included adjustment for enrollment source, race, sex, screening history, health insurance status, smoking, education, income, alcohol, BMI, and family history of CRC.

Results: Approximately 36% of the cohort reported prevalent or incident diabetes during the study period and the frequency was higher among participants with lower household income. Diabetes was associated with increased incidence of CRC where prevalent diabetes at baseline was associated with HR of 1.34 (95%CI:1.14,1.57). Analyses restricted to participants eligible for CRC screening and who reported undergoing screening for CRC and diabetes showed stronger associations between prevalent diabetes and increased CRC risk (HR=1.52; 95%CI:1.11,2.07). Associations were consistent across anatomic site where the prevalent diabetes HR for colon cancer was 1.37 (95%CI:1.14,1.64) and 1.24 (95%CI:0.89,1.73) for rectal cancer. Incident diabetes was also associated with increased CRC risk, although the strength of association was attenuated (HR=1.12; 95%CI:0.97,1.29). The positive association was strongest among participants diagnosed with diabetes within five years of incident CRC. Associations did not differ by sex, race, BMI or smoking status.

Conclusions: Our findings support an association between diabetes and increased CRC risk. Public health interventions focused on low SES populations may decrease disparities in diabetes and CRC.

Understanding African American lowans' Experiences in Healthcare, and How Those Experiences Shape Cancer Prevention and Control Behaviors

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Purpose: Black and African American lowans experience higher mortality from each leading cancer compared to lowans of other races. The purpose of this pilot research was to conduct community-engaged research to understand and address the disparate burden of cancer among Black and African American lowans.

Methods: In collaboration with our community partners (AV; and, members of the Black Hawk County Steering Committee), we identified a need to understand how experiences in the healthcare system, specifically experiences of racism, impact individuals' desire and ability to engage in cancer prevention and control behaviors. We conducted twenty semi-structured interviews with African American lowans mostly living in Black Hawk County during summer 2022. Interviewees were recruited by our Community Co-I (AV) using a snowball sampling method. Interview questions focused on attitudes towards and experiences in the healthcare system, medical (mis)trust, and engagement with cancer screening. Interviews were transcribed, coded, and thematic analysis conducted.

Results: Several themes were identified in our analyses of interview transcripts. Barriers to engagement in cancer prevention and control behaviors included: cultural stigma; everyday racism and racism in healthcare; medical mistrust; poor communication; the need to be heard; and, the need for sustainable community interventions. Facilitators to engagement include the ability to choose in healthcare; and, the ability to seek care outside the local setting.

Conclusion: This study identified barriers and facilitators to engaging in cancer prevention and control behaviors among African American lowans, indicating areas for potential interventions. Community engagement played a key role in identifying priorities and shaping the directions of this work. Next steps include an environmental scan, and data sharing with community members to identify future research opportunities.

Understanding the Role of Access in Hispanic Cancer Screening Disparities

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Background: Hispanic populations in the US experience numerous barriers to care access. It is unclear how access differences are associated with disparities in cancer screening use.

Objective: Understand the extent to which cancer screening disparities between Hispanic and non-Hispanic White individuals are explained by access to care – including having a usual source of care and health insurance coverage.

Methods: We conducted a secondary analysis of the 2019 National Health Interview Survey, including respondents who were sex- and age-eligible for cervical (n=8,316), breast (n=6,025), or colorectal cancer screening (n=11,313). We compared proportion ever screened and up to date for each screening type. We performed serial regression to examine whether controlling for reporting a usual source of care and type of health insurance (public, private, none) attenuated disparities between Hispanics and non-Hispanic White individuals.

Results: Hispanic individuals were less likely than non-Hispanic White individuals to be up to date with cervical cancer screening (71.6% vs. 74.6%) and colorectal cancer screening (52.9% vs. 70.3%), but up-to-date screening was similar for breast cancer (78.8% vs 76.3%). Hispanic individuals (vs. Non-Hispanic White) were less likely to have a usual source of care (77.9% vs. 86.0%) and more likely to be uninsured (23.6% vs. 7.1%). In regressions, insurance fully attenuated cervical cancer disparities. Controlling for both usual source of care and insurance type explained around half of the colorectal cancer screening disparities (adjusted risk difference: -8.3 [-11.2,-4.8]).

Conclusion: Addressing the high rate of uninsurance among Hispanic individuals could mitigate cancer screening disparities. Future research should build on the relative successes of breast cancer screening and investigate additional barriers present in colorectal cancer screening.

Associations of CD44, CD24, and ALDH1A1 Expression in Benign Breast Biopsies with Subsequent Breast Cancer Risk

Yaghjian L, Heng J, Baker G, Murthy D, Mahoney M, Rosner B, Tamimi R

Purpose: The stem cell hypothesis of breast carcinogenesis suggests that breast cancer development might be directly related to the size of the stem cell pool and its mitotic activity. We examined the association between stem cell markers CD44, CD24, and ALDH1A1 in benign breast biopsies and breast cancer risk.

Methods: This study included women with biopsy-confirmed benign breast disease from a nested case-control study within the Nurses' Health Study (NHS) and NHSII. The data on breast cancer risk factors were obtained from biennial questionnaires. Immunohistochemistry (IHC) was conducted on tissue microarrays with commercial antibodies (CD44 [DAKO] 1:25; CD24 [Invitrogen] 1:200 and ALDH1A1 [Abcam] 1:300). For each core from normal terminal duct-lobular units, the percent positivity was quantified by the Definiens Tissue Studio. For each core, the extent of each marker's expression was assessed on a continuous scale as % of cells that stain positively (across all intensities) for a specific marker out of the total cell count, separately for epithelium and stroma. All analyses were limited to cores with at ≥ 50 cells of specific tissue type (epithelium or stroma) from Definiens readings. The associations were examined with logistic regression (with the risk estimates for staining $\geq 10\%$ vs. $< 10\%$), while adjusting for breast cancer risk factors.

Results: In our study, IHC readings were available for 94 cases/329 controls for CD44, 96 cases/339 controls for CD24, and 96 cases/330 controls for ALDH1A1. In multivariate analysis, stromal expression of CD44 was inversely associated with breast cancer risk (Odds Ratio [OR] for ≥ 10 vs. $< 10\%$ = 0.57, 95% CI 0.33, 0.97). Stromal expression of CD24 and ALDH1A1 was not associated with breast cancer risk (OR = 0.84, 95% CI 0.48, 1.48 and OR = 0.79, 95% CI 0.47, 1.32, respectively). We found no association of epithelial expression of any of the three markers with breast cancer risk (p-trend > 0.17 for all).

Conclusions: Contrary to our hypothesis, the findings suggest an inverse association between stromal CD44 expression and breast cancer risk. Future studies are warranted to confirm our findings and to elucidate the underlying biological mechanisms.

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Association of Air Pollution with Breast Cancer Risk in UK Biobank

Smotherman C, Sprague B, Datta S, Braithwaite D, Qin H, Yaghjian L

Purpose: We investigated the association of several air pollution measures (particulate matter PM₁₀, PM_{2.5}, PM_{2.5-10}, PM_{2.5} absorbance, nitrogen dioxide [NO₂], and nitrogen oxides [NO_x]) with postmenopausal breast cancer (BCa) risk.

Methods: This study included 155,235 postmenopausal women (6,146 with BCa) from UK Biobank, a population-based prospective cohort. Cancer diagnoses were ascertained through the linkage to the UK National Health Service Central Registers. Annual averages for NO₂ were available from 2005 and baseline assessment (2006, 2007, and 2010). Annual averages for PM₁₀ were available from 2007 and 2010. For other air pollution measures (PM_{2.5}, NO_x, PM_{2.5-10} and PM_{2.5} absorbance), annual averages were available from 2010. We examined associations for year-specific and cumulative average exposure measures. Information on BCa risk factors was collected at baseline. We used Cox proportional hazards regression to evaluate associations between air pollution (continuous per 5 $\mu\text{g}/\text{m}^3$ as well as quartiles) and BCa risk, while adjusting for BCa risk factors. We also examined the associations with 2-year exposure lag.

Results: BCa risk increased by 9% per 5 $\mu\text{g}/\text{m}^3$ increase in 2007 PM₁₀ (Hazard ratio [HR] = 1.09, 95% CI 1.04, 1.14), and by 41% per 5 $\mu\text{g}/\text{m}^3$ increase in cumulative average PM₁₀ (HR = 1.41, 95% CI 1.32, 1.51). Compared to women with annual concentrations of 2007 PM₁₀ in the 1st quartile, women with higher levels had higher BCa risk (HR = 1.17, 95% CI 1.09, 1.26 for 2nd quartile, HR = 1.14, 95% CI 1.06, 1.23 for 3rd quartile, and HR = 1.15, 95% CI 1.07, 1.24 for 4th quartile, p-trend = 0.001). We found no association for 2010 PM₁₀, but cumulative average PM₁₀ exposure was positively associated with BCa risk (4th versus 1st quartile HR = 1.35, 95% CI 1.25, 1.44, p-trend < 0.0001). No significant associations were found with any other air pollutant and BCa risk. Compared to the overall analyses, in the analyses with 2-year exposure lag, we observed stronger associations for PM₁₀ in 2007 (HR per 5 $\mu\text{g}/\text{m}^3$ = 1.11, 95% CI 1.06, 1.16), and a weaker association for PM₁₀ cumulative average (HR per 5 $\mu\text{g}/\text{m}^3$ = 1.36, 95% CI 1.27, 1.47).

Conclusions: We found a positive significant association of PM₁₀ exposure in 2007 and cumulative average PM₁₀ exposure with postmenopausal BCa risk.

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Barriers and Facilitators to Follow-Up for Women Who Tested Positive for High-Risk HPV Using a Self-Sample Kit during the COVID-19 Pandemic

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Purpose: At-home self-sample human papillomavirus (HPV) tests are an alternative screening strategy for individuals underscreened for cervical cancer, but barriers and facilitators to follow-up among those who test positive for high-risk (HR-) HPV are relatively unknown.

Methods: Data were collected as part of the PRESTIS (Prospective Evaluation of Self-Testing to Increase Screening) trial. Trial participants are women enrolled in a public safety net health system, ages 30-65 years, and underscreened for cervical cancer. We conducted semi-structured telephone interviews of 10 English-speaking participants who received positive HPV results after completing at-home self-sampling. We coded interview transcripts and analyzed them using a grounded theory approach.

Results: Participants either attended their follow-up (n=6), scheduled their follow-up (n=3), or didn't attend their follow-up (n=1). Participants reported COVID-related barriers to follow-up, including delayed appointments due to COVID-19 infection and fear of acquiring COVID-19 when attending for follow-up. Lack of time constraints was a commonly reported facilitator among those who attended for follow-up. Additionally, self-motivation driven by fear of developing cancer and taking responsibility for personal health was an internal factor that influenced a participant's decision to attend their follow-up.

Conclusion: COVID-19 was an important barrier to follow-up among women who received a positive self-sample HPV test. Despite being previously under screened for cervical cancer, participants were highly motivated to attend their clinical follow up due to internal and external factors. Further research is needed to better understand these barriers and facilitators to follow-up for future implementation of HPV self-sample kits.

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Fear of Cancer and HPV as Barriers to Clinic- and Home-Based Cervical Cancer Screening among Underscreened Women in a Safety Net Healthcare System

Parker SL, Amboree T, Daheri M, Escobar B, Chiao EY, Anderson ML, Deshmukh AA, Hilsenbeck SG, Schmeler K, Jibaja-Weiss ML, Bulsara S, Zare M, Scheurer ME, Montealegre JR

Purpose: Many structural and individual-level barriers to cervical cancer screening are addressed by at-home self-sample human papillomavirus (HPV) testing. However, psychosocial barriers, including fear of cancer and HPV disease, may continue to hinder screening participation. Here we assess fear of finding cancer and HPV as reasons for non-participation in self-sampling, which was conducted as part of a pragmatic trial.

Methods: Mailed self-sampling kits were offered to underscreened patients as part of the pragmatic Prospective Evaluation of Self-Testing to Increase Screening (PRESTIS) trial. We conducted telephone surveys in English and Spanish among a subgroup of trial participants. The survey assessed barriers to clinic-based screening, acceptability of self-sampling, and reasons for using or not using the mailed kits.

Results: Most surveys (n=243) were conducted in Spanish (63%). Almost half (43.2%) of participants reported fear of finding cancer as a reason for not completing clinic-based screening (Pap), and this barrier was significantly more prevalent among Spanish- versus English-speaking participants (52.9% vs 26.7%, respectively; $p<0.01$). Similarly, about one-third (33.7%) of women reported fear of finding HPV as a reason for not completing clinic-based screening, with significantly more Spanish- versus English-speakers reporting this barrier (42.5% vs 18.9% respectively, $p<0.01$). Among women who reported not using the at-home self-sample HPV kit (n=31), fear of finding cancer (67.7%) and fear of finding HPV (46.7%) were common reasons for not using the kit, with no statistically significant differences between language-use groups.

Conclusions: Fear of finding cancer and HPV are important barriers to both clinic- and home-based cervical cancer screening among underscreened safety net health system patients, especially among Spanish-speaking patients. Further research is needed to address fear of cancer and HPV as barriers to participation in both clinic- and home-based screening programs.

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Changes to Screening Recommendations and Their Impact on Breast Cancer Incidence by Stage in Young Women

Lee AW, Phung MT, Peters M

Purpose: In November 2009, the United States Preventive Services Task Force (USPSTF) recommended against clinicians teaching women how to perform breast self-examinations (BSEs). This change largely impacts young women (i.e., age <40 years) who currently have no breast cancer screening guidelines. Since young women are more likely to be diagnosed with advanced stage breast cancer, we examined whether there were differences in breast cancer incidence by stage in young women before and after this change in USPSTF screening recommendations.

Methods: We used data from the United States Cancer Statistics, which includes cancer surveillance data from the Centers of Disease Control and Prevention's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results Program. Age-adjusted incidence rates for breast cancer in women age <40 years by stage (i.e., in situ, localized, regional, distant) were calculated for the 2005-2009 and 2011-2015 time periods and compared using incidence rate ratios (IRRs) and 95% confidence intervals (CIs).

Results: Compared to 2005-2009 (i.e., before the recommendation), the proportion of distant breast cancer among young women in 2011-2015 (i.e., after the recommendation) increased from 5.65% to 6.65% while the proportion of in situ carcinoma decreased from 13.18% to 11.74% ($p < 0.0001$). In addition, after the guideline change, the incidence rate of distant breast cancer increased by 18% (IRR=1.18, 95% CI 1.12-1.23) while the incidence rate of in situ carcinoma decreased by 10% (IRR=0.90, 95% CI 0.87-0.93).

Conclusions: There was a higher incidence of distant breast cancer in young women after the USPSTF recommended against BSE instruction. This may be due to delays in breast cancer diagnosis given that this guideline change could have resulted in fewer educational conversations about breast cancer between young women and their providers although temporal changes in breast cancer risk factors and stage classification are certainly possible. More research to identify subgroups of young women who may benefit the most from BSE instruction (e.g., those with a family history, risk factors) is warranted.

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Characteristics of Lung Cancer Screening Eligible Population in the U.S and Prediction of the Eligibility with Simplified Criteria

Zhang L, Okon M, Williams J, Truong K, Yu Q, Griffin S

Purpose: In 2021, the guidelines for lung cancer screening (LCS) were updated, expanding LCS eligible population to younger people and those with lower lifetime smoking intensity. Lifetime smoking intensity is essential to determine LCS eligibility, however it is usually unavailable in electronic health records, which is a barrier of LCS implementation. With the updated guidelines, this study aimed to 1) estimate the proportion and examine characteristics of individuals eligible for LCS among people aged 50-80 years in the U.S.; 2) evaluate the performance of five simplified criteria in estimating LCS eligibility among population aged 50-80 years and subpopulations defined by sex, race/ethnicity, and education.

Methods: Participants of National Health and Nutrition Examination Survey (NHANES) 2013-2018 aged 50-80 years who answered smoking questionnaire were included. The 2021 LCS guidelines were used, i.e., age 50-80 years, current or former smoker quitting smoking within 15 years, with ≥ 20 pack-years. Five simplified criteria were: 1) ever smoker; 2) current or former smoker quitting smoking within 15 years; 3) current smoker; 4) current smoker with >0.5 pack per day (ppd); 5) current smoker with >1 ppd. Sensitivity, specificity, positive predictive value (PPV), negative predictive value, and accuracy were calculated for each simplified criterion. Complex survey design was considered.

Results: About 16.7 million individuals (representing 16.0% of population aged 50-80 years) were eligible for LCS in the U.S. The percentage of LCS eligibility was higher among people who were younger, male, non-Hispanic White, less educated, single, not insured, with poorer health status and lower socioeconomic status. The five criteria had sensitivity ranging from 0.08 to 1.00, PPV from 0.35 to 1.00, and accuracy from 0.70 to 0.91. The performance of the five criteria did not vary significantly among subpopulations.

Conclusions: Individuals with less favorable social and clinical characteristics are associated with higher chances of being eligible for LCS, which could exacerbate disparities in LCS utilization. Simplified criteria can be used as prescreening tools to identify target populations, which could facilitate LCS implementation at population level.

Combined Use of Competing Risk Model and Whole Mammogram Image Data Improves Second Breast Event Prediction After Initial DCIS Diagnosis

Jiang S, Colditz GA

Purpose: Classifying risk of second breast events (after ductal carcinoma in situ (DCIS) remains a challenge. Contralateral events are often ignored or censored. To address gaps in risk classification we 1) assess the improvement in accuracy with the inclusion of contralateral breast events in predicting the risk of future breast events; 2) quantify the value of using the whole mammogram image using the FPCs extracted from both breasts to predict the risk of future breast events and; 3) quantify the value of using both the competing risk model and whole mammogram image in combination.

Methods: From the St. Louis registry of breast cancer (DCIS and invasive cancer), we identified 74 women with subsequent events at least 6 months after the initial diagnosis of DCIS. We matched women of the same age with DCIS diagnosed in the same year resulting in a total of 185 women for analysis. Breast cancer risk factors and mammograms (Hologic) are available at entry from prospectively collected breast screening records. We evaluate the improvement in accuracy of different approaches to handling competing events when predicting 5-year risk of a second breast event, either pathology confirmed DCIS or invasive breast cancer. We repeat competing risk analysis adding whole breast image.

Results: Both censoring and ignoring the competing breast events led to a substantial bias in model estimation. The 5-year prediction accuracies summarized as AUC are significantly improved when competing risk model is adopted (ipsilateral improved from 0.51 to 0.61 and contralateral from 0.52 to 0.65). In the fully adjusted model, the AUC was significantly improved for contralateral events from 0.65 for age and WMI to 0.75 ($P < 0.01$).

Conclusion: The competing risk model improves prediction performance and reduces bias for both ipsilateral and contralateral breast events among women with DCIS. The addition of the whole mammogram image can significantly improve the second contralateral event prediction. This approach can better inform precision medicine decision-making and subsequent clinical trial design.

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Data-Driven Prediction of Early-Onset Colorectal Cancer using Electronic Health Records and Machine Learning

Xu J, Mobley EM, Quillen MB, Parker M, Awad ZT, Daly MC, Fische JN, Parker AS, George TJ, Bian J

Purpose: To build prediction models that identify patients at higher risk of developing early-onset colorectal cancer (CRC) prior to 50 years of age with electronic health record (EHR) data using machine learning (ML) techniques.

Methods: We obtained EHR data from the OneFlorida+ Clinical Research Consortium and extracted demographics, diagnoses, vitals, medications, medical procedures, and lab tests. Diagnoses were mapped to PheWas groups and medications were mapped to the ingredient level. We encoded all categorical features using the one-hot encoding scheme. Prediction models were built separately for the two outcomes: colon cancer (CC) or rectal cancer (RC). Cases and controls were matched 1:5 using propensity score matching. We defined prediction windows at 0, 1, 3, and 5 years prior to the index date (i.e., the first CRC diagnosis date). We tested two common ML methods: logistic regression (LR) and Gradient boosting Tree (GBT). We applied the SHAP (SHapley Additive exPlanations) approach to identify the risk factors that contributed to the prediction of CRC diagnosis and evaluated the performance using AUC, sensitivity, and specificity.

Results: A total of 751 CC and 249 RC patients were included. Patient data from the 0-year prediction window before early-onset CRC diagnosis using the GBT model showed the best results (CC: AUC [95% CI] = 0.792 [0.788, 0.795], sensitivity [95% CI] = 0.656 [0.642, 0.670], specificity [95% CI] = 0.804 [0.791, 0.817]; and RC: AUC [95% CI] = 0.828 [0.822, 0.834], sensitivity [95% CI] = 0.700 [0.683, 0.718], specificity [95% CI] = 0.857 [0.842, 0.872]). There were some differences in the risk factors among different prediction windows, and the top ranked risk factors included essential hypertension, diabetes, obesity, and renal dysfunction (e.g., acute renal failure, abnormal creatine). Preventive care such as routine medical exam is negatively associated with the risk of CRC. This may due to preventive care is a surrogate marker for social determinants of health.

Conclusions: Leveraging ML models with EHR data can help predict the risk of early-onset CRC. Future work should externally validate the proposed model and features to better guide clinical support of those who may be at risk of developing early-onset CR

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Disparities in Prostate-Specific Antigen Testing by Race and Ethnicity in the All of Us Research Program

Morley F, Rebbeck TR, Kensler KH

Purpose: Given the large differences in prostate cancer incidence and mortality across racial and ethnic groups in the U.S., we sought to describe disparities in prostate-specific antigen (PSA) testing within the All of Us (AoU) Research Program.

Methods: AoU is a nationwide cohort study intended to accelerate biomedical breakthroughs for populations that have been traditionally underrepresented in medical research. Within AoU, we identified a cohort of 41,250 males ages 40-85 without a history of prostate cancer or prostatic disease at time of enrollment who had at least one condition, observation, or procedure code in their linked electronic health record (EHR). PSA tests were identified using CPT, LOINC, and SNOMED codes in the linked EHR data from study enrollment in 2017-2021 through the end of follow-up in 2021. Incidence rate ratios (IRR) for the number of PSA tests received over follow-up were estimated using negative binomial regression models, adjusting for factors that influence healthcare access and utilization. The proportion of men in AoU who received a PSA test within two years was compared against estimates from the 2020 Behavioral Risk Factor Surveillance System (BRFSS).

Results: A total of 6,421 participants (15.6%) received a PSA test over the follow-up period. Age, education, employment, insurance status, income, housing, family history of prostate cancer, body mass index, and geographic region were all associated with PSA testing rates in multivariable-adjusted models. In multivariable-adjusted models, non-Hispanic Black men had 22% fewer PSA tests (IRR=0.78, 95% CI 0.72-0.85), while rates did not significantly differ for other racial and ethnic groups, relative to non-Hispanic White men. The proportion of men receiving a PSA test within two years was lower in AoU relative to the BRFSS for non-Hispanic Black (8.2% AoU vs 24.1% BRFSS), Hispanic (9.4% vs 23.4%), non-Hispanic Asian/Pacific Islander (14.5% vs 19.4%) and non-Hispanic White (16.2% vs. 29.5%) men.

Conclusion: In the AoU Research Program, PSA testing rates were lower among non-Hispanic Black men relative to men of another race or ethnicity. Testing frequencies in AoU were substantially lower than population-level estimates, in part reflecting incompleteness of the AoU EHR data.

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DXA-Derived Abdominal Visceral and Subcutaneous Adipose Tissue and Postmenopausal Colorectal Cancer Incidence

Ziller S, Lind K, Blew R, Jacobs E, Odegaard A, Caan B, Chen Z, Luo J, Manson J, Neuhaus M, Rohan T, Bea J

Purpose: We aimed to determine if dual-energy X-ray absorptiometry (DXA) derived abdominal visceral and subcutaneous adipose tissue (VAT;SAT) were associated with incident colorectal cancer (CRC) in postmenopausal women from the Women's Health Initiative Bone Mineral Density/DXA Cohort (n=11,405).

Methods: Baseline whole-body DXA (Hologic QDR2000/QDR4500, APEX 4.0 software) scans were used to estimate abdominal VAT, SAT, and total adipose tissue (TAT). Women with a history of cancer (except non-melanoma skin cancer), data missing for baseline DXA, or missing cancer history were excluded (n=1,455). From enrollment up to 27 years of follow-up, cancer outcomes were adjudicated. Descriptive statistics stratified by quartiles of VAT/SAT ratio were calculated, and t-test and chi-square comparisons were completed. Fine and Gray's competing-risks regression was used to estimate the association between baseline body composition and first incident CRC. Observation time started at enrollment and ended at first CRC event or competing risks (other cancer first, death without cancer); women surviving without cancer at last follow-up were censored. Covariates included age, height, race/ethnicity, education, physical activity, physical function, diet, family history of cancer, WHI trial arm, and relevant medications. Multiple imputation using chained equations was used to address missing covariates.

Results: After exclusions, 9,950 women were included, with 191 women having a first incident CRC during follow-up. The mean age at WHI baseline was 63.25 (ff17.37) years, and mean body mass index (BMI) was 28.20 (ff15.72). In unadjusted models, continuous baseline measurements of VAT, VAT/SAT ratio, and TAT were significantly associated with increased risk of incident CRC with Sub-Hazard Ratios (SHR) and 95% confidence intervals (CI) of 1.23 (1.04-1.45), 1.09 (1.01-1.17), and 1.08 (1.01-1.16), respectively. In adjusted models, only continuous baseline VAT remained significantly associated with incident CRC: SHR (95% CI): 1.22 (1.01-1.49).

Conclusion: Abdominal VAT was associated with an increased risk of incident CRC in postmenopausal women.

Evaluating a Colorectal Cancer Screening Quality Improvement Intervention among Primary Care Patients

James J, McNair C, Trammell R, Bath A, McGowen C, Young Pierce J

Purpose: The purpose of this study was to pilot a video intervention to motivate patients to discuss and undergo colorectal cancer (CRC) screening (either a stool-based test or colonoscopy).

Methods: Primary care patients ages 50-75 scheduled for routine visits and overdue for CRC screening (no stool-based test in the past year, flexible sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years) were eligible. Patients with a history of CRC or polyps were excluded. After consenting, patients viewed a 5-minute educational video adapted from CHOICE (Communicating Health Options through Interactive Computer Education, v7, © 2005 Kim et al) about CRC screening. Patients completed pre- and post-video REDCap questionnaires to compare subjective measures of video content, screening interest, and intent. Patients indicated their screening decision using a color-coded visual aid given to their provider to spark discussion. Electronic medical records (EMR) were screened to see if CRC screening was discussed and completed. Pre- and post-questionnaires were compared using frequency data. Screening interest and intent questions used a Likert scale.

Results: 38 patients were eligible, mean age 60. The patients were 66% female; 47% each were Black and White; 3% each were Asian and Hispanic/Latino. 32 patients completed both surveys, with 45% having had prior CRC screening discussion. There was a 13% increase in patients interested in having CRC screening within the next 6 months; 28% increased in intent to talk to their doctor about it. On the visual decision aid, 61% of patients were ready to act and 18% were contemplating action. 87% of patients discussed CRC screening with their provider after the video. 6 months post-intervention 21% of participants had completed CRC screening with 3 more completions at 12 months (29% total). 40% said they preferred FIT but 82% of CRC-screened patients opted for a colonoscopy.

Conclusions: Patients had an increase in interest in having CRC screening and intent to discuss it with their provider after viewing the adapted CHOICE video. Using patient navigation with an educational video may help motivated patients follow through with CRC screening in the future.

Examination of Targetable Mutations by Smoking Status in The Cancer Genome Atlas (TCGA)

Arasada R, Harris R, Carbone DP, Bittoni M

Purpose: The Cancer Genome Atlas (TCGA) database provides publicly available genomic data for many cancers. This report describes predictive models examining smoking status, demographic, and clinical factors, including race, age, gender, stage and vital status, and their associations with several lung cancer specific mutations, such as ALK, EGFR, ROS1, RET and KRAS.

Methods: The data source for this study was the TCGA database, in which data from 522 histologically confirmed lung cancer cases (adenocarcinoma) were analyzed using multiple logistic regression to examine associations between genetic alterations (ALK, ROS1, EGFR, KRAS and RET) by smoking status (current, former, never) and gender, race, age at diagnosis, vital status and stage.

Results: Of 522 cases, over half were female, 86% were white, with mean age 66 years, and 61% former smokers, 23% current smokers and 16% who never smoked. Adjusted logistic regression models revealed almost a 5-fold increased odds of EGFR for nonsmokers (versus current and former smokers; $p < 0.001$), and almost a 2-fold increased odds for males ($p < 0.05$). White race showed a 2.5 higher odds of ALK mutation, which approached significance ($p = 0.07$), with former and current smokers showing a 3- and 4-fold increased odds of EGFR, respectively ($p < 0.05$). Current smokers showed a 6.5 higher odds of ROS1 mutation versus nonsmokers ($p = 0.004$). Similarly, current and former smokers exhibited a 3- and 5-fold increased odds of KRAS mutation, respectively, versus nonsmokers ($p < 0.05$). No significant differences were found for RET mutation.

Conclusions: This report showed diverse patterns of association between smoking and lung cancer-related mutations. Never smokers had a higher odds of EGFR, which is consistent with past findings, but current and/or former smokers showed a strong increased odds of developing most other mutations. White race showed potential associations with ALK only and males showed associations with EGFR. Overall, these results shed new light on current, former and never smoking as possible predictive factors for several genetic alterations, which has implications for treatment and warrants further research. Future research with larger, more diverse populations is needed to further refine and quantify these results

Frequency and Predictors of Screening Breast MRI during the COVID-19 Pandemic: A Retrospective, Chart-Review Study

Sivanushanthan S, Wu T, Wahl A, Li T, Luta G, Song JH, O'Neill SC, Conley CC

Purpose: The COVID-19 pandemic affected cancer screening. This study examined frequency and demographic/clinical predictors of screening breast MRI during the COVID-19 pandemic.

Methods: Retrospective electronic medical record (EMR) review identified breast imaging encounters (screening mammogram or breast MRI) between March 13–December 31 in 2019 or 2020 for female patients ages 18–85. To identify and remove diagnostic breast MRIs from our analytic sample, members of the study team reviewed breast MRI orders for diagnostic indications (e.g., implant rupture, breast complaint, etc.). We also excluded participants with a diagnosis of in situ or invasive breast cancer within 5 years of the imaging procedure. First, a logistic regression model with generalized estimating equations examined whether timing of visit (pre-COVID=0, during COVID=1) was associated with receipt of breast MRI (yes=1, no=0). Then, exact logistic regression models examined whether demographic (i.e., age, race, ethnicity, insurance status) and clinical (i.e., family history of breast cancer) factors were associated with receipt of breast MRI during COVID (yes=1, no=0) among participants who had received a breast MRI pre-COVID.

Results: Data included 30,106 visits from 24,128 unique patients (1–3 visits/patient). Our institution averaged 19 screening breast MRIs per month in 2019 and 8 screening breast MRIs per month in 2020. Odds of having a screening breast MRI were significantly lower during COVID (OR=0.76 [0.61, 0.94], $p=0.011$). Of the 179 patients who had received a screening breast MRI pre-COVID, only 15 (8%) also had a screening breast MRI during COVID. No demographic or clinical factors were significantly associated with receipt of screening breast MRI during COVID (all p 's > 0.37).

Conclusion: Consistent with prior studies on screening mammogram, rates of screening breast MRI decreased during the COVID-19 pandemic. Unlike screening mammogram, supplemental breast MRI did not demonstrate a “rebound”_ to pre-COVID rates. Interventions to promote return to supplemental breast cancer screening may be needed for high-risk women across demographic and clinical groups. Future studies with larger, more diverse samples are needed to replicate and extend these preliminary findings.

Helicobacter Pylori Eradication Treatment Is Associated with a Lower Incidence of Colorectal Cancer, Based on a Nationwide Cohort Analysis

Shah SC, Camargo MC, Lamm M, Bustamante R, Roumie CL, Wilson O, Halvorson AE, Greevy R, Liu L, Gupta S, Demb J

Purpose: *Helicobacter pylori* (*H. pylori*), an established gastric carcinogen, is the most common cause of infection-associated cancer worldwide. Our primary objective was to evaluate the impact of *H. pylori* and *H. pylori* eradication treatment on colorectal cancer (CRC) incidence and mortality using the nationwide Veterans Health Administration cohort.

Methods: We conducted a retrospective cohort study among adults who completed *H. pylori* testing between 10/1/1999 to 12/31/2018. The index date was the date of first *H. pylori* testing. Individuals were followed until the earliest of: incident or fatal CRC, non-CRC death, or 12/31/2019. We used multivariable Cox models (adjusted for age at *H. pylori* testing, sex, race and ethnicity, BMI, smoking status, and aspirin use prior to the index date) to estimate incident and fatal CRC hazard ratios (HR) and corresponding 95% confidence intervals (95% CI) for CRC based on *H. pylori* status (positive vs negative) and eradication treatment status (treated vs untreated).

Results: Among 812,736 eligible individuals who completed *H. pylori* testing, 205,178 (25.2%) tested positive. Total follow-up time was 6,284,879 person-years. Compared to *H. pylori* negative individuals, *H. pylori* positive individuals had significantly higher 15-year CRC incidence (1.77% [95% CI 1.69%-1.85%] vs. 1.27% [95% CI 1.22%-1.32%]) and mortality (0.64% [95% CI 0.59%-0.69%] vs. 0.45% [95% CI 0.42%-0.48%]). Among *H. pylori* positive individuals, *H. pylori* treatment vs no treatment was associated with a significantly lower CRC incidence (1.44% [95% CI 1.34%-1.53%] vs. 1.82% [95% CI 1.68%-1.95%]) and mortality (0.57% [95% CI 0.51%-0.64%] vs. 0.78% [95% CI 0.68%-0.88%]) through 15 years follow-up. Individuals who were *H. pylori* positive had a significantly higher risk of incident (aHR, 1.18 [95% CI 1.12-1.24]) and fatal CRC (aHR 1.11 [95% CI 1.01-1.23]) compared to *H. pylori* negative individuals. Individuals with untreated vs treated *H. pylori* infection had a 23% (aHR, 1.23 [1.13-1.34]) and 37% (aHR 1.37 [1.17-1.61]) higher risk of incident and fatal CRC, respectively.

Conclusions: *H. pylori* positivity is associated with a significantly higher incidence of CRC and related mortality, and eradication treatment compared to no treatment lowers this risk.

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Red Flag Signs and Symptoms and Delays in Diagnosis for Early Onset Colorectal Cancer: A Systematic Review and Meta-Analysis

Demb J, Kolb JM, Dounel J, Advani S, Cao Y, Dwyer AJ, Fritz CDL, Holowatyj A, Lieu CH, Perea J, Song M, Spaander MCW, Vuik FER, Gupta S

Purpose: Timely diagnosis and treatment of early-onset colorectal cancer (diagnosed at ages <50 years; EOCRC) may improve stage at detection and outcomes, but the relative risk of potential signs and symptoms, and time to diagnosis are not well characterized. We conducted a systematic review and meta-analysis that quantified frequency, associated risk, and time to diagnosis among adults ages <50 with purported signs and symptoms of EOCRC.

Methods: A comprehensive literature search in Pubmed/MEDLINE, Embase, CINAHL and Web of Science through November 2021 was performed to identify studies conducted after 1996 and including individuals ages <50 with a diagnosis of non-hereditary colorectal cancer. We evaluated the proportion of presenting signs/symptoms pooled across studies using random-effects meta-analyses. We also assessed the association between signs/symptoms and EOCRC risk and time to diagnosis.

Results: Of the 11,727 unique articles retrieved, 620 full texts were reviewed, and 71 studies were included. Studies were performed in Africa (n=5), Asia/Middle East (n=24), Europe (n=18), North America (n=17), South America (n=5) and Oceania (n=2). Among adults diagnosed with EOCRC, the most common presenting symptoms reported were hematochezia (pooled proportion 45%, 95% CI 41-50%), abdominal pain (42%, 95% CI 38-46%), change in bowel habits (30%, 95% CI 25-35%) and weight loss (21%, 95% CI 18-23%). Hematochezia (relative effect estimate range: 9.8-54.0) and abdominal pain (relative effective estimate range: 4.5-6.0) were associated with increased relative EOCRC risk. The time from symptom onset to EOCRC diagnosis was reported as a mean 6.5 months (range: 1.8-13.7 months) by 18 studies and as a median 4.0 months (range: 2-6 months) by 10 studies.

Conclusions: Among individuals diagnosed with EOCRC, nearly half present with hematochezia and abdominal pain, symptoms associated with at least a 10-fold and 4-fold increased EOCRC risk, respectively. A delay in diagnosis of EOCRC for 4-6 months is common. These findings underscore an urgent need for clinicians to complete diagnostic work-up in patients under age 50 presenting with gastrointestinal symptoms in a timely manner, whether via symptom resolution or colonoscopy referral to identify or rule out CRC.

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Lessons Learned from Leveraging Cancer Epidemiology Cohort Data for AI/ML Applications

Lacey JV, Spielfogel ES, Savage KS, Anderson CA, Benbow JE, Clague-DeHart J, Duffy CN, Park HL, Thompson C, Wang SS, Martinez EM, Chandra S

Background: Many cancer epidemiology cohorts (CEC) have uniquely valuable real-world data on lifestyle, environment, and cancer risks and outcomes. Cohorts often use multivariate regression to evaluate associations between exposures and outcomes in hypothesis-driven research. Many cohorts also include large-scale data that could be used in artificial intelligence (AI) or machine learning (ML) projects. Subtle differences in data strategies for AI/ML vs. for cohort research could influence the outcomes of cohort-based AI/ML projects. We recently conducted two collaborative projects to evaluate how ready our cohort's data were for AI/ML applications.

Purpose: Our goals were to 1) use data from the California Teachers Study (CTS), a prospective CEC, to assess readiness for AI/ML modeling; and 2) identify and evaluate aspects of our CTS data strategy that should be improved to better facilitate AI/ML applications.

Methods: Since 1995, the CTS has collected survey data and linked hospitalization, cancer, and mortality data on N=133,477 adult female volunteers. Approximately 33,000 participants have died during follow-up, and 45% of those deaths occurred among participants who had been discharged from the hospital less than 30 days before their date of death. Using CTS data, we trained and tested predictive models to assess factors associated with deaths occurring less than one month after hospital discharge.

Results: Three key "data readiness" issues emerged from use of CTS data in these AI/ML projects. First, AI/ML requires larger and broader datasets than cohorts typically provide for hypothesis-driven projects. Second, missing-by-design data that are common in cohorts (e.g., skip patterns in surveys) can be a challenge for AI/ML. Third, scalable compute and storage is essential, even in cloud environments such as the CTS's.

Conclusions: Real-world data in cohort studies like the CTS can be leveraged for impactful AI/ML applications, but certain components of cohorts' data management strategies will need to be expanded in ways that optimize use of cohort data for AI/ML projects. We are currently implementing many of these changes to facilitate broader use of CTS data for future AI/ML applications.

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New Community Research Review System Tests Feasibility of Subsites to Boost Diverse Recruitment to Early Detection Trials

Howard TL, Farris PE, Blakesley SFE, Crist RL, Yunga ST, Potts DR, Nguyen PM, Ferrara LK, Michaels LC, Forrester KK, Shannon J

Purpose: Only 2% of the ten thousand NCI-supported clinical trials have sufficient diversity. Challenges to achieving diversity for Early Detection trials are different than for treatment trials. Typically, they are not offered in clinical settings, require enrollment of healthy individuals from the general public and in large numbers.

Method: Collaboration on two consecutive trials with the same sponsor served to test a new process to increase diversity in enrollment at OHSU Knight Cancer Institute's Early Detection Program (CEDAR). Both studies evaluated a multi-cancer early detection (MCED) test with a blood draw and return of results to participants. Trial1 was run entirely at OHSU and while we exceeded enrollment goals, our cohort was not diverse. Prior to Trial2, our team, in collaboration with longstanding community partners, used novel tools to assess feasibility of running subsites for enrollment. Deployed early in the trial planning phase, the Research in Oregon Communities Review (ROCR) system allows the community to determine Go/NoGo, identify obstacles, and gives opportunity for culturally appropriate adjustments to recruitment and implementation. Importantly, this bi-directional negotiation results in tangible investment from key collaborators.

Results: In Trial2 we are partnering with 4 remote health systems serving diverse communities. From ROCR we learned that local enthusiasm was great, but resources, personnel and experience with large trials were roadblocks. Through collaborative problem-solving with the community prior to trial initiation, we implemented tailored adaptations and gained community buy-in. These efforts have resulted in dramatic success: increasing our racial diversity 4-fold, ethnicity 15-fold, and doubling rural representation. As evidence of sustained relationship and trust building, new trials are launched and cancer prevention education is expanding in these subsite communities.

Conclusion: Engaging the community early and collaboratively comes with challenges; be prepared to overcome hurdles, spend extra time and money to achieve partnerships that will be sustainable into the future. Early Detection trials are not a passing fad and relying on established relationships will be critical to building representative cohorts.

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Nicotine as a Risk Factor for Substance Abuse in Cancer Patients

Cuomo RE, Mackey TK, Purushothaman VL

Background: Compared to cancer patients without tobacco/nicotine disorder (TND), those with TND may be at heightened risk for other conditions warranting intervention. Characterization of these comorbidities has not been assessed based on patient records.

Methods: Data were obtained from a database of electronic health records for patients from the University of California health system. The odds for every condition among cancer patients with TND were compared with those for cancer patients without TND. Stratified analysis was conducted for each of the twenty most common cancers observed. ORs were adjusted for gender, ethnicity, and race.

Results: 3,791 cancer patients with TND had 252,619 total conditions, and 51,711 cancer patients without TND had 2,310,880 conditions. After adjusting for confounders, the condition for which TND most exacerbated risk was psychoactive substance-induced organic anxiety disorder (OR=16.3, $p<0.001$). This appeared consistent with the second, third, and fifth most-exacerbated conditions: stimulant abuse (OR=12.8, $p<0.001$), cocaine induced mental disorder (OR=11.0, $p<0.001$), and cocaine abuse (OR=11.0, $p<0.001$). Different conditions exacerbated by TND include acute alcoholic intoxication (OR=11.4, $p<0.001$), opioid abuse (OR=7.6, $p<0.001$), schizoaffective disorder (OR=7.4, $p<0.001$), and cannabis abuse (OR=6.3, $p<0.001$). TND increased risk for psychoactive substance-induced organic anxiety disorder specifically among patients with colorectal cancer (OR=3.1, $p=0.032$) and patients experiencing neoplasm-related pain (OR=3.4, $p=0.019$) in adjusted models.

Conclusions: Cancer patients with nicotine dependence are at heightened risk for substance abuse and related mental health conditions. An update of clinical guidelines for screening and other interventional services for cancer patients presenting with nicotine dependence should be considered.

107-T

Time-Specific Impact of Trace Metals on Breast Composition of Adolescent Girls in Santiago, Chile

Kim CE, Pereira A, Binder AM, Amarasiriwardena C, Shepherd J, Corvalan C, Michels KB

Purpose: To prospectively evaluate the association between trace metals at specific pubertal time points on adolescent breast density, an early life risk factor for breast cancer.

Method: This study included Chilean girls from the Growth and Obesity Cohort Study with urine sample collection at Tanner breast stage B1 (n=291) and at stages both B1 and B4 (n=253) and breast density measurements at 2 years post menarche. Dual-energy X-ray absorptiometry was used to assess the volume of dense breast tissue (absolute fibroglandular volume (FGV)) and percent breast density (%FGV). Urine trace metals analyzed included arsenic, barium, cadmium, cobalt, cesium, copper, magnesium, manganese, molybdenum, nickel, lead, antimony, selenium, tin, thallium, vanadium, and zinc. Parametric G-formula was used to estimate the time-specific association between trace metals and breast density. The analyses accounted for the covariates age, body fat percentage, birthweight, age of menarche, maternal education, and creatinine.

Results: At B1, a doubling of thallium concentration resulted in 13.69 cm³ increase in absolute FGV (95% confidence interval (CI): 2.81, 24.52), while a doubling of lead concentration was associated with a 7.76 cm³ decrease in absolute FGV (95%CI: -14.71, -0.73). At B4, a doubling of barium concentration was associated with a 10.06 cm³ increase (95% CI: 1.44, 18.60), copper concentration with a 12.29 cm³ increase (95% CI: 2.78, 21.56) lead concentration with a 9.86 cm³ increase (95% CI: 0.73, 18.98), antimony concentration with a 12.97 cm³ increase (95% CI: 1.98, 23.79) and vanadium concentration resulted in a 13.14 cm³ increase in absolute FGV (95% CI: 2.73, 23.58).

Conclusions: Our evaluation of environmental exposures in relation to breast density provides insights into the potential biological mechanisms of carcinogenesis in the breast during the critical period of puberty. In this cohort of Latino girls, selected trace metals - barium, copper, lead, antimony, thallium, and vanadium – were associated with absolute breast density. We also observed an association between copper and percent FGV.

Lifestyles Behavior, Energy Balance & Chemoprevention

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Analyzing Body Fat in Participants from Project TONE: An Exercise and Diet Intervention to Improve Body Composition in Postmenopausal Women with Normal BMI but Higher Body Fat

Gao AX, Baum ML, Fares S, Coletta AM, Parker N, Dannenberg AJ, Basen-Engquist KM

Purpose: To compare body fat levels in postmenopausal women with normal BMI from Project TONE (NCT04267796), a diet and exercise trial, and the Women's Health Initiative (WHI), in order to explore whether body fat distributions have changed since the 1990s.

Methods: Postmenopausal women aged 50-69 with normal BMI were recruited from the employee pool at MD Anderson Cancer Center for a trial of a diet and exercise intervention called Project TONE. As part of screening for Project TONE, we assess body fat levels with a whole body DXA scan. We calculated the quartiles of trunk fat mass and means and confidence intervals for age and BMI of the women screened for the trial. These values were compared with data on body fat in 3,460 postmenopausal WHI participants with normal BMI who were aged 50-79 years from 1993-1998 (Iyengar et al., 2018).

Results: Thus far, 35 women have been screened with a DXA scan. For these women, we found that the 25th (8.5 kg) and 50th (10.1 kg) percentiles of trunk fat mass were higher than the 25th (7.4 kg) and 50th (9.4 kg) percentiles in the WHI participants. Additionally, the mean BMI (23.1 [95% CI, 22.4-23.8]) was higher in those screened for Project TONE than in the WHI data (M=22.6). Age was a potential confounder, as those screened for Project TONE were younger (M=57.5 years [95% CI, 55.9-59]) compared with the mean age (63.6 years) from WHI data.

Conclusions: The observed higher central adiposity in women screened for Project TONE suggests that body fat levels among postmenopausal women with normal BMI may be higher now (2020s) than before (1990s). Given Iyengar et al.'s finding that postmenopausal women with normal BMI in the highest quartile of trunk fat mass were almost twice as likely to develop breast cancer, lifestyle strategies are needed to promote favorable body composition phenotypes (e.g., lower body fat, adequate muscle mass). Project TONE is underway to determine if exercise and diet changes can improve body composition and reduce biomarkers of breast cancer risk in postmenopausal women with normal BMI.

109-T

Associations between Perceived Barriers, Social Support, and Self-efficacy with Diet Quality and Physical Activity among Cancer Survivors and their Supportive Partners

Kaur H, Pekmezi DW, Pavea G, Demark-Wahnefried W

Purpose: To improve lifestyle behaviors among cancer survivors and their partners, this study examined associations between perceived barriers, social support, and self-efficacy with diet quality and moderate-to-vigorous physical activity (MVPA) within this population.

Methods: This secondary analysis was performed on baseline data from 112 cancer survivors and their supportive partners (56 dyads) enrolled in the 6-month DUET web-based lifestyle intervention trial. Participants completed online surveys that addressed 31 common barriers to diet and physical activity, social support (8-item instruments by Sallis et al), self-efficacy (20-item instrument for diet by Clark et al. and the 8-item Lifestyle Efficacy scale for physical activity by McAuley et al), and physical activity using the Godin Leisure-Time Exercise Questionnaire. Diet quality (Healthy Eating Index [HEI]-2015) was assessed using 2-day, ASA-24 assisted, dietary recalls. Spearman partial correlation analyses were performed to detect associations between inter/intrapersonal factors with diet quality and MVPA.

Results: The study sample was largely female (86%) and non-Hispanic White (69%) with a mean age of 58 years. The average HEI was 53.1 (SD 11.7 (range 29.2–87.8), and MVPA was 43.8 (SD 59.5 minutes/week (range 0–280). Physical activity barriers were inversely associated with MVPA ($r = -0.53$, $p\text{-value} = <.0001$), whereas social support and self-efficacy were positively associated with MVPA, $r = 0.26$, $p\text{-value} = .0073$ and $r = 0.30$, $p\text{-value} = .0015$, respectively. No significant associations were detected between diet quality and dietary barriers, social support, and self-efficacy. However, dietary barriers were significantly higher in cancer survivors compared to partners (24.1 vs. 16.4, $p\text{-value} = 0.0452$).

Conclusions: These data emphasize the need to incorporate strategies within lifestyle interventions that enhance social support and self-efficacy and reduce barriers to physical activity to promote behavior change. Barriers to improving diet are a key consideration in interventions for cancer survivors. Given that these data are limited by their cross-sectional nature, future studies are needed to ascertain the potential mediating impact of these factors on behavior change.

110-T

Associations of Fat Mass and Sarcopenia with All-Cause and Cancer-Specific Mortality in Cancer Survivors

Aduse-Poku L, Karanth SD, Wheeler M, Yang D, Washington C, Fabregas J, Cheng TY, Braithwaite D

Purpose: The role of body composition in cancer outcomes is of great clinical interest. We investigated whether the risks of all-cause and cancer-specific mortality differ by levels of total fat mass and sarcopenia status in cancer survivors.

Methods: Participants included 1682 adult cancer survivors who had undergone dual-energy x-ray absorptiometry (DXA) examination to measure body composition, gathered from the 1999-2006 and 2011-2018 National Health and Nutrition Examination Survey (NHANES). Total fat mass was categorized into tertiles (we assessed high vs. low tertiles), and sarcopenia was defined by appendicular skeletal muscle mass index (females $< 5.45\text{kg/m}^2$ and males $< 7.26\text{kg/m}^2$). Multivariable Cox proportional hazards models were performed to estimate adjusted hazard ratio (aHR) and 95% confidence interval (CI); we also stratified by race. In addition, we performed a restricted cubic spline analysis to assess the potential non-linear association between fat mass and all-cause mortality.

Results: The mean age of study participants was 61.9 years, and they were followed up for an average of 9.67 years. Overall, sarcopenia was present in 304 (25.0%), and 561 (33.4%) of the participants had high total fat mass. Participants with higher fat mass had 30% increased risk of all-cause mortality (aHR=1.30, 95% CI=1.06-1.61) compared to participants with low fat mass, while participants with sarcopenia had a 51% higher risk (aHR=1.51, 95% CI=1.22-1.88) than participants with no sarcopenia. A restricted cubic spline analysis revealed a J-shaped association between fat mass and all-cause mortality. Further, sarcopenia was also associated with a higher risk of cancer-specific mortality (aHR=1.74, 95% CI=1.23-2.29) compared to non-sarcopenia. The association between sarcopenia and all-cause mortality was twice as strong in Non-Hispanic Blacks (aHR=2.99, 95% CI=1.39-6.06) compared to Non-Hispanic Whites (aHR=1.53, 95% CI=1.19-1.95).

Conclusion: Our findings show opposing relations of fat mass and appendicular skeletal muscle mass index with mortality in a national sample of cancer survivors, and the relationships may differ by race. These results emphasize the importance of maintaining a healthy body composition among cancer survivors.

111-T

Associations of Muscle and Lean Mass with Relative Dose Intensity and Adverse Events among Patients with Nonmetastatic Colon Cancer: Findings of CT, DXA, and D3-Creatine Dilution

Cheng E, Caan BJ, Cawthon PM, Evans WJ, Hellerstein MK, Shankaran M, Campbell KL, Binder AM, Lee C, Sternfeld B, Meyerhardt JA, Schmitz KH, Cespedes Feliciano EM

Purpose: The impact of muscle and lean mass on relative dose intensity (RDI) and adverse events is not well understood for colon cancer patients, and assessing muscle and lean mass with multiple techniques may provide insight.

Methods: Using an NCI-sponsored trial of resistance training (FORCE), we assessed 1) cross-sectional area (CSA) of skeletal muscle at L3 from computed tomography (CT); 2) appendicular lean mass (ALM) from dual-energy X-ray absorptiometry (DXA); and 3) total body skeletal muscle mass using D3-creatine (D3Cr) dilution among 178 patients with nonmetastatic colon cancer. Not every patient undertook all three techniques at the baseline visit, but clinicopathological factors of patients with CT (N=170), DXA (N=162), and D3Cr (N=118) groups were comparable. We standardized each measurement by its sex-specific standard deviation (SD). The primary outcome was reduced RDI (RDI <85%). The secondary outcome was the number of moderate/severe adverse events (grade ≥2) during each cycle of chemotherapy. We estimated the associations of CT CSA, DXA ALM, and D3Cr muscle mass (per SD increase) with reduced RDI using logistic regression, and number of adverse events using generalized estimating equations for repeated measures based on regimen duration. All models were adjusted for age, sex, height, regimen, and randomization arms.

Results: Of 178 patients, the mean (SD) age was 55.2 (12.9) years, and 94 (52.8%) were male. Ninety-three (52.2%) experienced reduced RDI, and the mean (SD) number of adverse events was 1.4 (1.7) per cycle. Increased CT CSA and DXA ALM were significantly associated with lower risk of reduced RDI (odds ratios [OR]: 0.59 [95% CI: 0.41, 0.85] for CT CSA and 0.57 [95% CI: 0.38, 0.84] for DXA ALM). The inverse association was also observed for D3Cr muscle mass (OR: 0.77 [95% CI: 0.48, 1.25]) but was not significant. Increased muscle and lean mass were not significantly associated with the changes in the number of adverse events (relative change: 9% [95% CI: -8%, 30%] for CT CSA; 9% [95% CI: -6%, 27%] for DXA ALM; -1% [95% CI: -17%, 20%] for D3Cr muscle mass).

Conclusions: In this study of patients with nonmetastatic colon cancer, higher muscle and lean mass were associated with improved chemotherapy completion but not adverse events.

112-T

Cocaine Use and Risk of Head and Neck Cancer: A Pooled Analysis in the International Head and Neck Cancer Epidemiology (INHANCE) Consortium

Zhang M, Zhang ZF, INHANCE Consortium Pls

Purpose: Cocaine is used globally as a recreational drug; however, little information was available on whether cocaine use alters risk of head and neck cancer (HNC). We conducted this pooled analysis to evaluate the association between cocaine use and HNC.

Methods: A pooled analysis was conducted comprising individual-level data from 3 case-control studies in the INHANCE consortium. Self-reported information on cocaine use (smoking and other administrations through the airway), socio-demographic, and behavioral factors was obtained from 1641 HNC cases and 2506 controls. Odds ratios (ORs) and 95% confidence intervals (95% CIs) were estimated using random-effects logistic regression models.

Results: After adjusting for potential confounders, ever life-time cocaine use was associated with HNC (OR = 1.35, 95% CI: 0.96, 1.90). In the stratified analyses, while we did not detect associations among non-tobacco users or non-drinkers, the positive association was still observed among tobacco users (OR = 1.42, 95% CI: 0.98, 2.06) and alcohol drinkers (OR = 1.34, 95% CI: 0.93, 1.92).

Conclusions: We observed a weak to moderate positive association between cocaine use and HNC risk within the INHANCE consortium. Although we tried to take advantage of the large sample size of the consortium, we were unable to verify the association among non-tobacco users or non-drinkers due to sample size. The observed associations should be explored in future studies.

113-T

Correlates of Changes in Women's Alcohol Consumption during the COVID-19 Pandemic

Lewicka M, Hamilton J, Schofield E, Carlsson S, Kiviniemi M, Orom H, Ray A, Waters EA, Allard N, and Hay JL

Background: Alcohol is a major risk for many cancers. Alcohol use among women is reported to have been exacerbated by the COVID-19 pandemic. To identify factors surrounding pandemic-related increases in women's drinking, we examined demographics, drinking motives, and patterns of alcohol use in relation to changes in alcohol consumption during COVID-19.

Methods: In July 2022, we surveyed 300 respondents aged 18+ with no cancer history, of whom 201 were women, from NIH-supported ResearchMatch, a national health volunteer registry. We used multinomial logistic regression to examine how changes in alcohol consumption in women during the pandemic (decreased, stayed the same, or increased; stayed the same served as the referent) were associated with demographics, drinking motives (enhancement, social, conformity, and coping), and patterns of use (past month, on one occasion, drinking days). All measures were validated.

Results: Most women (57%) reported alcohol use in the past month. Women who reported past month use consumed about two ($M=1.88$ [$SD=1.41$]) drinks on the days they drank; 25% of them reported binge drinking (i.e., >3 drinks on an occasion). Among drinkers, 34% reported that their consumption increased during the pandemic and 16% reported that it decreased. Binge drinking in the past month was reported by 28% of those whose consumption decreased, 24% of those whose consumption stayed the same, and 41% of women whose consumption increased. Compared to women whose alcohol consumption stayed the same during the pandemic, women who increased drinking were younger, had more drinks on any occasion, and drank for enhancement reasons (e.g., "It's fun;"_ all $ps<.05$). In contrast, those who decreased consumption had lower income (<\$50,000), and drank for social reasons (e.g., "To help enjoy a party;"_ $ps<.05$). There were no associations between education, coping and conformity motives, and changes in consumption ($p>.05$).

Conclusion: Binge drinking was most common in women whose drinking increased during the pandemic. Younger age, drinking more on any occasion, and enhancement motives emerged as risk factors for increased drinking, and important cancer reduction intervention targets in women whose alcohol consumption rose during the COVID-19 pandemic.

114

Development of a Novel Community Connectedness Classification and Association with Modifiable Cancer Risk Factors in Southern Arizona: A Spatial Analysis

Skiba MB, Lind K, Krupnik C, Felion C, Segrin C

Purpose: Develop and validate community connectedness classification (C3) to represent positive factors representing social determinants of health (SDOH) and evaluate the relationship between C3 and modifiable population level cancer risk factors in Southern Arizona (SAZ).

Methods: Publicly available 2020 Census and 2018 Behavioral Risk Factor Surveillance System (BRFSS) data were normalized and merged by zip code. To represent

positive SDOH factors, C3 was developed using principal components analysis and evaluated for reliability and validity. Spatial autoregressive (SAR) modeling with generalized spatial two-stage least-squares estimation was used to quantify the direct effects of C3 and modifiable cancer risk factors in SAZ (obesity, low fruit and vegetable intake, physical inactivity, smoking, and alcohol use) adjusting for demographics, technology access, and urban/rural designation. Geographic information systems (GIS) analysis using geographically weighted regressions with density modeling visualized relationships.

Results: C3 demonstrated good reliability and validity. Items with high factor loadings included greater population percent that: 1) have higher household income, 2) are above the federal poverty line, 3) are considered food secure, 4) have internet access, 5) attained higher education, and 6) have a primary care provider. Values were classified into deciles for final C3 scores. A C3 score of 10 indicates communities with greater prosperity (high) while a 1 indicates communities with greater privation (low). SAR models indicated that C3 was significantly inversely associated with SAZ population level obesity ($\beta=-0.20$; 95%CI: -0.35, -0.06), low fruit and vegetable intake ($\beta=-0.35$; 95%CI: -0.51, -0.19), physical inactivity ($\beta=-0.32$; 95%CI: -0.48, -0.16), and smoking ($\beta=-0.34$; 95%CI: -0.62, -0.07). GIS revealed patterns of C3 clustering and modifiable cancer risk factors by zip code.

Conclusions: C3 is directly inversely associated with population level modifiable cancer risk factors. Spatial analysis is a valuable tool for researchers in other US regions to inform policy, healthcare delivery, and intervention design to improve cancer outcomes locally.

115-T

Dietary and Physical Activity Changes in Young Men Following a Self-Guided Lifestyle Intervention: The ACTIVATE Pilot Randomized Controlled Trial

Reading JM, Crane MM, Evans RK, Guan J, Meyer M, Brown KL, LaRose JG

Purpose: We recently showed a self-guided lifestyle intervention (ACTIVATE), integrating male-targeted health risk messaging, can produce modest weight loss among young men. The study objective was to examine whether improvements in diet quality and physical activity were observed.

Methods: Participants were 35 young men 18-35 years ($Age=29.3$, 4.27; $BMI=30.8$, 4.26). Men were randomly assigned to either a 12-week ACTIVATE self-guided intervention arm or a delayed treatment control arm. The intervention included 1 virtual group kick-off session, digital tools (wireless scale, self-monitoring app), access to self-

paced content (diet, physical activity, behavioral strategies) via a secure website, and 12 weekly texts to reinforce health risk messaging. Assessments occurred at 0 and 12 weeks. Outcomes of interest included cups of fruit and vegetable (f/v) consumption (NCI Dietary Screening Questionnaire) and weekly minutes of physical activity (Global Physical Activity Questionnaire). Independent t-tests were used to compare group differences on outcome variables (significance level=.05).

Results: Men in the ACTIVATE intervention had higher increase in f/v intake compared to the control (+1.5 [SD=2.5] vs. -0.72 [SD=1.9]; $p=.012$). Men in the intervention reduced weekly sedentary minutes by -57.9 (SD=110.7) compared to the control arm -9.4 ([SD=121.8]; $p=.266$, Cohen's $d=.42$). No significant group differences were observed for change in moderate-to-vigorous activity (-5.4 [SD=139.7] vs. -6.4 [SD=193.8]; $p=.407$, Cohen's $d=.005$), vigorous activity (+7.7 [SD=126.5] vs. +9.5 [SD=82.6]; $p=.685$, Cohen's $d=.017$), or total activity (+27.1 [SD=199.6] vs. +32.8 [SD=210.6]; $p=.913$, Cohen's $d=.027$).

Conclusions: A primarily self-guided lifestyle intervention increased self-reported f/v consumption, but improvements in physical activity were modest. A self-guided lifestyle intervention could be a low-cost and scalable approach, but more testing is needed to further understand ways to enhance physical activity among young men.

116-T

Facilitators of Nutrition and Exercise Interventions among Individuals with a History of Breast Cancer Under the COVID-19 Era

Chen X, Chiu C, Cheung HT, Chen X, Trinh L, Arthur AE

Purpose: Nutrition and exercise are vital components of breast cancer (BC) care. This study aimed to investigate the facilitators associated with participating in nutrition and exercise intervention programming among people with a history of BC.

Methods: A cross-sectional survey was administered to participants who were 18 years or older and diagnosed with ductal carcinoma in situ (DCIS) or Stage I-IV BC from 2019 to 2021. Participants were recruited during routine oncology appointments at a Midwestern cancer center. Qualitative data from an open-ended question querying facilitators to participating in a combined exercise and nutrition intervention program was extracted and summarized. A total of 224 participants participated in our study. 130 participants completed the survey prior to the COVID-19 pandemic and 94 participants completed it after the start of the pandemic (March 2020 or later). As such, subset descriptive analysis to compare pre-COVID to post-COVID responses was performed.

Results: Seventy percent of participants responded to the open-ended question regarding facilitators (pre-COVID: 84/130; post-COVID: 72/94). Awareness, timing of being notified, convenience (e.g., location, time of day), customization, program design, peer support, and an encouraging environment were the most stated facilitators. There was a significant increase in a desire for program customization/personalization as a facilitator from pre- to post-COVID ($p<.01$). Although not statistically significant, offering peer support and creating an encouraging environment doubled as reported facilitators from pre- to post-COVID. A framework that grouped and summarized the reported facilitators was developed to help visualize program facilitating strategies.

Conclusion: Various facilitators related to participation in nutrition and exercise interventions were reported by a sample of individuals with a BC history, which may guide the development of future nutrition and exercise interventions during the COVID-19 era. Future research and intervention planning should incorporate strategies inspired by the reported facilitators, as relevant to basic operations, recruitment, design, participant-centered information, delivery and retention of nutrition and exercise programming.

117-T

Firefighter Health Behaviors Linked to Cancer: A Latent Class Analysis Approach

Glasgow TE, Burch JB, Arcan C, Fuemmeler BF

Purpose: Given the lack research examining health behaviors linked to cancer among firefighters, the purpose of this pilot study was to use latent class analysis (LCA) to better understand firefighter health profiles,

Methods: Firefighters in a medium-sized city were contacted to complete a survey ($n=171$). Participants were asked basic demographic questions and engagement in six health behaviors: physical activity (at least 150 minutes of moderate intensity physical activity per week), fruit and vegetable consumption (at least 5 fruits and vegetables per day), alcohol (drink once a week or less), cigarette use (have not smoked at least 100 cigarettes in lifetime), sleep quality (at least fairly good sleep quality), and sleep quantity (at least 7 hours per night). Firefighters answered questions about their cancer beliefs, social support, and perceived stress.

Results: Using Mplus, LCA was conducted to determine the number of health profiles. The best fitting model was a 2-class model. In Class 1 (24.3% of firefighters), almost all firefighters reported good sleep quality and adequate sleep quantity, compared to Class 2 (75.7% of firefighters), where half of firefighters reported good sleep quality, but none reported adequate sleep quantity. Firefighters in Class 2

were more physically active than those in Class 1. The classes did not differ in other health behaviors. A logistic regression model was conducted to assess variables associated with class membership. Compared to White firefighters, Black/African American or other race firefighters were more likely to be in Class 2 (OR = 2.62, $p = .041$). Compared to non-college educated firefighters, college educated firefighters were less likely to be in Class 2 (OR = 0.45, $p = .051$). Compared to firefighters who had less fire service experience, those with more experience were less likely to be in Class 2 (OR = 0.95, $p = .020$). Social support, cancer beliefs, and perceived stress were not associated with class membership.

Conclusions: We took a person-centered approach to better understand firefighter health profiles, with two subgroups emerging. Several demographic variables were associated with the health profiles. The findings provide implications for future firefighter health behavior interventions.

118-T

Measuring Physical Activity in Breast Cancer Survivors: Comparison of Actigraph, Fitbit, and International Physical Activity Questionnaire Data

Huang Y, Donzella S, Rillamas-Sun E, Sanchez SC, Guthrie KA, Di C, Greenlee H

Purpose: To evaluate agreement of physical activity (PA) measures from Actigraph GT3Xs, the International Physical Activity Questionnaire (IPAQ), and Fitbits in breast cancer survivors (BCS).

Methods: Cook and Move for Your Life was a feasibility study testing a 6-month nutrition and PA behavioral intervention in female BCS. In the study, PA was collected using 3 methods: 1) wearing an Actigraph GT3X accelerometer for 7 days; 2) self-reporting PA over the previous 7 days (IPAQ); and 3) using a Fitbit Inspire HR to self-monitor PA. Actigraph and IPAQ data were collected at baseline and 6 months, while Fitbit data were collected following randomization to 6 months. Measures of light, moderate-to-vigorous (MVPA), and total PA were estimated for each method: validated cut-points from non-sleeping wear time for Actigraph, a standardized scoring procedure for IPAQ, and an undisclosed proprietary algorithm for Fitbit. MVPA of 150 min/week indicated meeting PA guidelines. Correlations of PA levels and agreement on meeting the MVPA target were estimated using Pearson correlation coefficients and kappa statistics, respectively.

Results: Seventy-three BCS provided baseline data for the analysis; 48 also provided 6-month data. Baseline mean MVPA in min/week was 158 for Actigraph and 298 for IPAQ. Similarly, 6-month mean MVPA from the Actigraph, IPAQ, and Fitbit was 179, 279, and 382 min/week, respectively. At baseline and 6 months, Actigraph and IPAQ had very

weak correlation for all PA measures ($|r| < 0.12$). At 6 months, correlation between Fitbit and Actigraph was weak for MVPA ($r = 0.23$) and strong for light ($r = 0.67$) and total PA ($r = 0.65$), but correlation between Fitbit and IPAQ was weak to very weak for all PA measures ($|r| < 0.38$). The proportion of participants meeting the MVPA target at 6 months measured by Actigraph, Fitbit, and IPAQ was 50%, 79%, and 63%, respectively, which translated to moderate agreement between Actigraph and Fitbit ($\kappa = 0.6$), and slight agreement between Actigraph and IPAQ ($\kappa = 0.1$).

Conclusion: Agreement of subjective and objective PA measures ranged from poor to moderate, highlighting the potential variability among these measures in BCS. Future studies of PA in BCS must balance potential measurement biases with cost and ease of data collection.

119-T

Post-Diagnostic Alcohol Consumption and Risk of Prostate Cancer Progression

Srivastava T, Chan JM, Kenfield S, Langlais C, Cowan J, Liu V, Broering JM, Carroll PR, Van Blarigan E

Purpose: The association between post-diagnostic alcohol consumption and the risk of prostate cancer progression remains unclear. We prospectively examined this association in a large cohort of men with prostate cancer.

Methods: Men diagnosed with prostate cancer actively participating in the Cancer of the Prostate Strategic Urologic Research Endeavor (CaPSURE) cohort study were invited to complete a validated Food Frequency Questionnaire (FFQ) (up to twice between 2003-2005 and once between 2015-2017). 1895 patients completed the FFQ with valid calories at least once prior to cancer progression. Only 443 completed more than one survey, so we used data from each patient's first available FFQ only for this study. Our primary exposures were total alcohol (g/d) and types of alcohol (red and white wine, beer, liquor; drinks/day). The primary outcome was a composite outcome that included biochemical recurrence, need for secondary treatment, bone metastases, or death attributed to prostate cancer assessed through urologist report with medical record and death certificate confirmation. We used multivariable Cox proportional hazards regression models to calculate hazard ratios (HR) and 95% confidence intervals (CI) for the associations between alcohol intake and the risk of prostate cancer progression, adjusting for time from diagnosis to the survey, study site, Gleason score, diagnostic PSA, age, primary treatment, daily calories and walking pace.

Results: Among 1,795 men (162 events, median 6.69y follow-up), we found no statistically significant association between total alcohol and risk of prostate cancer progression. However, red wine consumption was found to

be associated with lower risk of prostate cancer progression, with an adjusted HR of 0.34 (95%CI 0.18, 0.67; p=0.02) for prostate cancer progression among patients drinking ≥ 5 vs. 0 glasses/week of red wine (p-trend=0.0007). No other type of alcohol was found to be associated with the risk of prostate cancer progression.

Conclusion: While we found no evidence for an association between post-diagnostic consumption of alcohol in general and risk of prostate cancer progression, consumption of at least 5 glasses of red wine per week may be associated with lower risk of prostate cancer progression.

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Post-diagnostic Health Behavior Scores and the Risk of Prostate Cancer Progression and Mortality

Langlais CS, Graff RE, Van Blarigan EL, Neuhaus JM, Cowan JE, Broering JM, Carroll PR, Kenfield SA, Chan JM

Purpose: Individual health behaviors are associated with prostate cancer progression. Behavioral scores, comprised of multiple risk factors, allow assessment of the combined impact of multiple behaviors.

Methods: We examined the association between six health behavior scores and the risk of prostate cancer progression and death, in a cohort of 2,156 men with prostate cancer: two scores developed based on the prostate cancer survivorship literature ('2021 Score [+ Diet]'); a score developed based on pre-diagnostic prostate cancer literature ('2015 Score'); and three scores based on recommendations for cancer prevention (World Cancer Research Fund/American Institute for Cancer Research 'WCRF/AICR Score') and survival (American Cancer Society 'ACS Score [+ Alcohol]'). Hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated for prostate cancer progression and prostate cancer death, using parametric survival models (interval censoring) and Cox models, respectively. Multivariable models were adjusted for diagnostic age, stage, grade, and prostate specific antigen level, treatment, time between diagnosis and survey, family history of prostate cancer, race, total caloric intake, and the following items (if not in the score) – whole milk, wine, total alcohol, red and processed meat, and dark meat fish intake, selenium supplement use, and smoking history.

Results: Over a median (IQR) of 6.4 (1.3, 13.7) years, we observed 192 progression and 73 prostate cancer mortality events. Higher (i.e., healthier) 2021 Score + Diet and WCRF/AICR Score were inversely associated with risk of prostate cancer progression (2021 + Diet: HRcontinuous=0.76, 95% CI: 0.63-0.90; WCRF/AICR: HRcontinuous=0.83, 95% CI: 0.67-1.02) and mortality (2021 + Diet: HRcontinuous=0.65, 95% CI: 0.45-0.93; WCRF/AICR: HRcontinuous=0.71; 95% CI: 0.57-0.89). The ACS Score + Alcohol was only associated

with progression (HRcontinuous=0.89, 95% CI: 0.81-0.98), while the 2021 Score was only associated with prostate cancer mortality (HRcontinuous=0.62, 95% CI: 0.45-0.85). The 2015 Score was not associated with prostate cancer progression or mortality.

Conclusion: Findings strengthen the evidence that behavioral modifications following a prostate cancer diagnosis may improve clinical outcomes.

121-T

Predictors of Adherence to Healthy Lifestyle Behaviors Among Women Receiving Chemotherapy for Breast Cancer: Lifestyle, Exercise and Nutrition Early After Diagnosis (LEANer)

Puklin LS, Li F, Ferrucci LM, Cartmel B, Ligibel J, Harrigan M, McGowan C, Zupa M, Spiegelman D, Sharifi M, Sanft T, Irwin ML**

Purpose: Breast cancer survivorship recommendations include maintaining a healthy body weight, eating a high quality diet and meeting general physical activity guidelines. Less research has focused on adopting and adhering to these lifestyle behaviors during breast cancer treatment. We explored predictors associated with adherence to diet and physical activity recommendations in women with breast cancer undergoing chemotherapy enrolled in the Lifestyle, Exercise and Nutrition Early after Diagnosis (LEANer) trial.

Methods: 173 women with stage I-III breast cancer undergoing chemotherapy were randomized to a 1-year, 16-session, nutrition and exercise intervention (n=87) or usual care (n=86). Our main outcomes were 1) minutes per week of moderate-to-vigorous exercise, collected via interview-administered physical activity questionnaires (PAQ) and 2) diet quality, using the Healthy Eating Index-2015 (HEI) from food frequency questionnaire (FFQ) data. We used t-tests to examine mean differences in exercise and diet quality at 1-year by sociodemographic characteristics, clinical and baseline patient-reported outcomes. All univariate associations significant at p<0.1 were included in multivariable regression models.

Results: Among the 87 women randomized to intervention, 72 (83%) completed the FFQ and 80 (92%) completed the PAQ at 1-year. At baseline, women reported an average of 27.0 (Standard Deviation (SD)=42.0) min/week of exercise (1.2% met ≥ 150 min/week goal) and a mean HEI score of 67.0 (SD=9.8). At 1-year, women reported 221.5 (SD=166.6) min/week of exercise (56.3% met ≥ 150 min/week goal) and HEI score of 72.2 (SD=9.3). In the multivariable model, at 1-year post-randomization, being married or living with a partner significantly predicted more minutes per week of exercise (p=0.04). In the multivariable model for HEI, higher

education level ($p=0.01$) and higher HEI score at baseline ($p=0.02$) were associated with higher HEI score at 1-year.

Conclusion: These results demonstrate that women can initiate and maintain healthy exercise and eating patterns while undergoing active treatment for breast cancer. Future research should explore whether social determinants of health influence lifestyle behavior change during chemotherapy to help inform future interventions.

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Predictors of Physical Activity and Exercise among Participants in a Randomized Trial of Home-Based Prehabilitation during Preoperative Pancreatic Cancer Treatment

Parker NH, Ngo-Huang A, Schadler K, Petzel MQB, Prakash L, Cotto AM, Tzeng CWD, Ikoma N, Basen-Engquist KM, Katz MHG

Purpose: Exercise prehabilitation (“prehab”) can improve fitness, physical functioning (PF), and health related quality of life (HRQoL) prior to cancer resection. We sought to evaluate predictors of exercise and physical activity (PA) among participants in a randomized trial of home-based prehab for pancreatic cancer (PC).

Methods: Patients presenting with localized PC were randomized to enhanced usual care (UC+) or home-based exercise prehab (EP). UC+ participants received a Fitbit and encouragement to be physically active. EP participants received a Fitbit, resistance tube sets, and instruction to engage in moderate-intensity aerobic exercise (≥ 30 minutes on 5 days/week) and progressive, full-body resistance training (RT, 2x/week). EP participants received biweekly phone calls to encourage adherence. Participants completed questionnaires at baseline/enrollment (T0) assessing exercise (modified Godin Questionnaire), PF (PROMIS12a), HRQoL (FACT-Hep), exercise motivation (BREQ-3), and exercise barrier self-efficacy (BSE). PA and exercise during the study period were assessed using Fitbits (daily steps, weekly active minutes) and repeat modified Godin questionnaires at pre-surgical clinical restaging (T1).

Results: 151 participants were randomized to UC+ ($n=76$, age mean ffl SD 66.2 ffl 8.2 years, 33% female) and EP ($n=75$, age 66.1 ffl 8.5 years, 26% female). There were no significant clinicodemographic differences between groups and no significant differences in self-reported exercise or Fitbit steps or active minutes at T1. With UC+ and EP combined in pooled analyses, females showed fewer daily steps and fewer weekly active minutes than males ($p=.02$ and $p<.001$, respectively). T0 self-reported aerobic exercise, PF, HRQoL, exercise motivation, and BSE were all positively correlated with exercise and/or PA variables at T1 (all $p<.05$).

Conclusions: Randomization to a more formal home-based exercise program did not lead to more exercise or PA among patients preparing for PC resection compared to general PA recommendations and Fitbit provision. Correlations among T1 exercise and PA and T1 functional status (PA, PF, HRQoL) and exercise readiness (motivation, BSE) suggest that these may warrant additional considerations for intervention tailoring and support.

123-T

Relationship Between a Traditional Mexican Diet and Hepatic Steatosis and Fibrosis Among Mexican-Origin Hispanic Adults at Risk for Hepatocellular Carcinoma

Lopez-Pentecost M, Tamez M, Mattei J, Jacobs ET, Thomson CA and Garcia DO

Background: Hispanics of Mexican-origin (MO) have disproportionate rates of non-alcoholic fatty liver disease (NAFLD), a disease influenced by dietary factors that also drive risk of hepatocellular carcinoma.

Objective: To investigate the relationship between adherence to the traditional Mexican diet (TMexS) and NAFLD-related clinical endpoints (hepatic steatosis and fibrosis), in MO Hispanic adults.

Methods: Data from 280 MO Hispanic adults ($N = 102$ men, 178 women) enrolled in a cross-sectional observational study were analyzed. The TMexS (range: 0-12; a higher score indicating higher adherence to a traditional Mexican diet), was calculated from the average of three 24-hour dietary recalls. Hepatic steatosis and fibrosis measurements were assessed using hepatic transient elastography (Fibroscan®). Models were adjusted for age, sex, BMI (kg/m^2), energy intake (kcal/day), and leisure-time physical activity (min/week). Linear regression models testing the association between TMexS and hepatic steatosis and fibrosis were run overall, and stratified by factors with a significant ($p<0.05$) interaction (i.e., sex; birthplace; PNPLA3 risk allele).

Results: Mean TMexS score was 5.9 ffl 2.0, hepatic steatosis score was 289.6 ffl 49.0 dB/m, and fibrosis score was 5.6 ffl 2.2 kPa. No statistically significant associations were found between TMexS and hepatic steatosis or fibrosis in the overall sample. However, sex modified the relationship between TMexS and hepatic steatosis (P -interaction = 0.04) and fibrosis (P -interaction = 0.04). Effect modification was also found between TMexS and steatosis for birthplace (P -interaction = 0.02), and PNPLA3 risk allele carrier status (P -interaction = 0.04). Upon stratification, statistically significant results were only observed for the U.S.-born group; for every additional point in TMexS score there was a 5.7 lower hepatic steatosis points (95% CI: -10.8, -0.4, P -value = 0.03).

Conclusion: Higher adherence to a traditional Mexican diet (as measured by the TMexS) was associated with lower hepatic steatosis among U.S.-born, but not foreign-born, MO Hispanic adults. The role of sex, birthplace, and PNPLA3 risk allele status may be important factors to consider as we advance our understanding of NAFLD in this high-risk population.

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Sociodemographic and Health-Related Correlates of Noticing Calorie Information on Restaurant Menus

Langford AT, Ellis KR, Buderer N

Purpose: To describe correlates of US adults noticing calorie information on menus at fast food and sit down restaurants after implementation of the U.S. Food and Drug Administration's Menu Labeling Final Rule in May 2018; this policy required that restaurant chains with more than 20 locations list calorie information on menus.

Methods: We analyzed data from the National Cancer Institute's 2020 Health Information National Trends Survey (HINTS 5, Cycle 4). Only respondents with complete data for the following variables of interest were included in the analyses: noticing calorie information on menus, age, birth gender, race/ethnicity, education, feelings about income, general health, medical conditions like diabetes, ever had cancer, BMI, whether knowing one is genetically at high risk for developing cancer changes behavior, and use of wearable devices to track health. Odds ratios (OR), 95% confidence intervals (CI), and p-values were calculated. A multivariate logistic regression model was considered using all variables that were univariately significant with $p < 0.10$. Using backward elimination, variables that were not significant with $p > 0.05$ were removed one-at-a-time until the remaining variables were significant collectively with $p < 0.05$.

Results: Complete data were available for 3,090 respondents in the HINTS 5 cycle 4 data set: 1,542 (48.5% weighted) had noticed calorie information on menus and 1,548 (51.5% weighted) did not. Univariately, the odds of noticing calorie information on menus were 1.4 times higher for females than males, 1.8 times higher for college graduates versus non-college graduates, 1.7 times higher among individuals living comfortably on their present income versus those finding it difficult or very difficult, 1.6 times higher for those with excellent or very good health compared to fair or poor health, and 1.9 times higher among individuals who wear a health tracking device. Multivariately, 3 covariates remained significant with higher odds of noticing calorie information on menus: female gender (adjusted OR 1.3), college education (1.6), and wearable device (1.8).

Conclusions: In a nationally representative sample of US adults, noticing calorie information on menus was associated with gender, education, and use of wearable devices.

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Use of Nitrosatable Medications in Pregnancy and the Increased Risks of Pediatric Cancers

Heck JE, Hu YH, Chuang YH, Li CY, Liew Z, Ritz B, Arah OA, Lee PC

Purpose: To explore whether intake of nitrosatable medications in pregnancy is related to increased risks of pediatric cancers.

Methods: We conducted a cohort study of all children born in Taiwan from 2004-2015, linking the Cancer Registry, the Birth Registry, the Registry for Beneficiaries of the National Health Insurance Program, and the Pharmacy Database. The Pharmacy Database includes records and dates of all prescriptions filled in pharmacies in Taiwan. Nitrosatable drugs were identified via Anatomical Therapeutic Chemical (ATC) classification, and we examined overall intake and risk from medication subtypes (secondary amines, tertiary amines, amides). We used Cox proportional hazards modeling to quantify associations between childhood cancers and pregnancy intake of nitrosatable medications, with adjustment for maternal and paternal age, family income, urbanization of residence, and parental employment status.

Results: The cohort included 2,079,037 children, of whom 2068 had been diagnosed with cancer. Overall, any pregnancy nitrosatable drug use was not substantially associated with cancer [all types combined; hazard ratio (HR)= 1.03, 95% confidence interval (CI) 0.94, 1.13] although tertiary amines were associated with cancer risk (HR=1.08, 95% CI 0.99, 1.18). For specific cancer types, we found that acute myeloid leukemia was related to maternal use of amides (HR=1.71, 95% CI 1.21, 2.41). Pregnancy intake of secondary amines was associated with an increased risk of hepatoblastoma (HR=1.40, 95% CI 0.87, 2.25). Weakly elevated risks were seen between pregnancy intake of secondary amines and retinoblastoma (HR=1.30, 95% CI 0.83, 2.03) and germ cell tumors and tertiary amines (HR=1.21, 95% CI 0.90, 1.63).

Conclusion: Although the sample size was small, we observed elevated risk for specific cancer types with pregnancy intake of amides, tertiary amines, and secondary amines.

Analysis of Biospecimen Collection Trends within Newly Funded Research Activities at the National Cancer Institute

Hanisch R, Rogers S, Nelson S, Carrick DM

Purpose: We evaluated the type and characteristics of biospecimens in newly funded National Cancer Institute (NCI) grants and identified trends to better understand current biospecimen use practices and needs.

Methods: An analysis of population-science cancer research grants newly funded by the NCI Division of Cancer Control and Population Sciences that involve biospecimens was conducted. Data was available for 250 peer-reviewed grants active as of March 2022 that were coded as involving biospecimens. Trends in biospecimen source (using existing, newly-collected, or both), funding program and mechanism, biospecimen type, and cancer site under study were identified.

Results: Of all new grants active as of March 2022, 250 out of 682 (37%) used biospecimens. Of all grants using biospecimens, 129 (52%) collected new biospecimens, 88 (35%) used existing, and 33 (13%) used both. The Epidemiology and Genetic Research Program and the Behavioral Research Program funded the highest number of grants involving biospecimens (64% and 28%, respectively). The R01 (used to support discrete, specified, circumscribed research projects) and U01 (research project cooperative agreement) mechanisms funded the highest number of grants involving biospecimens (59% and 14%, respectively). Whole blood, DNA, and tissue (fresh, frozen, paraffin-embedded) were the most highly collected biospecimens (59%, 50%, and 40%, respectively). Breast, colorectal/anal, and prostate cancers were the most common sites under study in grants using biospecimens (30%, 20%, and 10%, respectively).

Conclusion: The majority of biospecimens in newly awarded grants are collected new and intended for a specific research project. The most common types collected (whole blood, DNA, tissue) should be considered against trends in biospecimen requirements for new high-throughput and -omics testing and in research involving screening, diagnosis, and treatment modalities. The use of biospecimens in cross-cutting disciplines (epidemiology, genetics, social, and behavioral) should continue to be encouraged, with an emphasis on collaborative use.

126-T

A Prospective Study of Intra-tumoral Cholesterol Synthesis Enzyme Expression and Lethal Prostate Cancer

Flanagan S, Lis RT, Huang Y, Vaselkiv JB, Allott EH, Finn SP, Lotan TL, Fiorentino M, Kantoff PW, Loda M, *Mucci LA, *Stopsack KH

Purpose: Cholesterol has been implicated in prostate cancer progression via varied mechanisms. Cholesterol can be produced de novo in tumor cells via the mevalonate (MVA) pathway. 3-hydroxy-3-methyl-glutaryl-coenzyme A reductase (HMGCR) is the first rate-limiting enzyme in the MVA pathway and is the target of statin therapy. This study examined whether HMGCR expression in prostate tumors is associated with lethal disease.

Methods: The study population included men diagnosed with primary prostate cancer during prospective follow-up of the Health Professionals Follow-up Study and the Physicians' Health Study for whom archival tumor samples were available. Tissue microarrays were constructed from tumors and stained with a polyclonal anti-HMGCR antibody. HMGCR expression intensity was scored as 1) weak/none, 2) moderate or 3) strong. Lethal prostate cancer was defined as development of distant metastases or death from prostate cancer.

Results: 1098 men with prostate cancer were included. 16% of tumors showed strong HMGCR expression. Among 1082 men without metastases at diagnosis, 96 lethal events occurred over a follow-up of 31 years (median 16.7 years). Compared with weak/no HMGCR expression, tumors with strong HMGCR expression had higher rates of lethality (hazard ratio [HR] 2.20, 95% confidence interval [CI] 1.41-3.44), adjusting for age at diagnosis and Gleason score. Tumors with moderate HMGCR expression tended to have a better prognosis (HR 0.51, 95% CI 0.27-0.95) compared to those with weak/no expression. Examining whether statin use (pre- or post-diagnosis) modified the association between HMGCR expression and lethality was limited by a small number of lethal events among statin users (total n = 26), but estimates were not strongly suggestive of differential associations.

Conclusions: High intra-tumoral cholesterol synthesis, indicated by the expression of HMGCR, was associated with higher risk of lethality in prostate cancer. These findings align with research suggesting active cholesterol synthesis in prostate cancer may be a feature of aggressive disease. Non-linear associations of lower expression levels and the potential impact of interventions with statins requires further study.

Androgens, Stress and Adiposity Accelerate Puberty with Implications for Breast Cancer Risk

Houghton LC, Andrulis I, Knight J, Bradbury A, Buys S, Schwartz L, Daly M, Chung W, Colonna S, John E, Keegan TH, Wei Y, Terry MB

Purpose: The prevailing paradigm for breast cancer (BC) etiology focuses on endogenous estrogen exposure beginning at puberty to explain postmenopausal, but not premenopausal, BC risk. In contrast, androgens are associated with increased pre- and post-menopausal BC risk. We tested the hypothesis that elevated androgens, in addition to childhood adiposity and stress, accelerate pubertal development, an early life risk factor for BC.

Methods: In the LEGACY Girls Study, we measured 36 steroid metabolites grouped as androgens (A), estrogens (E), progestogens (P) and glucocorticoids (G) in two urine specimens. The pre-puberty specimen was in 327 girls and the peri-puberty specimen, after the onset of breast development but before menarche, was in 115 of the 327 girls. Mothers/guardians assessed age at onset of breast development (thelarche) through the Pubertal Development Scale. Girls self-reported age at menarche. Study staff measured participants' body mass index (BMI) and administered questionnaires including the Internalizing Composite Scale (a parent proxy of child stress). We estimated hazard ratios and 95% confidence intervals for the association between steroid metabolites and age at thelarche and menarche using Weibull survival models, controlling for study site, race and ethnicity, and birthweight.

Results: Higher levels of urinary A [1.3 (1.1-1.6)] and P [1.3 (1.1-1.6)] were associated with accelerated thelarche. Peri-pubertal levels of A [1.2 (1.1-1.2)], P [1.3 (1.1-1.4)], and G [1.1 (1.1-1.2)] were associated with accelerated menarche, adjusting for pre-pubertal levels and age at thelarche. Stress and BMI modified the associations with thelarche, but not menarche. The association of A with earlier thelarche was stronger among girls with BMI above the median [1.5 (1.0-2.1)] and who also had internalizing stress above the median [2.0 (1.2-3.2)].

Conclusion: Our results confirm that androgens are associated with accelerated pubertal timing and that BMI and stress modify this association. Mechanisms underlying the puberty and BC association have previously focused on estrogens, menarche and BMI; our results suggest that androgens and stress impact the timing of thelarche with implications regarding the overall etiology of BC.

Colorectal Cancer Molecular Subtypes and Mortality

Ton M, Malen RC, Reedy A, He Q, Burnett-Hartman AN, Newcomb PA, Phipps AI

Purpose: Colorectal cancer (CRC) molecular subtypes, identified based on tumor marker combinations, may play a role in survival. These subtypes reflect different etiologic pathways and relate to differences in the distribution of tumor site, sex, age, and stage of diagnosis. Growing evidence also supports the distinct survival profiles of CRC molecular subtypes.

Methods: Participants from two population-based studies were diagnosed with invasive CRC between 1998 and 2018 and followed for survival. Tumor samples were collected from 2,256 participants and classified into 5 subtypes based on microsatellite instability (MSI), CpG island methylator phenotype (CIMP), and somatic mutations in BRAF and KRAS, as follows: 1) Type 1 (MSI-high, CIMP-high, BRAF-mutated, KRAS-wildtype), 2) Type 2 (microsatellite stable (MSS)/MSI-low, CIMP-high, BRAF-mutated, KRAS-wildtype), 3) Type 3 (MSS/MSI-low, non-CIMP/CIMP-low, BRAF-wildtype, KRAS-mutated), 4) Type 4 (MSS/MSI-low, non-CIMP/CIMP-low, BRAF-wildtype, KRAS-wildtype), and 5) Type 5 (MSI-high, non-CIMP/CIMP-low, BRAF-wildtype, KRAS-wildtype). Multiple imputation was used to impute tumor markers for those missing data on 1-3 markers used in subtype classification. Cox regression was used to calculate hazard ratios (HR) and 95% confidence intervals (CIs) to assess associations between subtypes and CRC-specific mortality, adjusting for sex, smoking history, tumor site, and study.

Results: Compared to participants with the predominant Type 4 subtype (50%), participants with Type 2 tumors (2%) had the poorest survival (HR=1.63, 95% CI: 1.47, 1.81). Participants with Type 3 tumors also had significantly poorer survival (HR=1.19, 95% CI: 1.14, 1.24). In contrast, participants with Type 5 tumors experienced the most favorable survival (HR=0.39, 95% CI: 0.34, 0.44). Observed associations persisted after adjustment for stage. Associations were consistent across strata defined by sex and stage, although associations for Type 2 were most pronounced among males and those with distant stage CRC.

Conclusions: We observed significant associations between CRC molecular subtype and CRC survival, with consistent patterns of association across sex and stage. These findings support the clinical significance of these subtype classifications

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In Utero Exposure to Industrial Pollution and Childhood Cancer Risks

Chen Y, Heck JE

Purpose: To examine the effects of in utero exposure to industrial pollutants on childhood cancer risks. Cases identified from California (CA) Cancer Registry and controls randomly selected from CA Birth Registry (20:1 frequency-matched by birth year) were born after 1998. Our main exposures were listed as pollutants that are high priority for study according to IARC: lead (Pb), nickel (Ni), tetrachloroethylene and 1,1,1-trichloroethane (1,1,1-TCA), while secondary interests were carbon disulfide (CS₂) and cobalt. Exposure to industrial chemicals was assessed by Toxic Release Inventory (TRI) releases in ambient air near the home. Using geocoded addresses, we linked the annual release data to each child based on the year of pregnancy. A buffer model was used to assign “ever/never”_ exposures based on birth address within 3km for main chemicals and 5km for secondary ones of any TRI site or outside of 3km or 5km distance. An inverse distance weighting (IDW) model was used to assign “high/low exposed/unexposed”_ based on the median exposure at 3km or 5km distance. For Pb, we observed a slight increase in teratoma (adjusted odds ratio (aOR):1.51, 95% Confidence Interval (CI):0.97,2.36), comparing high-exposed children to unexposed. Children ever exposed to Pb had an elevated odds for yolk sac tumor (aOR:1.60,95%CI:1.02,2.48). There was a higher odds of Ewing sarcoma in children ever exposed to Ni, comparing to the unexposed (aOR:1.52,95%CI:0.98,2.35). A strong increase in rhabdomyosarcoma (aOR:1.96,95%CI:1.16,3.32) and a slight increase in soft tissue sarcoma (aOR:1.48,95%CI:0.97,2.26) were shown among children ever exposed to 1,1,1-TCA. For CS₂, high-exposed children had elevated ORs for ependymoma (aOR:2.42,95%CI:1.14,5.15) and retinoblastoma (aOR:1.77,95%CI:0.99, 3.14), compared to the unexposed. Ever exposed to cobalt in utero elevated the odds of retinoblastoma (aOR:2.37,95%CI:1.05,5.32) and central nervous system cancers (aOR: 1.68,95%CI:1.09,2.59), particularly astrocytoma (aOR:2.51,95%CI:1.38,4.57) and glioma (aOR:2.25,95%CI:1.39,3.65). The strongest association with cobalt was observed in germ cell tumor (aOR:3.54,95%CI:1.75,7.15) among ever exposed children. Our findings suggested industrial pollutants in ambient air may increase childhood cancer risks.

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Outdoor Air Pollution Exposure and Uterine Cancer Incidence in the U.S.-Wide Sister Study

Brown JA, Ish J, Chang CJ, Lawrence KG, O'Brien KM, Kaufman JD, Sandler DP, White AJ

Purpose: Outdoor air pollution is an established lung carcinogen, but little is known about how it is related to the risk of other cancer types. In addition to carcinogens, air pollution includes endocrine disrupting compounds which may be particularly relevant for hormone-sensitive outcomes, such as uterine cancer. We investigated the association between uterine cancer incidence and residential exposure to particulate matter with an aerodynamic diameter <2.5 μm (PM_{2.5}) and nitrogen dioxide (NO₂).

Methods: We included 34,650 participants in the U.S-wide Sister Study cohort with no prior history of uterine cancer and an intact uterus at baseline (2003-2009). Annual outdoor air pollution concentrations were estimated at each participant's residence using a validated spatio-temporal model. Cox proportional hazards models estimated adjusted hazard ratios (HR) for uterine cancer associated with an interquartile range (IQR) increase in air pollutant levels and increasing exposure quartiles relative to the lowest. Models were adjusted for age, race/ethnicity, level of attained education, neighborhood deprivation measured using the Area Deprivation Index (a census-block group level score of socioeconomic indicators), census region, smoking status, age at menarche, body mass index, menopausal status, hormone therapy use and were mutually adjusted for the other air pollutant.

Results: Over an average of 11.9 years of follow-up, there were 376 incident uterine cancer cases diagnosed in the cohort. An IQR increase in NO₂ (5.9 ppb) was associated with an elevated rate of uterine cancer (HR=1.09, 95% CI: 0.94-1.28), with the highest rate observed among women in the 4th quartile compared to the lowest quartile although confidence intervals were wide (HR=1.14, 95% CI: 0.81-1.60). However, no increase in the rate of uterine cancer was observed per IQR increase in PM_{2.5} (3.3 $\mu\text{g}/\text{m}^3$; HR=0.93, 95% CI: 0.75-1.14).

Conclusions: Higher residential exposure to NO₂, an indicator of traffic-related air pollution, may be related to a higher incidence of uterine cancer in this large prospective study of U.S. women.

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Self-Collection of Microbiome Samples and Leg Circumference Measurements among Endometrial Cancer Survivors: A Pilot Study

Brown JA, Olshan AF, Peery, AF, Bae-Jump VL, Nichols HB

Purpose: Endometrial cancer survivors experience declines in quality of life from lymphedema and sexual and bowel dysfunction following cancer treatment. We conducted a pilot study to assess feasibility and acceptability of self-collection of gut and vaginal microbiome samples, self-measurement of leg circumference, and to collect preliminary data on lymphedema, bowel and sexual function.

Methods: Endometrial cancer survivors were mailed gut and vaginal microbiome self-collection kits; measuring tapes and instructions for leg measurements; and bowel and sexual function and lower extremity lymphedema (LEL) surveys prior to a nurse home visit. Measures of feasibility included completion of microbiome kits and leg measurements. Descriptive feedback was used to assess acceptability. The threshold for LEL was a 10% difference between right and left leg measurements; or > 4 symptoms on the Gynecologic Cancer Lymphedema Questionnaire (GCLQ). The Colorectal Anal Distress Inventory was used to assess bowel function [CRADI-8: 0 (no symptoms) to 100 (maximum symptom severity)]. Lower scores on the Sexual Function Vaginal Questionnaire (SVQ) indicated worse function.

Results: Among 50 participants, 44% were Black women. Mean age was 60.8 years and time from cancer diagnosis was 15.5 months. Mean BMI was 34.9 kg/m². Most women submitted gut (N=43) or vaginal swab (N=47) samples; fewer (N=17) submitted leg measurements. Participants reported moderate to high comfort with microbiome sample collection. Leg self-measurement was difficult due to limited guidance and physical barriers. Among 17 women with nurse and self leg measurements, 24% met criteria for LEL. Sensitivity, specificity, and PPV for self-measurements were 50%, 92%, and 67%, respectively. In the full sample, 24% met criteria for LEL by nurse measurement and 54% met criteria by GCLQ. CRADI-8 scores (mean=54.6) indicated moderate bowel distress. SVQ intimacy and satisfaction scores were on the favorable half of the possible range; 34% of participants reported sexual activity.

Conclusions: Self-collection of microbiome samples, but not lower leg measurements, was feasible and acceptable. Prevalence of LEL was high and bowel distress moderate. Sexual activity was low; but intimacy scores were often favorable.

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Trends and Patterns of Next Generation Sequencing among Cancer Patients in Florida

Hong YR, Wang R, Patel K, Turner K, Bian J, George TJ, Vadaparampil S, Braithwaite D

Purpose: Next-generation sequencing (NGS) testing has been widely implemented and expanded coverage for cancer patients as a component of precision oncology care; however, little is known about its utilization trends and patterns. We investigated real-world evidence of NGS utilization among cancer patients and providers.

Methods: Data were derived from OneFlorida Data Trust, which consisted of electronic health records data from 10 health systems in Florida. We identified patients with diagnosis of any cancer type using ICD-9 and 10 between 2012 and 2021. CPT codes 81445, 81450, or 81455 were used to capture NGS testing. Patient characteristics included age at diagnosis, year of diagnosis, race/ethnicity, sex, insurance type, ZIP code-based household income and education level, cancer site, and Charlson Comorbidity Index (CCI). We conducted bivariate analysis to compare differences in patient characteristics by NGS testing.

Results: Among 688,577 patients with cancer diagnosis (mean age, 62.4 years old; 52.0% female; 50.2% non-Hispanic White), 5,334 (0.8%) had NGS testing. Median time to NGS testing since cancer diagnosis was 65 days (IQR: 9-562). NGS testing rate increased significantly (P for trend <.001) from 2.9 in 2012 to 7.8 per 1,000 person-years in 2021. Cancer patients who had NGS were more likely to be younger than 50 years old (21.2% vs. 17.8%), non-Hispanic White (55.7% vs. 50.1%), and covered by private insurance (26.8% vs. 20.9%) compared with those who did not (all Ps <.001). Patient ZIP code-based household income or education level was not associated with NGS testing. In terms of clinical characteristics, those who had NGS testing were more likely to have multiple cancer diagnoses (71.8% vs. 37.2%) but less comorbidity burden (22.4% with CCI 4+ vs. 28.8%) (all Ps <.001). Among those having NGS testing, 19.4% were diagnosed with leukemia, followed by colorectal (17.5%) and lung (13.8%) cancers.

Conclusions: Although NGS utilization among cancer patients in Florida increased significantly over the past decade, its overall utilization remains low (<1%). Older, racial/ethnic minorities, and those with public insurance coverage were less likely to undergo NGS testing, suggesting potential socioeconomic disparities in access to NGS.

134-T

"I've Never Personally Discussed the Cost of Anything:" Adolescent and Young Adult Cancer Survivors' Experiences and Preferences for Cost-of-Care Conversations in Oncology

van Thiel Berghuijs K, Ray N, Vaca Lopez P, Waters A, Warner E, Tsukamoto T, Kaddas H, Fair D, Lewis M, Perez G, Park E, Kirchhoff A

Purpose: Cancer organizations recommend cost-of-care (CoC) information be provided to cancer patients by their care teams. Little is known about the CoC conversation experiences and preferences of adolescents and young adults (AYAs) with cancer.

Methods: Eligible participants were 18-39 years old, diagnosed with cancer, and insured (N=24). Recruitment occurred at two cancer centers in Utah from 10/2019-03/2020. Data were collected via survey and semi-structured telephone interviews, which were recorded and transcribed. Survey questions contained demographics. Interview questions were asked pertaining to willingness, perceived usefulness, and past experiences with CoC conversations with their cancer care team. Interviews were analyzed by applying two rounds of thematic content analysis. Summary statistics were calculated for demographics.

Results: AYA participants were on average aged 26.4 years, with many currently receiving treatment (62.5%). Most (83%) reported interest in discussing CoC but previous CoC conversations were infrequent (20.8%). Participants preferred CoC conversations to occur with social workers (25.0%), nurses (20.8%), oncologists (20.8%), or support team members like financial navigators or clinic administrators (12.6%), while others just wanted "someone who knows what they are talking about" (20.8%). Three themes emerged: 1) AYAs are willing to participate in CoC conversations despite finances commonly being seen as a taboo topic. 2) AYAs believe CoC conversations could be helpful since they perceive that their care team is familiar with treatment costs and health insurance. 3) Prior experience with CoC discussions were often too brief to be useful ("They've [the nurse navigator] talked to us about finances a little bit, but it's all been very superficial..."). Most AYAs who had previous CoC conversation experiences brought up the topic themselves. AYAs who were not their own insurance policy holder had less interest in CoC discussions.

Conclusions: The AYA population wants to have CoC conversations. Future work includes interventions that guide clinicians in initiating in-depth discussions that cover cost topics and questions that patients find useful.

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Age at Diagnosis and Insurance Literacy Influence Engagement in an Insurance Literacy Educational Program for Adolescents and Young Adults with Cancer: Results from the HIAYA CHAT Pilot Study

Chevrier A, Kaddas HK, Mann K, Waters AR, Perez GK, Park ER, Vaca Lopez PL, Warner EL, Ray N, Allen K, Tsukamoto T, Fair D, Lewis M, Haaland B, Kirchhoff AC

Purpose: Interventions are needed to help cancer patients navigate care and reduce financial toxicity. Relatedly, there is a need to understand who engages in these programs. We report on factors associated with completion of a virtual 4-session health insurance literacy education program designed for adolescent and young adult (AYA) cancer patients.

Methods: AYA patients between the ages of 18-39, <1 year from diagnosis, were recruited from clinical sites in Utah to participate. AYAs completed a baseline survey prior to randomization that included items on demographics, health insurance literacy (confidence using insurance/health insurance terms; 22 items ranging 9-33, >23 to denote high literacy), and financial toxicity (COMprehensive Score for Financial Toxicity; 11 items ranging 0-44, <22 to denote financial toxicity). Intervention sessions were delivered over Zoom every other week, lasting ~45 minutes each. Among intervention participants (N=45), we examined factors (diagnosis age, insurance policy holder status, insurance literacy, financial toxicity, time from diagnosis) related to completion of 4 sessions using Fisher's exact tests. We fit a multivariable logistic regression to examine associations of these factors with the outcome (completion of 4 sessions vs. 0-3).

Results: Participants were 62.2% female, 55.5% their own insurance policy holder, and 14.0% Hispanic. The overall number of sessions completed was 0 (24.4%), 1 (6.7%), 2 (4.4%), 3 (0.0%), and 4 (65.0%). In univariate comparisons, younger AYAs (N=17, age 18-25) were less likely to complete 4 sessions than older AYAs (N=28; age 26-39) (50.0% vs 70.0%, p=0.06). More of the older AYAs had high baseline health insurance literacy scores than younger AYAs (64.0% vs. 35.3%, p=0.07). In the multivariable model, AYAs with higher baseline insurance literacy were less likely to complete all 4 sessions (Odds Ratio [OR]=0.12, 95% CI 0.02-0.90 vs. low literacy). Yet, older AYAs remained more likely to complete all 4 sessions than younger AYAs (OR=6.49, 95% CI 1.00-40.97).

Conclusions: AYAs who engaged fully in an insurance literacy program were older and had lower health insurance literacy. Tailored interventions that address differences by age and literacy levels may increase engagement and impact.

Higher Health Insurance Literacy Is Associated with Reduced Financial Toxicity among Older Adolescent and Young Adult Cancer Patients in the HIAYA CHAT Study

Vaca Lopez PL, Kaddas HK, Chevrier A, Mann K, Waters AR, Warner EL, Ray N, Allen K, Tsukamoto T, Fair D, Lewis M, Perez GK, Park ER, Haaland B, Kirchhoff AC

Purpose: Financial toxicity is common for adolescent and young adult (AYA) cancer patients and can affect treatment adherence. We examined whether health insurance literacy (i.e., knowledge of and confidence using insurance), which is potentially modifiable, is associated with financial toxicity among AYA cancer patients.

Method: Participants were diagnosed with cancer between ages 18-39, <1 year from diagnosis, and completed a baseline survey upon enrollment in an insurance education program. The survey included health insurance literacy (sum of 22 items on confidence using insurance/insurance terms, range 0-34, with higher scores=higher literacy), and COMprehensive Score for Financial Toxicity (COST; 11 items ranging 0-44, <22 indicating financial toxicity). Multivariable logistic regressions adjusted for gender, education, and policy holder status were run to examine the association between health insurance and financial toxicity. Separate models were run by diagnosis age (younger 18-25 and older 26-39).

Results: Of N=86 participants, 68.6% were female and 72.9% White; 34.9% were age 18-25 and 65.1% age 26-39. Most (87.2%) had private insurance coverage and 55.8% reported being the policy holder of their insurance plan. On average, younger AYAs had lower insurance literacy scores than older AYAs, 18-25: 19.8(SD=5.3) vs. 26-39: 24.1(SD=5.0); $p<0.01$. No differences were found by age for financial toxicity (reported by 60.9%). In the multivariable model, higher literacy scores were not associated with lower levels of financial toxicity (odds ratio [OR]=0.94, 94% CI 0.85-1.04) and this remained true when the model was limited to younger AYAs ages 18-25 (OR=1.13, 95% CI 0.94-1.37). However, among AYAs ages 26-39, higher literacy scores were associated with lower odds of financial toxicity (OR=0.76, 95% CI 0.63-0.93).

Conclusion: For younger AYAs, health insurance literacy may be less related to financial toxicity, potentially due to their reliance on family to manage health insurance and finances during treatment.

Among older AYAs, however, higher health insurance literacy is associated with less financial toxicity. Future efforts should discern the causality of this association and how improving insurance literacy can be a tool in addressing financial toxicity.

A Structural Equation Modeling Approach to Understanding Pathways Linking Patient-Centered Communication to Self-Rated Health among Cancer Survivors: HINTS Analysis

De La Torre SA, Spruijt-Metz D, Farias AJ

Purpose: Few studies have investigated the pathways linking patient centered communication (PCC) to more distal survivor-level health outcomes like self-rated health (SRH), therefore, the aim of this study is to investigate the relationship between PCC and SRH mediated by anxiety/depression (A/D) and quality of care (QOC) satisfaction.

Methods: Data on cancer survivors was leveraged from the National Cancer Institute's Health Information National Trends Survey (HINTS) 5 Cycles 1-4 (January 2017-April 2020) (n=1,847). Structural equation modeling (SEM) was used to test the hypothesized direct, indirect, and total effects of pathways linking PCC to SRH. First, a measurement model was tested using confirmatory factor analysis (CFA) on the 2 latent factors, PCC and A/D. After evaluating the fit and factor loadings in the measurement model, a structural model was specified based on the Patient-Clinician Communication framework.

Results: The mean age of the sample was 66.9 years (SD=12.2). Most participants were from a Non-Hispanic White racial/ethnic background (n=1,351, 73.1%) and female (n=1,056, 57.2%). The most frequently reported cancer types were breast (n=262, 14.2%) and skin (n=474, 25.7%) and the average time since diagnosis was 13.5 years (SD=12.7). PCC had significant total (standardized beta (SB)=0.263, $p<0.001$) effects on SRH. However, the direct effects were not statistically significant (SB=0.016, $p=0.737$) and the significant effects came from both of the mediated pathways, the QOC pathway (SB=0.131, $p<0.001$) and the A/D pathway (SB=0.116, $p<0.001$). Lastly, QOC satisfaction was directly significantly associated with SRH (SB=0.166, $p<0.001$).

Conclusions: These results provide evidence of potential pathways linking PCC to proximal and distal survivor-level health outcomes, namely SRH. Providers engaging in PCC, which aims to acknowledge the patient as a whole, and educate survivors in taking an active role in their care, can potentially provide an opportunity to address A/D. Furthermore, PCC can also lead to survivors experiencing a higher QOC satisfaction, which can ultimately have a positive impact on how survivors perceive their overall health and the health care they receive.

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Ability to Eat among Cancer Patients Treated for Malignant Bowel Obstruction: A Secondary Analysis within SWOG S1316

Thomson CA, Anderson GL, Arnold KB, Sun V, Deutsch GB, Deneve JL, Secord AA, Krouse RS

Background: Malignant bowel obstruction (MBO) elicits gastrointestinal symptoms that interfere with dietary intake. The purpose of this research was to collect dietary intake data from patients with MBO who were participating in SWOG S1316 to characterize ability to sustain oral intake during and after treatment for MBO. **Methods:** 199 patients diagnosed with MBO, age 23 to 91 y, were consented to report route for eating/feeding and to complete repeat, telephone-based 24-hour dietary recalls at baseline (during hospitalization), and at weeks 5, 9, and 13. Patients were categorized as: 1) consuming only liquids, 2) consuming only oral supplements (Boost, Ensure), 3) eating solids, but mostly liquids, 4) eating liquids, but mostly solids, 5) on tube feeding with small amounts of oral intake, 6) on tube feeding only, 7) no intake (ice, sips of water). Number of days alive and out of the hospital through 13 weeks defined “good days”_ for patients with MBO.

Results: Over 50% of enrolled participants were deceased by 90 d follow up; response rate for reporting oral intake declined from 64% at baseline to 57% by week 13, among those known to be alive. At baseline, during hospitalization, 128 of 199 patients provided dietary recall information with 48% eating some solids and/or liquids (groups 3,4); 13% on tube feedings (group 6) and 18% no intake (group 7). At week 5, 106/168 patients responded to the recall interview with 67% eating some solid and/or liquids; 2% on tube feeding; and 10% reporting no intake. At week 9, 76/135 patients responded with 78% eating some solid and liquids; 7% on tube feeding and 7% with no intake. At week 13 the eating patterns showed 82% eating some solid and/or liquids; 2% on tube feeding and 5% with no intake among 57/100 respondents. Oral intake was not significantly associated with number of good days ($p=0.52$)

Conclusions: Despite a diagnosis of MBO, half of patients completing the dietary recall during hospitalization to treat MBO reported consuming solids and liquids orally. Among those alive and responding, the percentage of patients consuming solids and liquids orally increased over time possibly indicating survival bias for those able to eat orally. Future efforts will evaluate nutritional adequacy of intake.

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Acceptability of a Mobile Support Tool for Head and Neck Cancer Caregivers

Sterba KR, Graboyes EM, Olsen J, Armeson K, Duan R, Turner MJ, Cooke M, Toll B, Ruggiero K

Purpose: Head and neck cancer (HNC) involves challenging treatments that can lead to swallowing challenges and feeding tube dependence. HNC caregivers encounter distressing nutritional support challenges. This study tested the acceptability of a mobile support tool for HNC caregivers (the Healthy Eating and Recovery Together (HEART) App) and evaluated short-term changes in psychosocial outcomes after use.

Methods: We used a single-group mixed methods design ($N=23$ dyads) with HNC caregivers (78% female, 74% partners) and survivors (70% male, 34% oropharynx cancer). After a dyadic clinic session, caregivers used HEART for 4 weeks. HEART included caregiving and nutritional support, an intake tracker and caregiver toolkit with bi-weekly check-in prompts that triggered resources. Surveys assessed App use, system usability (SUS), ratings and open-ended feedback to evaluate engagement and acceptability; validated instruments assessed outcomes.

Results: App use was variable (average logins=20, range 3-76). Participants most commonly accessed the nutritional support (91%) and caregiver toolkit (83%) sections. Caregivers reported high satisfaction ($SUS=76/100$; range 20-98) with the majority reporting that the App helped them provide care for their loved one (59%), provided practical tips (78%) and supported emotional well-being (48%). Prompt response was higher (70-83% responded) in the first 2 weeks compared to the last 2 weeks (35-61% responded). Satisfaction with nutritional status improved over time in patients ($+0.5$, $p=.07$) and caregivers ($+0.8$, $p=.02$). Depression decreased in patients (-3.2 , $p=.03$) but was stable in caregivers (-1.5 , $p=.76$). Unmet needs decreased in dyads but not significantly ($p>.05$). Nurses rated high caregiver engagement (94%) and preparedness (95%) after sessions. Open-ended feedback highlighted several App benefits, including ease of use and provision of tailored resources. Suggestions to improve included addressing technical challenges with prompts and a preference to receive the App earlier in care.

Conclusions: A mobile support App for HNC caregivers was rated to be acceptable by HNC caregivers and may be a promising tool to support caregiving. HEART should be investigated further and refined to address technical challenges and timing.

Oncology Clinician Perspectives on Supporting Cancer Caregivers: Results from an NCI Community Oncology Research Program (NCORP) Cross-Sectional Survey Study (WF-1803CD)

Sterba KR, Weaver KE, Snively A, Dressler E, McLouth L, Kent E, Adonzio C, Wojtowicz M, Cannady R and Nightingale C

Purpose: Informal cancer caregivers provide complex care in the home setting and experience substantial physical and emotional burdens. Improving caregiver outcomes may depend on clinicians' abilities to identify caregiver needs and facilitate referrals to needed services. This study sought to describe clinician perceptions and preferences for caregiver support practices in the community setting.

Methods: We recruited physicians, advanced practice providers (APPs) and nurses in NCORP practices using a random sampling process based on practice size stratified by clinician type. A cross-sectional survey assessed clinician knowledge, attitudes, and barriers to addressing caregiver concerns and interest in caregiver services. Weighted percentages were calculated overall and by clinician type accounting for clustering.

Results: We enrolled 124 practices (82% multi-specialty, 8% academic, 39% safety net) and 781 clinicians (54% nurses, 18% APPs, 27% physicians). Clinicians reported high perceived importance and responsibility in assessing caregivers' psychosocial (90% and 73%, respectively) and patient care needs (95% and 81%, respectively). However, approximately half of clinicians reported low/moderate self-efficacy in detecting caregiver depression (49%), assessing problems between patients and caregivers (48%) and providing resources (43%). Clinicians reported an average of 9/16 unique major/moderate barriers to implementing caregiver services; the most common barriers rated major/moderate included: other issues being higher priority (65%), lack of process to assess caregiver needs (64%), time constraints (66%), and lack of resources (60%). High interest was endorsed for providing a variety of caregiver services (mean number very/extremely interested=7/13). Nurses reported having the necessary skills to support caregivers (65% agree/strongly agree) followed by APPs (61%) and physicians (39%); a similar pattern was observed for self-efficacy, responsibility and barriers.

Conclusions: Oncology clinicians report high importance and responsibility for caring for caregivers, but need support to enhance their skills. Improved infrastructure, communication strategies and workflows are needed to address practice barriers and capitalize on clinicians' positive attitudes.

Acute Cancer-Related Symptoms and Concerns among Patients Receiving Chemotherapy in the Current Treatment Landscape

Smith KS, Hoogland AI, Welniak T, Nguyen L, Rodriguez Y, Li X, Oswald LB, Carpenter KM, Fischer SM, Li D, Kinney AY, Gonzalez BD, Jim HSL

Purpose: Symptom prevalence and severity among patients treated with emetogenic chemotherapy have been well-documented; however, this literature is ten or more years old and does not reflect current treatment regimens. The current study assesses the prevalence of acute cancer-related symptoms and health concerns 5 days after initiation of moderately- or highly-emetogenic chemotherapy, when symptoms are expected to be most pronounced.

Methods: Cancer patients scheduled for chemotherapy were recruited to a large, multi-site observational study. Participants completed questionnaires on sociodemographics, cancer-related symptoms, and quality of life (QOL) concerns. Clinical data were abstracted via medical record review. Symptoms were evaluated using the Patient Reported Outcomes version of the Common Terminology Criteria for Adverse Events (PRO-CTCAE). Symptoms were considered severe when participants responded "severe" or "very severe". Concerns were assessed using the Functional Assessment of Cancer Therapy-General (FACT-G) measure.

Results: Participants (N=1,174) were on average aged 58ffl13 years and were mostly female (73%), non-Hispanic (89%), and White (86%). The most common symptoms of any severity were decreased appetite (74%), pain (71%), constipation (70%), nausea (67%), and problems tasting food (61%). The most common symptoms rated as severe or very severe were constipation (18%), pain (18%), decreased appetite (13%), nausea (12%), and problems with tasting food (12%). The most common QOL concerns were lack of energy (94%), worries that the condition will worsen (75%), feeling nervous (73%), feeling ill (73%), and sadness (72%). The top items positively contributing to QOL "quite a bit" or "very much" were emotional support from family (93%), satisfaction with family communication about illness (90%), feeling close to partner (90%), family has accepted illness (89%), and support from friends (85%).

Conclusions: Acute patient-reported outcomes and QOL concerns for patients treated with emetogenic chemotherapy have not been established for current treatment agents. Results of this study provide an update to previous literature examining symptom severity and QOL concerns reported by patients in the days after receiving chemotherapy.

142-T

Anti-Diabetic Medication Use and Survival among Cancer Patients with Type 2 Diabetes: A Prospective Study Using Electronic Medical Records Data

Pauleck S, Winn M, Viskochil R, Post A, Richardson S, Hu-Lieskovan S, Litchman M, Colman H, Ulrich CM, Playdon MC, Hardikar S

Conflicting evidence exists on the association of established anti-diabetic drugs with survival in cancer patients; association of newer anti-diabetic agents with survival is unknown.

We utilized data on 2,675 patients diagnosed with primary cancer at the Huntsman Cancer Institute, Utah, who also had a type-2 diabetes diagnosis. Clinicodemographic and cancer treatment data were extracted from electronic medical records and tumor registry between July '16 – January '21. Associations of metformin, sulfonylureas, thiazolidinediones, insulin, SGLT-2 inhibitors, DPP-4 inhibitors, and GLP-1 agonists with overall survival were evaluated using Kaplan-Meier (KM) curves and Cox proportional hazards models.

On average, patients were 63 years old, female, 88% White, 9% Hispanic, with mean BMI 33 kg/m², and consisted of gastrointestinal (20%), breast (15%), lung (15%), urogenital (40%), and skin (10%) cancers. Most (91%) received anti-diabetic agents, including metformin (29%), insulin (26%), sulfonylureas (13%), DPP-4 inhibitors (9%), GLP-1 agonists (8%), SGLT-2 inhibitors (6%), and thiazolidinediones (3%). Median survival time for ever vs. never use of GLP-1 agonists and SGLT-2 inhibitors was significantly longer (3.7 vs. 1.6 years and 4.2 vs. 1.6 years, respectively; $p < 0.05$). Metformin ever use was associated with statistically significant better overall survival [HR (95% CI) = 0.59 (0.45-0.77)] after adjusting for age, sex, race/ethnicity, smoking, BMI, cancer type, cancer treatment, corticosteroid use, and mutually adjusting for other anti-diabetic drug use. Ever use of DPP-4 inhibitors, GLP-1 agonists, and SGLT-2 inhibitors was also associated with better overall survival, though not statistically significant. Ever use of insulin and thiazolidinediones was associated with significantly worse overall survival [adjusted HR (95% CI) = 1.35 (1.05-1.22) and 2.86 (1.47-5.56), respectively].

In conclusion, metformin use was associated with better overall survival in cancer patients. There was a suggestive association of better overall survival with newer anti-diabetic agents, however, it did not reach statistical significance due to limited sample sizes. Further investigation in larger studies is needed to establish the role of newer anti-diabetic agents in cancer survival.

143-T

Association Between Clinical, Demographic Factors, and Substance Use Among Young Adult Survivors of Childhood Cancer

Kim Y, Huh J, Miller KA, Ritt-Olson A, Hoyt MA, Milam JE

Purpose: Childhood cancer survivors are at risk for late effects related to their cancer treatment, but little is known about clinical, and demographic associated with substance use behaviors. The purpose of this study is to examine the associations between substance use behaviors (tobacco, marijuana, e-cigarette, and alcohol) and cancer-related follow-up care, treatment intensity, late effects, depressive symptoms, self-rated health, race/ethnicity, and neighborhood socioeconomic status (nSES).

Methods: Participants were from the Project Forward cohort, a population-based study of young adult survivors of childhood cancer. Participants (N=1,166, Mage=25.1 years) were recruited through the Los Angeles Cancer Surveillance Program (Cancer Registry covering Los Angeles County, California). Multivariate path analyses were performed with substance use as the outcome variables and clinical and demographic factors as independent variables. Covariates included current age and sex.

Results: Substance use was positively associated with being at risk for clinical depression, and inversely associated with cancer-related follow-up care, female sex, current age, Hispanic ethnicity, treatment intensity, and self-rated health. Neighborhood SES was inversely associated with tobacco use, while being positively associated with binge drinking and e-cigarette use.

Conclusions: The results highlight the interrelationship among the clinical and demographic variables and their associations with different substance use. Findings support effective interventions targeting integrative care and health promotion efforts for polysubstance use behavior among CCS. This will help improve long-term outcomes and mitigate the risk for early morbidity.

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Association Between Pre-Surgical Physical Activity and Urinary and Sexual Outcomes in Prostate Cancer Patients Undergoing Radical Prostatectomy: A Prospective Cohort Study

Harper A, Imm KR, Grubb III RL, Kim EH, Colditz GA, Wolin KY, Kibel AS, Sutcliffe S, Yang L

Purpose: To examine the association of pre-surgical physical activity with urinary and sexual outcomes following radical

prostatectomy for clinically localized prostate cancer in the Prostatectomy, Incontinence and Erectile Dysfunction (PIE) study.

Methods: Study participants were recruited from 2011 to 2014 at two US institutions. Participants provided self-reported information on urinary and sexual outcomes using the modified Expanded Prostate Cancer Index Composite (EPIC, scale from 0-100) at baseline (pre-surgery) and 5 weeks, 6 months, and 12 months after surgery. Recent physical activity was assessed using the Community Healthy Activities Model Program for Seniors at the same four time points and was classified into three categories corresponding approximately to tertiles: <5 hours/week (low), 5 to <10 hours/week (moderate), and ≥10 hours/week (high) of moderate-to-vigorous physical activity (MVPA).

Results: Among 401 eligible participants, 38.4%, 35.2% and 26.4% engaged in low, moderate, and high MVPA at baseline prior to surgery. In both multivariable-adjusted linear and logistic generalized estimation equation (GEE) models, urinary function did not vary by MVPA at baseline, or during recovery. For sexual function, multivariable-adjusted linear GEE models suggested that patients with high MVPA had higher sexual function scores ($p = 0.008$) at baseline than those with low or moderate MVPA. During the recovery phase, this difference disappeared at 5-weeks post-surgery, but returned by 6-months ($p = 0.035$) and persisted up to 12-months post-surgery ($p = 0.004$). In multivariable-adjusted logistic GEE models, no significant associations were observed between MVPA and recovery of sexual function, though we did observe a suggestive higher likelihood of recovery of sexual function (OR: 2.42; 95% CI: 0.96-6.08; $p = 0.060$) by 12-months post-surgery among participants engaging in high than low MVPA.

Conclusion: Physically active prostate cancer patients had better and likely earlier recovery in sexual function post-surgery. These findings support the potential for brief exercise prehabilitation to improve side-effects associated with radical prostatectomy.

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Beliefs and Perceptions on Genetic Testing and Precision Medicine based on Cancer Survivorship

Khan S, Patel P, Fuzzell L, Han Y, Langston ME, Lewis-Thames MW, Moore JX

Purpose: To examine differences in beliefs, perception, and awareness of genetic testing and precision medicine between cancer survivors and those without a history of cancer.

Methods: We conducted a cross-sectional study of 3794 respondents (626 cancer survivors; 3168 respondents without a history of cancer) from the Health Information

National Trends (HINTS) Survey 5, Cycle 4. The association between cancer survivorship and genetic testing beliefs and perceptions was assessed using survey-weighted logistic regression with adjustment for age, gender, race, and ethnicity.

Results: Cancer survivors were more likely to have had genetic tests (Adjusted Odds Ratio [aOR]: 1.61; 95% CI: 1.03-2.53) and were more likely to report that they have a lot (vs. somewhat, a little, or not at all) of interest in knowing if they have a genetic change that increases their risk of getting cancer (aOR: 1.65; 95% CI: 1.12-2.44). In contrast, our findings seem to suggest that cancer survivors may be less likely to believe it was very important to know a person's genetic information for preventing cancer (aOR: 0.82; 95% CI: 0.55-1.24) although these findings were non-significant. Cancer survivors and those without a history of cancer had similar beliefs regarding the importance of genetic information for detecting cancer early (aOR: 0.99; 95% CI: 0.68-1.45) and treating cancer (aOR: 1.04; 95% CI: 0.69-1.56). Cancer survivors were no more likely to agree that they would change behavior (diet, exercise and getting routine medical tests) if a genetic test indicated they were at high risk of cancer. There was no difference in knowledge of precision medicine between cancer survivors and those without a history of cancer.

Conclusion: Although cancer survivors were more likely to have had a genetic test and report wanting to know if they have a genetic change that increases their cancer risk, overall cancer survivors' beliefs regarding the utility of genetic tests to detect or treat cancer is no different than those without a history of cancer. Genetic testing and precision medicine can be used for screening, diagnosis, and guiding treatment in patients with cancer. Continued education and outreach are necessary for increasing awareness and uptake of genetic tests and precision medicine.

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Claims-Based Frailty Index among Childhood, Adolescent, and Young Adult Cancer Survivors in Florida

Mobley E, Gerard G, Smotherman C, Hudnell T, Fische J, Anton S, Braithwaite D, Gutter M, Mailhot R, Awad Z, Daly M, Gurka M, Parker A

Purpose: We examined factors associated with frailty using claims and electronic health record data for childhood, adolescent, and young adults (CAYA) diagnosed with cancer prior to age 40 in Florida.

Methods: We identified 22,617 CAYAs diagnosed with cancer from the OneFlorida Data Trust who had at least two cancer-related encounters from 2012-2020 (with at least one encounter occurring prior to age 40). Our analysts

leveraged claims and electronic health record data to produce the Kim Frailty Index (a deficit-accumulation index score) as our dependent variable. We then employed logistic regression models to estimate the odds ratio (OR; 95% confidence interval, CI) associated with having a frailty index score ≥ 0.20 (i.e. "frailty") after adjusting for encounter-based independent variables including insurance, Social Deprivation Index (SDI) quartile, and Rural Urban Continuum Area code. The encounter-based independent variables were modeled using the baseline value and the percentage change from baseline to the encounter of interest, respectively, and all multivariable models adjusted for age, sex, race, and ethnicity.

Results: Of the 22,617 CAYAs in the sample, 1,210 (5%) experienced frailty according to the claims-based Kim Frailty Index. Those with Medicaid, Medicare, dual eligible status (Medicare and Medicaid), or who were uninsured were more likely to experience frailty (Medicaid OR 7.8, 95%CI 5.4-11.3; Medicare 9.7, 5.2-17.8; dual eligible 26.0, 17.2-39.2; uninsured 2.8, 1.8-4.6). Survivors from areas with higher SDI were more likely to experience frailty (third quartile 1.2, 1.0-1.5; fourth quartile 1.2, 1.0-1.5); those from non-metropolitan areas were less likely to experience frailty (0.6, 0.5-0.9).

Conclusions: Survivors who have public insurance, are uninsured, or from a more socially deprived area are more likely to experience frailty, and those from non-metropolitan areas are less likely to experience frailty using a claims-based frailty index. Our is one of the first studies to use a claims-based index to estimate frailty among CAYAs with cancer using an index validated among older adults with Medicare.

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Clinically Relevant Improvements in Quality of Life and Fatigue Following an Exercise Program for Cancer Survivors

Leach HJ, Marker RJ

Purpose: This study utilized data from an existing cancer-exercise program to determine the proportion of participants who achieved minimal clinically important differences (MCID) for quality of life (QOL) and fatigue and explored determinants of achieving MCID.

Methods: QOL and fatigue were assessed pre/post the 3-month exercise program. QOL was measured using the Functional Assessment of Cancer Therapy-General (FACT-G; range 0-108) and fatigue was measured using the Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACIT-Fatigue; range: 0-52). Higher scores reflect better QOL and less fatigue. MCIDs are a change of 5-points for the FACT-G and 3 points for the FACIT-Fatigue. The proportion achieving MCID was calculated, and independent t-tests and chi-square tests explored differences in age, body

mass index (BMI), cancer treatment status, exercise session attendance and baseline QOL/fatigue value between those who did vs. did not achieve MCID. Significant variables were included in binomial logistic regression models.

Results: Participants (N=236) were M=54ffl14.0 years old, majority female (67.8%), white (84.3%), with breast cancer (35.6%). QOL improved ($M\hat{I}=6.3ffl10.8$), and 55.2% achieved MCID. Fatigue improved ($M\hat{I}=5.4ffl9.9$), and 58.7% achieved the MCID. Regression models for QOL [$B=4.13$, $SE=1.29$, $Wald=11.05$, $p=.001$] and fatigue [$B=2.29$, $SE=.907$, $Wald=6.39$, $p=.011$] were significant. For QOL, higher age [$Exp(\hat{I}^2)=.972$, $CI=.948-.996$] and baseline FACT-G score [$Exp(\hat{I}^2)=.945$, $CI=.921-.969$] decreased the likelihood of achieving MCID, and attending more exercise sessions increased likelihood of achieving MCID [$Exp(\hat{I}^2)=1.12$, $CI=.1.04 - 1.96$]. For fatigue, having completed treatment [$Exp(\hat{I}^2)=2.82$, $CI=1.41-5.63$] and attending more exercise sessions [$Exp(\hat{I}^2)=1.13$, $CI=.1.04 - 1.21$] increased likelihood of achieving MCID, and higher baseline FACIT-fatigue score decreased likelihood of achieving MCID [$Exp(\hat{I}^2)=.876$, $CI=.841-.914$].

Conclusions: Starting an exercise program with worse QOL or fatigue, and greater exercise session adherence may increase the likelihood of deriving clinically relevant benefits in these outcomes. In addition, younger age and being finished with active treatment may increase the likelihood of achieving MCID in QOL and fatigue, respectively.

148-T

Comparison of Lifestyle Behavioral Goal Completion in Rural Versus Urban Ovarian Cancer Survivors

Werts SJ, Crane TE, Basen-Engquist K, Freylersthe G, Thomson CA

Purpose: Rural cancer survivors have been reported to exhibit lower adherence to health-promoting lifestyle behavior recommendations than urban cancer survivors. There is a dearth of evidence related to remotely delivered health promotion interventions and no studies specific to remote delivery in ovarian cancer survivors.

Methods: Using diet (food frequency questionnaire) and physical activity (Actigraph) data from the Lifestyle Intervention for Ovarian cancer Enhanced Survival (LIVES) study, we examined the difference in behavioral goal acquisition for rural versus urban survivors. LIVES was a 24-month, 1:1 randomized, controlled trial in which intervention participants were asked to consume four servings of vegetables and two servings of fruit daily and to increase physical activity by an average of 4,000 steps per day. Participants engaged in telehealth delivered coaching calls with trained nutrition science students who utilized

Motivational Interviewing techniques to support behavior change. Zip code data were used to assign Rural-Urban Commuting Area Code (1-3 = urban, 4-10 = rural).

Results: Of the 553 intervention participants with zip code data, 466 (84.3%) were classified as urban- and 87 (15.7%) as rural-dwelling. Average age (59.7ff19.6 years) did not differ between groups. At baseline, rural participants were less likely than urban participants to eat two servings of fruits/day (OR: 0.58; 95%CI: 0.36, 0.92). There were no differences in achievement of fruit, vegetable, and/or physical activity goals by rurality at any timepoint. Participants meeting the vegetable goal nearly doubled for both groups between baseline and 24-months (26.7% to 48.3% for rural; 31.7% to 57.0% for urban). By 24-months, 34.5% of rural (n=30) and 31.3% of urban (n=146) survivors were meeting the step goal. Mean minutes of moderate to vigorous physical activity/day increased by 0.18ff15.2 and 5.66ff121.9 respectively for rural and urban survivors (p-value=0.47).

Conclusions: The remotely delivered, telehealth coaching model used for LIVES was found to be equally effective at increasing diet and physical activity goal completion in rural and urban ovarian cancer survivors, suggesting remote health coaching as a means to promote lifestyle guideline adherence in rural survivors.

149-T

Developing a Risk Prediction Model for Head and Neck Cancer Survival Using Machine Learning

Yang D, Karanth SD, Wheeler M, Guo Y, Bian J, Yoon A, Braithwaite D

Purpose: Machine learning methods can be used to analyze time-to-event outcomes. This study aims to use machine learning methods to develop an alternative risk prediction model for head and neck cancer survival.

Methods: We identified 99,335 patients diagnosed with primary cancer of the oral cavity, pharynx (hypopharynx, nasopharynx, oropharynx), salivary glands, nasal cavity, middle ear, and the larynx between 2006 to 2017 in the United States from Surveillance Epidemiology and End Results (SEER) database. Race, age, sex, marital status, the Yost index (an index for socioeconomic status), treatment type, cancer type, cancer stage, and the number of cancer diagnoses were considered as risk factors. The outcome was head and neck cancer overall survival. Patients were split into a training (70%, n=79,468) set and a validation (30%, n=19,867) set. We used cox proportional hazards model as the baseline model. We then tested three traditional machine learning models for survival analysis including random survival forest, gradient boosted model, and survival support vector machine, and two deep learning methods, including DeepHit and DeepSurv. To evaluate the

performance of the machine learning models, we compared these models to traditional cox proportional hazards model using the c-index. We also measured feature importance using penalized cox model.

Results: In our analysis, the number of deaths in patients during follow-up was 41,572. Overall, machine learning methods outperformed the traditional cox regression (c-index=0.71) in predicting overall survival of head and neck cancer. DeepSurv had the best performance with a c-index of 0.98, followed by random survival forest (c-index=0.74), gradient boosted model (c-index=0.73), survival support vector machine (c-index=0.73), and DeepHit (c-index=0.71). Results of feature importance assessment from both random forest and penalized cox model both suggested that the most favorable variable for survival was the early stage; the most unfavored factor was old age.

Conclusion: Our study suggests that machine learning methods can be used to better predict head and neck cancer survival compared with the traditional cox model based on the c-statistic.

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Evaluation of a Program to Increase HPV Vaccination Rates among Childhood Cancer Survivors across Five Pediatric Oncology Sites in the Texas Pediatric Minority Underserved NCORP

Shay LA, Teixeira RA, Embry L, Aguilar C, Grimes A

Purpose: Childhood cancer survivors (CCS) are at increased risk of HPV-related cancers and yet are under vaccinated as compared to peers without a history of cancer. Prior to this study, few pediatric oncology settings provided HPV vaccines on site. We developed and implemented an intervention in pediatric oncology settings to increase HPV vaccination rates among CCS.

Methods: Five pediatric oncology programs that are part of the Texas Pediatric Minority Underserved NCORP participated in the program. At each site we conducted annual HPV vaccine education programs including best practices for making strong HPV recommendations. We also worked with each site to develop individualized plans for providing the HPV vaccine in their clinics during regularly scheduled visits with CCS who were aged 9-26 and at least 6 months off active treatment. We assessed HPV vaccine initiation (at least 1 dose) and completion (3 doses) at baseline and annually and compared these rates to Texas and U.S. vaccination rates.

Results: At baseline in 2018, the overall rate of HPV vaccine initiation for CCS across the 5 participating sites was 30% and completion rate was 15%, which was significantly lower than 2018 NIS-Teen rates for both Texas (60% initiation, 44%

completion) and U.S. (68% initiation, 51% completion). As of August 2022, HPV vaccine rates among CCS who had been seen at the 5 participating sites since baseline had increased to 88% overall at initiation (including 91% of female CCS, 86% of male CCS) and 53% overall at completion (including 56% of female CCS, 50% of male CCS). This represents a 261% increase in HPV vaccine completion among CCS since baseline. These CCS rates exceeded the rate of completion in Texas (52% overall, 55% female, 48% male) and neared the 62% completion in the U.S (64% female, 60% male) using 2021 NIS-Teen data.

Conclusions: Recommending HPV vaccine to CCS and offering the vaccine on-site at oncology clinics is a feasible and effective way of increasing HPV vaccines among this vulnerable group. Future work should expand this to other oncology settings and make HPV vaccination, a form of cancer prevention, a standard of care for CCS.

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Experiences of Younger Asian American Women with Metastatic Cancer

Kim JHJ, La Cava S, Lu Q, Kagawa-Singer M, Stanton AL

Background: Younger women with metastatic cancer remain an understudied population. Unique challenges may occur for women of Asian heritage, especially if a cancer diagnosis is stigmatized, misunderstood, and/or not discussed openly in their community. The experiences of younger Asian-heritage women and their social contexts need to be better understood to develop adequate survivorship care plans and resources.

Method: Thematic analysis was used to examine ten semi-structured interviews with Asian-heritage women diagnosed with metastatic solid cancer prior to age 50 in the U.S.

Results: Women (8 Chinese Americans, 1 Korean American, 1 Vietnamese American) were, on average, 40 years old (SD=6.24) when diagnosed with metastatic cancer (8 breast, 1 lung, 1 pancreatic; 8 de novo, 2 recurrent). Five were foreign-born, having immigrated during adolescence or young adulthood (M Age=17.00, SD=11.75). Three of the women are mothers. Preliminary themes describe the women facing the unexpected with having metastatic cancer at a younger age; information/support gaps due to not knowing other younger women; others forgetting about their metastatic cancer because they look normal; new priorities of reducing stress or caring for family; and a dearth of psychosocial support for self and loved ones. Notable circumstances specific to cultural factors and an immigrant background were: intergenerational gaps with parents in beliefs about cancer, styles of communication, and preferences for disclosure; communication gaps in receiving healthcare despite speaking English; language

barriers with parents/relatives when describing their health condition; and geographic barriers preventing sharing their diagnosis with family living abroad. One woman described significant challenges during late pregnancy, having received their metastatic cancer diagnosis right before giving birth.

Conclusion: More awareness about younger women with metastatic cancer is needed, especially the experiences of women from diverse cultural backgrounds. Accessible and tailored psychosocial support is sparse for younger Asian American/immigrant women with metastatic cancer and their families.

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Fertility Treatment Involving Gestational Carriers after Cancer

Nichols HB, Wardell A, Deal A, Wantman E, Mersereau J, Spandorfer S, Murugappan G, Baker V, Anders C, Mitra S, Green L, Cai J, Luke B

Purpose: Fertility counseling for reproductive-age cancer patients is universally recommended by professional reproductive medicine and cancer societies. Some cancer treatment-related effects on future fertility may not be avoidable. For example, fertility-sparing surgery can be considered for some, but not all, gynecologic cancers. Gestational carriers are individuals who carry a genetically-unrelated pregnancy for others, typically using in vitro fertilization (IVF). Although allowable in most states, there is a wide range of cost and legal protections surrounding these practices. We evaluated characteristics related to fertility treatment involving gestational carriers after cancer.

Methods: We linked data from seven statewide cancer registries with the national Society for Assisted Reproductive Technology Clinic Outcomes Reporting System during 2004-2018. Using the linked data, we identified women with ≥ 1 thaw-to-transfer IVF cycle following a cancer diagnosis. Multivariable modified Poisson models with robust variance error were used to estimate prevalence ratios (PR) and 95% confidence intervals (CI) for transfer attempts involving a gestational carrier.

Results: Overall, 17.8% of 760 women who used IVF to attempt pregnancy after cancer involved a gestational carrier. Gestational carrier involvement was most common among women with breast (19.0%) or gynecologic (35.6%) cancer, who were living in Massachusetts (26.2%), and those ages 31-35 and 36-40 at cancer diagnosis (16.2% and 16.8%, respectively). PRs for involving a gestational carrier were higher for those who initiated IVF for fertility preservation rather than after cancer treatment (PR=2.01; 1.45, 2.79), and among those who had any recorded chemotherapy (PR=2.16; 1.54, 3.03) compared to none. Gestational carrier involvement appeared less common

in minoritized racial and ethnic groups (9.4%) compared to non-Hispanic White survivors (14.9%)(PR=0.65; 0.40, 1.04), and did not vary according to use of autologous versus donor oocytes or embryos.

Conclusions: Gestational carriers contributed to IVF-related pregnancy attempts in approximately 1 in 6 cancer survivors. The potential role of gestational carriers is a critical component of fertility counseling for cancer survivors.

153-T

Frailty and Comorbidities among Young Adult Cancer Survivors in a Mobile Physical Activity Intervention Trial

Coffman EM, Smitherman AB, Willis EA, Ward DS, Tate DF, Valle CG

Purpose: The physical frailty phenotype identifies individuals at risk for adverse health outcomes but has rarely been assessed among young adult cancer survivors (YACS). This cross-sectional analysis estimated the prevalence of frailty and comorbidities and examined their associations with baseline characteristics of 280 YACS participating in a mobile physical activity (PA) intervention trial.

Methods: We used the FRAIL index (fatigue; resistance (i.e., difficulty with stairs); ambulation (i.e., difficulty walking); illness; and weight loss; pre-frail = 2, frail ≥ 3 components). We compared frailty status and comorbidity percentages by baseline characteristics using chi-square tests. We estimated prevalence ratios (PR) for the independent association between participant characteristics, frailty status, and comorbidities using Poisson regression models.

Results: YACS (82% female, M=33.4ffl4.8 yrs, M=3.7ffl2.4 yrs post-diagnosis) completed questionnaires at baseline. The prevalence of frailty was 14% and prefrailty 24%; the most frequently reported components were fatigue (70%), resistance (38%), and ambulation (14%). Prevalence of frailty/prefrailty was associated with BMI >25 (BMI 25-30, PR 1.66, 95% CI: 1.00-2.77; BMI >30 , PR: 2.26, 95% CI: 1.42-3.60). Self-reported moderate-to-vigorous PA (compared to none) was associated with reduced likelihood of frailty (1- <60 min/wk, PR: 0.56, 95% CI: 0.35-0.80; 60+ min/wk, PR 0.61, 95% CI: 0.40-0.91). Most (55%) YACS reported >1 comorbidity; depression (38%), thyroid condition (19%), and hypertension (10%) were most frequently reported. Men were less likely to report >1 comorbidity (37% vs. 59%; PR 0.63, 95% CI: 0.42-0.93). Treatment with surgery plus chemotherapy or radiation (PR 1.75, 95% CI: 1.08-2.80), BMI >30 (PR 1.33, 95% CI: 1.00-1.76), and being a current/former smoker (PR 1.31, 95% CI: 1.02-1.67) were associated with increased likelihood of >1 comorbidity.

Conclusion: Prevalence of frailty and comorbidities among YACS enrolled in a PA intervention trial was similar to other YACS cohorts and may be an indicator of increased risk for poor outcomes. Future lifestyle interventions should consider targeting determinants of frailty and consider how frailty modifies the effects of lifestyle interventions in YACS.

154-T

Healthcare Access Barriers by Race/Ethnicity and Self-Reported Health Among Adolescent and Young Adult Cancer Survivors

Meernik C, Dorfman C, Zullig LL, Lazard A, Fish L, Nichols H, Oeffinger K, Akinyemiju T

Purpose: Adolescent and young adult (AYA) cancer survivors are at risk of treatment-related late effects but face barriers in accessing follow-up care.

Methods: AYA survivors (aged 15-39 years at diagnosis) were identified from the UNC Cancer Survivorship Cohort; eligible participants were aged ≥ 18 years at enrollment and had an appointment at a UNC oncology clinic during 2010-2016. The analytic sample was restricted to survivors who were ≥ 1 year post-diagnosis. We examined the prevalence of self-reported dimensions of healthcare access (HCA), overall and by race/ethnicity: affordability (ability to pay); accessibility (location of services); availability (quality, volume of services); accommodation (organization of services); and acceptability (attitudes toward providers). We used modified Poisson regression to estimate prevalence ratios (PRs) and 95% CIs for the association between HCA dimensions and self-reported health, adjusted for age at diagnosis, time since diagnosis, sex, and race/ethnicity.

Results: The sample included 135 AYA survivors who were a median age of 34 (IQR: 29-37) years at diagnosis and 4 (IQR: 2-10) years from diagnosis. The most common cancer type was breast (41%). The sample included 74% non-Hispanic (NH) white, 16% NH Black, and 7% Hispanic survivors. A majority (70%) of survivors, and particularly NH Black survivors (90%), reported delaying/forgoing care in the past year because of ≥ 1 HCA barrier, including acceptability (50%), affordability (31%), availability (22%), accommodation (20%), or accessibility (6%). Compared to NH white survivors, NH Black survivors more frequently reported barriers of acceptability (75% vs. 46%). Nearly one in three survivors (29%) reported fair or poor health. Affordability barriers were associated with an increased likelihood of self-reported fair/poor health (PR: 1.92, 95% CI: 1.12-3.28). Health status was not associated with other HCA dimensions.

Conclusions: Among AYA survivors who were accessing care at a comprehensive cancer center, HCA barriers were

related to a high prevalence of delaying or forgoing care, particularly among NH Black survivors, and can contribute to worse health. Findings highlight the need to target specific barriers to care for AYA survivors to improve health.

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Impact of the COVID-19 Pandemic on the Quality of Breast Cancer Survivorship Care

Wallner LP, Mullins MA, Fungal AKC, Tocco R, Hamilton AS, Ward KC, Hawley ST, Radhakrishnan A

Background: The COVID-19 pandemic has significantly disrupted many aspects of cancer care. However, the extent to which it has disrupted survivorship care and its impact on disparities in the receipt of guideline-concordant survivorship care is unclear.

Methods: The iCanCare study is a population-based, longitudinal study of women diagnosed with breast cancer in 2014-15 identified in the Los Angeles and Georgia SEER registries. Women were surveyed during initial treatment and again approximately 6 years later in survivorship (2021-2022) (Expected final N=1430, 60% current response rate). An impact of the COVID-19 pandemic scale was created by averaging participant responses to 5 questions which asked whether the following were worse or better during the pandemic (5 pt. Likert type scales): Ability to get general preventive care, breast cancer follow-up care, fill/re-fill medications, and communicate with primary care and oncology providers. The scale was then categorized as high (>3) vs. low impact (≤3). Guideline-concordant surveillance mammography and preventive care (flu vaccine, colorectal and cervical cancer screenings) were defined as participant-reported receipt in the last 2 years among those eligible based on guidelines and screening history. The associations between the impact of COVID-19 and race/ethnicity on receipt of guideline-concordant surveillance and preventive care were evaluated using multivariable logistic regression.

Results: In this preliminary sample of 1252 women, 40% reported the COVID-19 pandemic had a high impact on their survivorship care. A greater proportion of Latina and Asian women reported a high impact compared to white women ($p < 0.001$). Women who reported a greater impact of COVID-19 were less likely to receive colorectal cancer screening (aOR: 0.7, 95% CI: 0.5-0.9). Latina women were less likely to receive mammography (aOR: 0.2, 0.1-0.6). Black women were less likely to receive flu vaccines and cervical cancer screening (flu vaccine aOR: 0.5, 0.3-0.8; cervical cancer screening aOR: 0.1, 0.03-0.4).

Conclusions: Additional strategies to ensure breast cancer survivors receive guideline-concordant survivorship care are likely necessary to mitigate the negative effects of the pandemic, particularly for women of color.

156

Improving Cancer Research through Empathic Instructional Design: The Citizen Scientist Cancer Curriculum

Brishke JK, Jones ZP, Shenkman EA

Citizen Scientists (CSs) at the University of Florida (UF) health science center provide a critical piece of research that is often unavailable to researchers: community perspective. This was made possible partly through an online curriculum about clinical research basics created for, and with, CSs. Recently, the UF Health Cancer Center (UFHCC) has implemented a similar approach to its research and created a course focused solely on cancer research, the CS Cancer

Curriculum: This course is a companion piece to the clinical research course and relies on the same instructional design principles. However, as cancer can be a sensitive subject, the research team felt a more empathic approach was necessary. This was reinforced by feedback from a needs assessment where every CS reported personal experience with cancer.

Purpose: The purpose of this study was to determine whether an empathic approach to instructional design helped CSs feel prepared to engage in cancer research.

Methods: The research team applied the Self-Determination Theory to the course and its assessments. Storytelling was used to make a patient case study more relatable to the CSs. The patient's story was presented over several video interviews with the patient, family, and physician. Each video was accompanied by a link to the National Cancer Institute support services page. Reflective questions were also added to the didactic quizzes throughout the course.

Results: For the nine CSs completing the course as part of a pilot test, the average total score for all quiz questions in the course was 95.6%. Two CSs had perfect scores and an additional three CSs missed only one question. Most (86%) of the post-test respondents felt they were capable of applying what they had learned.

Conclusions: Relying on empathic approaches to this topic respected the lived experiences of CSs which allowed them to relate to, and be empowered by, the content and feel capable of applying it to their work. The CSs in this cohort are already positively impacting studies at UFHCC. They are a great example of the impact that community stakeholders can have on cancer research if we, as researchers, are willing to adjust our approach to the partnership.

157-T

Multimorbidity and the Receipt of Cancer Survivorship Care Plans: Findings from the 2020 Behavioral Risk Factor Surveillance System survey

Oyinbo AG, Castaneda-Avila MA, Tisminetzky MS, Faro JM, Epstein MM, Lapane KL

Purpose: To examine the association between multimorbidity (two or more chronic conditions) and the receipt of a survivorship care plan (SCP) in a nationally representative sample of cancer survivors, and to investigate whether this association differs by survivors' major source of health care.

Methods: Participants were United States adults with a self-reported history of cancer who were not currently receiving cancer treatment (n=7,337) and were part of cross-sectional data from the 2020 Behavioral Risk Factor Surveillance System. Receipt of an SCP was defined as having received a written or printed summary of all cancer treatments received and instructions for follow-up care. Multimorbidity was assessed using counts from a set of self-reported chronic conditions (cardiovascular disease, asthma, chronic obstructive pulmonary disease, arthritis, depressive disorder, kidney disease, diabetes, and obesity), and categorized as 0, 1, 2, or 3+ chronic conditions based on the sample distribution. Multivariable logistic regression models assessed the association between multimorbidity and the receipt of an SCP, adjusting for several potentially confounding variables.

Results: Most study participants were 65 years or older (62%), women (58%), non-Hispanic White (83%), and presented with 1 chronic condition (30%). Arthritis (48%), obesity (34%), and depressive disorder (22%) were the three most common comorbid conditions. Nearly half (45%) of participants reported having received an SCP. Participants with 3+ comorbid conditions were less likely to have received an SCP (aOR: 0.76, CI: 0.60-0.96) as compared to those without multimorbidity. Multimorbidity was associated with a lower likelihood of receiving an SCP (aOR: 0.72, CI: 0.53-0.96 for 3+ comorbid conditions) among participants whose care was mostly managed by primary care physicians, but not for those whose care was managed by specialist doctors.

Conclusion: Our findings suggest an inverse association between multimorbidity and the receipt of an SCP among cancer survivors. Since several major professional organizations recommend that all cancer survivors receive SCPs, further studies are needed to elucidate contextual factors associated with healthcare providers' delivery of SCPs to patients with multimorbidity.

158-T

Participation in Daily Life Among Individuals Newly Diagnosed with Cancer: A 6-Month Longitudinal Study

L'Hotta AJ, Yan Y, Davis AA, War SM, Chhed MG, Tan BR, Lyons KD, Park Y, King AA

Purpose: To determine how participation in daily life is impacted during the first six-months following a new cancer diagnosis and to identify risk factors for participation restrictions. Patient-reported outcomes (PROs) were used to suggest referrals to rehabilitation services.

Methods: Participants (n=123) were adults (>18 years) with newly diagnosed primary brain, breast, colorectal, or lung cancer. PROs were collected one, three, and six-months post diagnosis. Daily life participation was assessed through the Community Participation Indicators (CPI) (score range: 0-1) and Patient-Reported Outcome Measurement Information System (PROMIS) ability to participate subdomain, (score range: 20-80; mean: 50, SD: 10). PROMIS-43 Profile was also completed. Linear mixed effect model with random intercept evaluated change in participation over time.

Results: Total sample mean CPI score was 0.56; patients reported mildly impaired participation based on PROMIS scores (baseline: 46.19, 2-month follow-up: 44.81, 5-months: 44.84). However, no statistically significant changes in participation were observed over the study period. Risk factors for lower participation included receiving chemotherapy, lower physical function, higher anxiety and fatigue, and change in employment, $p < 0.05$. PROs indicated roughly half of participants may benefit from physical or occupational therapy or mental health support, but only 20-36% of individuals who would benefit from supportive services were referred by their medical team.

Conclusion: People newly diagnosed with cancer experience impaired participation, but they are infrequently referred to supportive services such as rehabilitation. The use of PROs to assess participation, physical function, and mental health can promote access to supportive care services by identifying patients who may benefit from rehabilitation beyond those identified through routine clinical care.

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Reach and Effectiveness of Tobacco Dependence Treatment Programs Implemented in the NCI Cancer Center Cessation Initiative

Bird JE, Pauk D, Minion M, Adsit RT, Fiore M, Rolland B

Purpose: Tobacco cessation among cancer patients results in improved health outcomes, yet cessation services are

not consistently offered in oncology settings. We report on the reach and effectiveness of the tobacco dependence treatment programs (TTP) implemented in NCI-Designated Cancer Centers as part of the Cancer Moonshot-funded program, the Cancer Center Cessation Initiative (C3I).

Methods: 33 cancer centers reported screening of patient tobacco use and smoking prevalence from July-December 2021. Reach (percent of patients who smoke receiving cessation services) was reported overall and by type of services delivered. Seven-day prevalence smoking abstinence at 6-months post-engagement was measured among program participants at 26 centers.

Results: From July-December 2021, C3I cancer centers reported seeing 884,592 patients, 739,770 of whom were screened for tobacco use, and 62,108 patients reported current tobacco use. A total of 9,161 and an average of 18% of patients with documented smoking status were reached and enrolled in a TTP (range 0-82%, median 17%). On average, 41% of patients offered a TTP were enrolled in telehealth services, 35% were provided medical treatment, 19% were enrolled in in-person services, and 13% in web-based services. Among patients enrolled in cessation services for 6 months, 15% on average reported 7-day abstinence from tobacco (range 0-67%, median 11%), which is consistent with effectiveness across other clinical trials.

Conclusion: Patients at C3I centers with cancer who smoke were reached most often with remote-based programs and medical treatment; a smaller percentage of patients were connected to in-person services, which was also the case at C3I centers in 2019 before the COVID-19 pandemic. Implementing population-based tobacco treatment programs in oncology settings can reach large numbers of cancer patients who smoke and may lead to improved cessation and treatment outcomes.

160-T

Sleep after Breast Cancer: Predictors of Distinct Insomnia Trajectories in Premenopausal Women

Beverly Hery CM, Peng J, Janse SA, Van Zee KJ, Naftalis EZ, Paskett ED, Naughton MJ

Purpose: Sleep disruptions are common in cancer survivors and can negatively impact quality of life. Young breast cancer survivors face unique challenges and may have distinct sleep patterns. We examined trajectories of sleep quality/insomnia over 3 years among young survivors.

Methods: 836 women, ≤ 45 years old with stage I-III breast cancer, were recruited to the Menstrual Cycle Maintenance and Quality of Life After Breast Cancer Study within 8 months of diagnosis. Sleep was assessed at 6-month intervals from baseline through 3 years post-recruitment, using the

Women's Health Initiative Insomnia Rating Scale (WHIIRS), a measure of sleep quality and insomnia symptoms. Group-based trajectory modeling was used to identify distinct trajectories of insomnia symptoms. The final model was chosen by comparing the average posterior probability of assignment (PPA) and examining the distinctiveness and interpretability of the trajectories. Key demographic, quality of life and clinical factors were assessed in multinomial logistic regression models as predictors of group membership.

Results: The mean age of participants was 38 years (range: 20-45 years) at enrollment. Three distinct sleep trajectories were identified: low probability of insomnia ($n=277$, 33.1%), moderate probability ($n=354$, 42.4%), and high probability ($n=205$, 24.5%). Average PPA was between 75%-82% for each group. WHIIRS scores were relatively stable over time. Insomnia symptoms were worse at baseline, but improved for the low probability and moderate probability groups. Older age ($p=0.03$), lower education ($p=0.03$), lower income ($p=0.04$), having received chemotherapy ($p=0.003$) and/or hormone therapy ($p=0.02$), hot flashes ($p=0.007$), night sweats ($p=0.001$), and lower SF-12 physical ($p<0.0001$) and SF-12 mental health component scores ($p<0.0001$) were associated with participants in the moderate and high probability insomnia groups.

Conclusion: Insomnia symptoms are problematic for some young breast cancer survivors. We identified three distinct sleep trajectories and factors associated with sleep problems. Analyses such as this enable us to identify high-risk patients that could benefit from sleep interventions to address this important survivorship issue.

161-T

The Association of Cancer History with COVID Risk, Symptom Severity, and Psychological Impact Among Postmenopausal Women: Results from the Women's Health Initiative

Zhang X, Hery CB, McLaughlin E, Woods N, Anderson G, Harris H, VoPham T, Von Ah D, Garcia L, Shadyab A, Follis S, Paskett ED

Purpose: To examine the risk of COVID, long COVID, symptom severity, and psychological impact between postmenopausal women with and without a history of cancer.

Methods: Participants from the Women's Health Initiative (WHI) who completed the COVID survey were included. Data on testing for COVID-19, hospitalization, symptoms, concerns about the COVID-19 pandemic, and anxiety were used. Long COVID was defined as any COVID symptoms lasting ≥ 8 weeks. Multivariable linear regression and logistic regression were used to examine the association between cancer history and outcomes adjusting for other covariates.

Results: Among the included women (n=37,289), 75.8% were ≥80 years, 87.3% were Non-Hispanic (NH) White, and 31% (n=11,567) had a history of cancer. Compared to women without a history of cancer, women with a history of cancer were more likely to be tested for COVID (42.6% vs. 39.9%, P<0.001). No differences were observed on COVID positivity (8.4% vs. 9.1%, P=0.18), hospitalization (1.1% vs. 1.1%, P=0.74), number of symptoms (5.5 vs. 5.2, P=0.26), and long COVID (39.9% vs. 35.2%, P=0.12) comparing women with vs. without a history of cancer. Women with a history of cancer were more likely to report brain fog as a COVID symptom (32% vs. 25.9%, P=0.03). Lower education attainment (vs. graduate degree), married or divorced (vs. single), or living in South or Midwest region (vs. northeast) were associated with increased risk of COVID positivity (all P<0.05). Among women who tested positive for COVID, older age, being NH Black (vs. NH White), Hispanic (vs. NH), and income of \$35-49.9K (vs. \$75K+) were associated with higher odds of hospitalization (all P<0.05). Older age was associated with fewer COVID symptoms (LS Mean for a 10-year increase=-1.27, 95%CI: -1.79, -0.76). Concerns about the COVID pandemic and anxiety scores were similar between women with and without a history of cancer.

Conclusions: History of cancer was not associated with increased risk of COVID, symptom severity, long COVID, concern about COVID, or anxiety. Future studies need to identify strategies to address higher hospitalization and greater psychological impact of COVID for certain populations (e.g., low-income/education, racial/ethnic minorities).

162-T

The Role of Astrocyte Elevated Gene-1 (AEG-1), A Novel Multifunctional Protein, In Chemotherapy-Induced Peripheral Neuropathy.

Mckiver BD, Bryan T, Patel S, Sarkar D, Damaj MI

Purpose: Using genetic mouse models we determined the therapeutic potential of targeting Astrocyte Elevated Gene 1 (AEG-1), an endogenous mediator of inflammation, for the treatment of Chemotherapy-Induced Peripheral Neuropathy.

Methods: Adult AEG-1 global knockout (KO) and wildtype (WT) male and female mice (C57BL/6J background) were used in a model of CIPN produced by administration of a cumulative dose of 32 mg/kg, i.p. injections of paclitaxel. Mechanical hypersensitivity and cold sensitivity were assessed via Von Frey filaments and acetone test, respectively. Electrophysiological activity of peripheral nerves was assessed via caudal tail nerve conduction assay. mRNA expression in the dorsal root ganglia (DRG) was quantified via qRT-PCR. Plasma level concentrations of paclitaxel were assessed via mass spectrometry.

Results: Unlike their WT counterparts, AEG-1 KO mice displayed protection from paclitaxel-induced mechanical hypersensitivity, cold sensitivity, and peripheral nerve dysfunction. Paclitaxel increased the expression of AEG-1 and multiple pro-inflammatory cytokines (TNF α , IL1 β , IL-6) in the DRGs of WT mice. However, pro-inflammatory cytokines levels were unchanged in paclitaxel treated AEG-1 KO mice. Plasma concentration levels of paclitaxel did not differ between AEG-1 KO or WT mice.

Conclusions: Our data suggest that AEG-1 plays a significant role in the development and maintenance of multiple paclitaxel-induced pathologies associated with CIPN. The prevention of CIPN by AEG-1 genetic deletion seems to be mediated by neuroinflammation reduction in the DRGs. These data lead us to conclude that targeting AEG-1, potentially with the use of targeted nanoparticles-conjugated to AEG-1 siRNA, may be a significant step towards the development of treatment strategies specifically aimed at preventing or reversing CIPN.

163-T

Tobacco Use, Symptom Burden, and Symptom Management Perspectives among Adults with Cancer: Baseline Results from 9 ECOG-ACRIN Clinical Trials

Price SN, Lee J-W, Gareen IF, Kircher SM, Kumar SK, Mayer IA, Saba NF, Fenske TS, Atkins MB, Hodi FS, Kyriakopoulos C, Tempany-Afdhal CM, Shanafelt TD, Park ER, Wagner LI

Purpose: Although extant research links tobacco use with worse treatment outcomes among adults with cancer, patient perceptions of the relationship between tobacco use and cancer-related symptoms are relatively unknown. Understanding the relationship between tobacco use and symptoms may help to inform tobacco treatment interventions tailored to the needs of individuals with cancer.

Methods: This study includes enrollment data from 740 adults with breast, head and neck, leukemia, lymphoma, melanoma, myeloma, or prostate cancer enrolled in 9 ECOG-ACRIN Cancer Research Group trials (8 therapeutic, 1 imaging). Patient-reported outcomes included symptom severity and a modified Cancer Patient Tobacco Use Questionnaire. Patients who reported smoking within the last 30 days were considered currently smoking. The effects of smoking status (current, former, never) on the presence of each symptom (experienced at least “a little bit”) were evaluated using logistic regression. Fishers exact test was used to compare the prevalence of patients reporting that smoking helps with each symptom by smoking status (current vs. former).

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