disparities in the patterns of treatment and survival, but these studies are performed in academic tertiary centers with populations comprised mainly of referral patients with limited follow up. No studies have been performed within vertically integrated health systems. **Methods:** The Henry Ford Health System's Virtual Data Warehouse was queried to obtain data on head and neck cancer patients diagnosed between 1990 and 2013. Search criteria included all tumors of the upper aerodigestive tract including SCC, salivary gland malignancies and also endocrine tumors. Mortality data was obtained from SEER and Michigan State mortality data. Follow up was 20 years. Both HMO and non-HMO patients were included within the study. Statistical analysis was performed using chi-squared test. **Results:** 1364 thyroid cancers, 225 salivary gland cancers and 1376 aerodigestive SCCs were found. Statistically significant survival differences were found with regard to race and gender in several tumor types. For thyroid malignancies, females and Non-African Americans had a statistically significant improved survival ($P = 0.0073$ and $P < .0001$). For salivary gland malignancies, females and African Americans had a statistically significant improved survival ($P = 0.0384$ and $P = 0.0013$). For aerodigestive SCCs African Americans had a worse survival but there were no statistical differences by gender ($P < .0001$ and $P = 0.6984$). **Conclusions:** Disparities in head and neck cancer outcomes exist relative to race and gender within an integrated health system. It is unclear why African Americans with salivary malignancies have a survival advantage but worse survival in other tumor types. Further study and analysis is required to control for other factors such as socioeconomic status, education, smoking/alcohol use, comorbidities and treatment modality to answer these questions.

Keywords: Head and neck cancer; Squamous cell cancer

doi:10.3121/cmr.2014.1250.ps2-34

PS2-35:

Strategies Used by Rectal Cancer Survivors to Improve Bowel Function Other than Diet, Exercise, or Dietary Supplements

Mark Hornbrook¹; Debra Ritzwoller²; Paul Fishman³; Jennifer Lafata⁴; Maureen O'Keeffe-Rosetti¹; Ramzi Salloum⁴

¹Kaiser Permanente Northwest; ²Kaiser Permanente Colorado; ³Group Health Research Institute; ⁴Henry Ford Health System

Background/Aims: Rectal cancer (RC) surgery includes a colostomy (or ileostomy) or, more frequently, anastomosis of the rectum. Both surgery types may create long-term after-effects. We examined differences reported between survivors with ostomies (O) versus anastomoses (A) regarding bowel function and self-care. This analysis highlights patient-reported changes in daily routines that helped their bowel function, as revealed by responses to a question about post-surgical changes other than diet, exercise, or use of supplements "(such as timing of eating, number of meals, or other changes to your daily routines) that have helped with your bowel function?"

Methods: In 2010-2011, we mailed questionnaires to 1,063 long-term rectal cancer survivors (= 5 year's post-diagnosis) from two Kaiser Permanente (KP) Regions, Northern California (KPNC) and Northwest (KPNW), who had undergone a major intra-abdominal operation as part of their cancer treatment. Potential participants (KP members age 18 years or older with tissue-verified RC diagnoses) were identified through an electronic search of each site's computerized tumor registry. The overall response rate was 60.5% (577 respondents/953 eligible patients). **Results:** Survivorship ranged from 5 to 25 years. Mean age at time of survey was 72 years for anastomoses and 74 years for ostomies ($P < .03$). About 56% of patients with anastomoses were male compared to 66% of ostomates ($P < .03$). The most frequently mentioned strategies to help bowel function for both surgery types were: smaller meals (O = 26%, A = 33%; $n = 13/30$), regular time of meals (O = 26%, A = 9%; $n = 13/8$), and not eating dinner too late (O = 8%, A = 9%; $n = 4/8$). Patients with anastomoses mentioned the following additional strategies: grazing or multiple small meals/snacks (10%, $n = 9$), and not eating before activity (4%, $n = 4$). The most frequent bowel symptoms helped by these strategies were: predictability (52%, $n = 73$), gas (34%, $n = 48$), constipation (31%, $n = 43$), diarrhea (26%, $n = 37$), and bloating (23%, $n = 32$). **Conclusions:** Minimal differences were observed between ostomy/anastomosis survivors in bowel self-care strategies beyond diet, exercise, or use of supplements. Clinicians caring for RC survivors should be aware of these bowel self-management strategies both to offer as potential self-care practices and to understand whether these activities pose any risks to specific

patients, given their comorbidity burdens and other health practices.

Keywords: Rectal cancer; Bowel function

doi:10.3121/cmr.2014.1250.ps2-35

PS2-36:

Incremental Medical Care Costs of Prostate Cancer for Medicare Beneficiaries

Mark Hornbrook¹; Paul Fishman²; Debra Ritzwoller³; Jennifer Lafata⁴; Maureen O'Keeffe-Rosetti¹; Ramzi Salloum⁴; Jenny Staab¹; Erin Keast¹

¹Kaiser Permanente Northwest; ²Group Health Research Institute; ³Kaiser Permanente Colorado; ⁴Henry Ford Health System

Background/Aims: We estimated incremental monthly medical costs of prostate cancer (PC)—differences in monthly standardized costs between PC cases age = 65 and age-gender-health plan matched cancer-free controls—for SEER-Medicare and HMO Medicare beneficiaries across four 12-month phases of care—Pre-diagnosis, Treatment, Survivorship, End-of-Life—to understand whether type of health care arrangement—FFS indemnity vs. HMO capitation—was associated with differences in PC costs. **Methods:** Cases were SEER-Medicare and HMO patients aged = 65 years with PC (per tumor registry). Cancer-free controls were aged male Medicare indemnity beneficiaries and aged male HMO members who had no tumor registry evidence of any cancer prior to 2009. SEER-Medicare controls were a 5% random sample of aged Medicare beneficiaries. HMO controls were frequency matched to cancer cases on a 5:1 ratio by age group, gender, and having health plan eligibility during the year of the diagnosis from the matched prostate cancer case. We used a longitudinal case-control design to estimate incremental medical costs for PC cases starting 12 months prior to diagnosis. We extracted data for 2000-2008 from HMO standardized data warehouses and SEER-Medicare files. We applied Standardized Medicare reimbursement rates to utilization vectors and summed to total monthly medical expenses per patient in 2008 dollars. We analyzed monthly cost trajectories by phase of care and SEER-Medicare vs. HMO for Stages I-III vs. Stage IV vs. unknown Stage cases. **Results:** Monthly incremental PC costs in the pre-diagnosis phase were negative in the first 3 quarters and then rose rapidly in the quarter prior to diagnosis, with advanced-stage cases showing the steepest. FFS advanced-stage cases had the highest peak costs in the month of diagnosis, followed by HMO advanced stage cases. By the 12th month of the Treatment phase, monthly costs for all study groups converged at about \$500 per month. In the first survivorship year, FFA and HMO advanced-stage cases had higher incremental costs than the other study groups. In the last year of life, advanced-stage cases had higher incremental costs than all other groups. **Conclusions:** Stage-IV Medicare FFS PC cases received the most costly treatments of all study groups. FFS incremental costs were mostly higher than HMO costs.

Keywords: Prostate cancer; Cost

doi:10.3121/cmr.2014.1250.ps2-36

PS2-38:

Cancer Research Network: Cancer Incidence, Prevalence, and Health Plan Enrollment

Jessica Chubak¹; Rebecca Ziebell¹; Gene Hart¹; Robert Greenlee²; Stacey Honda³; Mark Hornbrook⁴; Lois Lamerato⁵; Kathleen Mazon⁶; Larissa Nekhlyudov⁷; Pamala Pawloski⁸; Debra Ritzwoller⁹; Virginia Quinn¹⁰; Azadeh Stark¹¹

¹Group Health Research Institute; ²Marshfield Clinic Research Foundation; ³Kaiser Permanente Hawaii; ⁴Kaiser Permanente Northwest; ⁵Henry Ford Health System; ⁶Meyers Primary Care Institute; ⁷Harvard Medical School; ⁸HealthPartners; ⁹Kaiser Permanente Colorado; ¹⁰Kaiser Permanente Southern California; ¹¹Geisinger Health System

Background/Aims: Nested within the HMO Research Network (HMORN), the Cancer Research Network (CRN) is a collaboration among the National Cancer Institute, 9 funded HMORN sites, 6 affiliate sites, and scientific collaborators from multiple institutions. Now in its fourth cycle, the CRN has been funded continuously since 1999. CRN's goals are to build data infrastructure, expertise, and collaborations to promote successful cancer research involving integrated healthcare delivery systems. Understanding

characteristics of incident and prevalent cancer cases in the CRN is essential for investigators to evaluate the feasibility of CRN research projects. **Methods:** Characteristics of health plan enrollees and prevalent (i.e., history of) and incident cancers were collected across the 9 funded CRN sites. Data were obtained from the CRN Cancer Counter – a tool to aggregate patient counts across sites from centralized summary data—as well as a centrally-developed SAS® program run against each site's Virtual Data Warehouse. Descriptive analyses focused on distributions of malignant cancer incidence and prevalence by age and anatomic site as well as by length of enrollment before and after diagnosis. **Results:** As of mid-2013, more than 9 million persons were enrolled in CRN site health plans. Of those enrollees, more than half a million were diagnosed with cancer during or before each site's last available year of cancer incidence data (2008-2011, varied by site). Prostate, breast, non-melanoma skin, and colon cancers had the highest prevalence and incidence. Overall, 22% of survivors were diagnosed prior to 1998. Examination of enrollees at one CRN site with a diagnosis of cancer in 2011 found that nearly half had been enrolled in the health plan for at least 15 years prior to diagnosis. Enrollment for cancer patients will be examined at additional CRN sites. **Conclusions:** The CRN is an excellent setting for prospective and retrospective studies of cancer etiology, screening, treatment and outcomes. Long periods of enrollment prior to cancer diagnosis facilitate retrospective studies of cancer etiology. Large numbers of cancer survivors with low disenrollment rates facilitate prospective observational studies and trials focused on cancer outcomes.

Keywords: Cancer Research Network; Epidemiology
doi:10.3121/cmr.2014.1250.ps2-38

PS2-39:

Depression and Its Relationship to Perceived Financial Burden among Long-term Rectal Cancer Survivors with Ostomies and Anastomoses

Yuda Chongpison¹; Mark Hornbrook²; Robin Harris¹; Marcia Grant³; Joanna Bulkley²; Christopher Wendel⁴; Lisa Herrinton⁵; Robert Krouse¹

¹University of Arizona; ²Kaiser Permanente Northwest; ³City of Hope National Medical Center; ⁴Southern Arizona Veterans Affairs Health Care System; ⁵Kaiser Permanente Northern California

Background/Aims: Consequences of surgery for rectal cancer (permanent ostomy (PO), anastomosis (AN), or temporary ostomy (TO) followed by anastomosis) can affect survivors' psychological and financial well-being. We investigated depression and its association with perceived financial burden resulting from their illness/treatment among long-term (≥ 5 years post-diagnosis) survivors. **Methods:** A mail survey of 574 long-term rectal cancer survivors from Kaiser Permanente Northern California and Northwest was conducted in 2010-2011. The survey included questions on current depression and perceived financial burden from the City of Hope Quality of Life questionnaire. Responses were indicated on a scale where 0 = 'none' and 10 = 'severe'. Scores ≥ 4 were classified as depressed and ≥ 5 as high financial burden. ANOVA was used to contrast mean scores among surgery types. Linear regression models evaluated depression and perceived financial burden scores with co-variables. **Results:** Mean current depression level was 2.09 (SD = 2.40), with 23% (134 of 574) classified as depressed. PO survivors (N = 182) had the highest current depression levels (M = 2.46, SD = 2.61) compared to AN (N = 326, M = 1.96, SD = 2.37) and TO (N = 66, M = 1.68, SD = 1.81) ($P = 0.02$). These differences in depression by surgery type were significant after adjusting for age, sex, and race ($P = 0.015$). Survivors reported average perceived financial burden of 1.94 (SD = 2.72), with 18% (103 of 572) perceiving high financial burdens. PO survivors perceived highest burden (M = 2.5, SD = 2.92) compared to AN (M = 1.60, SD = 2.57) and TO (M = 2.12, SD = 2.65) ($P = 0.001$). After confounding adjustment, level of perceived financial burden was positively associated with higher current depression levels ($P < 0.001$). Surgery type did not modify this relationship, but it was stronger among those also reporting depression after surgery ($P = 0.04$). **Conclusions:** Current depression was frequent among these long-term survivors of rectal cancer and was highest among those with permanent ostomy. While current depression and perceived financial burden due to their illness/treatment were statistically associated, there were no differences by surgery type. Research is needed to identify factors influencing high depression and financial pressures among these rectal cancer survivors. Clinicians should be aware that long-term survivors, particularly with permanent ostomy, can have depression and financial

burdens resulting from their illness or treatment. Encouraging these survivors to receive psychosocial services may improve their well-being.

Keywords: Long-term rectal cancer survivors; Depression
doi:10.3121/cmr.2014.1250.ps2-39

PS2-42:

All-cause Mortality is Decreased in Women Undergoing Annual Mammography Screening Before Breast Cancer Diagnosis

Rachel Stankowski¹; Jessica Engel²; Trista Stankowski-Drengler¹; Hong Liang¹; Adedayo Onitilo²

¹Marshfield Clinic Research Foundation; ²Marshfield Clinic

Background/Aims: Annual mammogram screening for the early detection of breast cancer in women is recommended by most professional organizations beginning at the age of 40. However, the efficacy of annual mammography screening related to decreasing mortality remains an area of debate due to concerns regarding risk versus benefit. The potential for harm as a result of over-diagnosis of cancers that may not have been clinically significant extends beyond the extensively analyzed breast cancer-specific mortality. Therefore, we sought to examine screening mammography frequency and all-cause mortality in breast cancer patients. **Methods:** Primary breast cancer cases diagnosed within the Marshfield Clinic system from 2002 through 2008 were identified for retrospective review. Patients diagnosed with breast cancer at another facility, male breast cancer patients, and patients residing outside of Wisconsin and its neighboring states were excluded. Patient demographics and additional data, including number of mammograms performed within five years prior to breast cancer diagnosis, breast cancer stage, insurance status, family history, and comorbidities, were abstracted. Kaplan-Meier curves were generated to assess the association between mammography screening in the five years prior to breast cancer diagnosis and overall survival with adjustment for age, insurance status, number of medical encounters, comorbidities, family history, and calendar year. **Results:** A total of 1,422 women with breast cancer were included in the analysis. After adjustment, women who missed any of their last five annual screening mammograms had a 2.3-fold increase in all-cause mortality compared to subjects who participated in annual screening mammography. When subjects were stratified by the number of missed screening mammograms in the five years prior to breast cancer diagnosis, a progressive decline in survival was noted resulting in an all-cause mortality hazard ratio of 1.3 (95% confidence interval 1.19 – 1.37, $P < 0.0001$) for each additional missed mammogram. **Conclusions:** These results suggest that annual mammography prior to breast cancer diagnosis is predictive of increased overall survival. Importantly, a stepwise decline in overall survival was noted for each additional missed mammogram. These results are similar to findings for breast cancer-specific mortality and illustrate the importance of recommending annual screening mammography to all eligible women.

Keywords: Breast cancer; Mammograms
doi:10.3121/cmr.2014.1250.ps2-42

Cardiovascular Disease

PS1-40:

Preventable Major Cardiovascular Events Due to Uncontrolled Glucose, Blood Pressure, and Lipids or Active Smoking in Adults With Diabetes With and Without Cardiovascular Disease

Gabriela Vazquez Benitez¹; Jay Desai¹; Emily Schroeder²; Gregory Nichols³; Jodi Segal⁴; Andy Karter⁵; John Steiner²; Katherine Newton⁶; Leo Morales⁵; Ram Pathak⁷; Patrick O'Connor¹

¹HealthPartners; ²Kaiser Permanente Colorado; ³Kaiser Permanente Northwest; ⁴Johns Hopkins University; ⁵Kaiser Permanente Northern California; ⁶Group Health Research Institute; ⁷Marshfield Clinic Research Foundation

Background/Aims: To analyze the incidence of major cardiovascular disease (CVD) hospitalization events and all-cause mortality among adults with diabetes with or without cardiovascular disease; and to estimate the proportion of preventable events due to uncontrolled lipids, glucose, blood pressure, and to active smoking. **Methods:** This was a retrospective cohort