biopsy often attended urology visits (38.6%, 4,992/ 12,935). PSA velocity was strongly associated with biopsy, for example, when PSA was below 4.0 ng/ml, a velocity =0.75ng/mL/year was associated with an 8.4 fold increase in biopsy. **Conclusions:** Biopsy practices following PSA testing have been stable over time in Group Health. As little is known about real-world biopsy patterns, these data should be helpful to other providers and patients who are uncertain about what is considered common practice in an HMO setting.

Keywords: PSA screening, Biopsy, Prostate cancer

doi:10.3121/cmr.2011.1020.ps2-43

C-B2-04:

Use of Health Plan Tumor Registry and EMR Data to Identify Cancer Recurrence and Progression

Debra Ritzwoller, PhD¹; Nikki Carroll, MS¹; Michael Hassett, MD²; Deborah Schrag, MD²; Nathan Tabeck, PhD²; Mark Hornbrook, PhD³; Jane Weeks, MD, MPH²

¹Kaiser Permanente Colorado; ²Dana Farber Cancer Institute; ³Kaiser Permanente NorthWest

Background: Reliable ascertainment of cancer recurrence is essential in order to evaluate therapeutic interventions to treat advanced disease. Specification of the timing of cancer recurrence using administrative claims from SEER-Medicare is challenging and has been limited to the use of algorithms based mainly on ICD9 diagnosis codes. **Aims:** We sought to identify scenarios or patterns of care that suggest cancer recurrence or progression using the detailed electronic medical record data contained in the HMO Cancer Research Network's (CRN) Virtual Data Warehouse (VDW). **Methods:** Using data from the Virtual Tumor Registry (VTR) from two HMO CRN health plans where the tumor registry staff conduct annual chart abstraction to ascertain recurrence, we identified incident cases of stage 1-3a breast, colorectal, lung, and prostate cancer for the years 2000-2003. The VTR data was linked to VDW pharmacy, procedure, and diagnosis data from the subject's incident cancer diagnosis date through the end of 2008. Descriptive analyses were performed. Scatter plots of events, including receipt of chemotherapy services, were created to determine "black out" periods associated with first course treatment and to identify other patterns of care consistent with recurrence or progression. **Results:** The proportion of incident cases with a noted recurrence during the observation period varied from 6.3% of prostate cancers to 19.1% of lung cancers. Fewer than 60% of cases (varied by cancer site) with a tumor registry-documented recurrence would have been identified as having a recurrence using an algorithm relying only ICD codes indicative of metastatic disease. Subjects with a noted recurrence had much higher use of advanced medical imaging (including CT, MRI and PET), laboratory procedures, and more pharmacy dispensings for narcotic analgesics. Scatter plots of chemotherapy services by month suggest that the interval of initial therapy among patients without recurrence varies by cancer type, so that algorithms for detecting recurrence based on these services need to be disease-specific. **Conclusions:** EMR data such as that available from the CRN VDW may be an optimal data source to be used to identify cancer recurrence. Next steps include the development of novel analytic strategies to estimate each patient's probability of cancer recurrence.

Keywords: Cancer, Recurrence, VDW

doi:10.3121/cmr.2011.1020.c-b2-04

C-A4-04:

The Delivery of Cancer and Other Preventive Health Services during Periodic Health Examinations

Deirdre Shires MPH, MSW¹; Ronak Vashi, BA¹; Kurt Stange, MD²; George Divine, PhD¹; Susan Flocke, PhD²; Tracy Wunderlich, MA¹; Jennifer Elston Lafata, PhD¹

¹Henry Ford Health System; ²Case Western Reserve University

Background/Aims: Limited time and competing demands force primary care physicians and patients to prioritize among evidence-based preventive

health services during periodic health examinations (PHE). We examined the rate of discussion of and recommendation for 19 USPSTF-endorsed preventive services during PHEs. **Methods:** Claims data, a pre-visit survey, and transcripts of audio-recorded office visits were used to identify which services patients were eligible and due for at the time of visit. Study physicians (N=60) are internal or family medicine physicians. Study patients (N=484) are insured, ages 50-80, and due for colorectal cancer screening at time of PHE. Audio-recordings of PHEs were evaluated for the frequency of preventive service discussions and physician recommendations - overall and by gender. **Results:** Patient participants are on average aged 59 years, 65% female and 66% white. Among patients eligible and due for service, smoking (100%, 54/54), breast cancer (94%, 67/71), and colorectal cancer screening (94%, 432/462) were most likely to be discussed, while aspirin use was the least likely to be discussed (28%, 31/109). Physicians were most likely to recommend colorectal cancer screening (93%, 429/462), blood pressure screening (90%, 92/102), and breast cancer screening (90%, 64/71) and least likely to counsel for aspirin use (18%, 20/109) and alcohol misuse (4%, 1/24). In our sample, males were more likely to receive recommendations for colorectal cancer (96%, 156/162 vs. 91%, 273/300), cholesterol (100%, 6/6 vs. 67%, 10/15), and hearing screening (36%, 18/50 vs. 25%, 13/52); pneumococcal vaccination (44%, 4/9 vs. 13%, 2/15); aspirin use (23%, 18/80 vs. 7%, 2/29); and alcohol misuse counseling (8%, 1/12 vs. 0%, 0/11) compared to females. Females in our sample were more likely to receive diet (38%, 65/170 vs. 23%, 29/125), weight (62%, 95/154 vs. 54%, 37/68), and tobacco cessation counseling (81%, 30/37 vs. 76%, 13/17). **Conclusions:** Although screening services are likely to be recommended to patients due for service, missed opportunities exist to counsel eligible patients for services aspirin use and alcohol misuse. These missed opportunities may vary by gender. We are currently exploring the patient, physician, visit and service characteristics associated with missed opportunities to deliver recommended preventive services during PHEs.

Keywords: Prevention, Screening, Primary care

doi:10.3121/cmr.2011.1020.c-a4-04

PS2-25:

Prostate Cancer Screening: Benefits, Barriers and Conflicting Information

Kathleen Mazon, EdD^{1,2,3}; Mark Mooradian, BS^{1,2,3}; Mary Costanza, MD²; Terry Field, DSC¹; Bridget Gaglio, PhD⁴; Sarah Greene, MPH⁵; Paul Han, MD⁶; Brandi Robinson, MPH⁷; Douglas Roblin, PhD⁷; Joann Wagner, MSW^{1,2,3}; Andrew Williams, PhD⁸

¹Meyers Primary Care Institute; ²UMass Medical School; ³Fallon Clinic, FCHP; ⁴Kaiser Permanente Colorado; ⁵Group Health Research Institute; ⁶Maine Medical Center; ⁷Kaiser Permanente Georgia; ⁸Kaiser Permanente Hawaii

Background: Prostate cancer screening is controversial; treatment of early stage cancer has uncertain benefits, and complications are likely. Physician-patient discussions about PSA testing may be brief or absent. We investigated men's familiarity and experiences with PSA testing, and perceived benefits and barriers. **Methods:** In the context of the multi-site CRN study "Health Literacy and Cancer Prevention" men aged 40-70 were interviewed about knowledge, attitudes and experiences related to PSA testing. Results: Of 437 men queried, 69% had heard of a PSA test, and 51% knew what type of cancer it tested for. 246 men had/intended PSA screening (PSA-accepters). The most common reasons cited for screening were physician recommendation (62%), age appropriateness (49%), and prostate-related symptoms (12%). 21 men had not been/did not intend to be tested (PSA-decliners); reasons included no physician recommendation (33%), age (19%), and no prostate issues (10%). Most men (83%) would find a normal result reassuring, and most (80%) believed a PSA test would reduce their chances of dying from prostate cancer; accepters held stronger beliefs about these benefits than decliners (p<.10). Overall, 24% would be nervous about what a PSA test might find and 13% agreed having a PSA test is unpleasant. The latter belief (but not the former) was stronger in PSA-decliners than accepters (p<.05). There were no statistically significant differences between PSA-accepters and decliners on health literacy test scores, however those who did not know

what sort of cancer a PSA test screened for scored lower than those who did ($p<.05$). Overall, 35% of men had read or been given conflicting information about PSA testing; these men were more likely to report mixed feelings about PSA testing, would be less likely to find a normal result reassuring, and were less likely to believe that PSA testing reduces chances of dying from prostate cancer ($p<.05$). **Conclusions:** Many men in this study were unfamiliar with PSA testing. Most believed that PSA testing would reduce their chances of dying from prostate cancer, and were not aware of conflicting information about PSA testing. Patient education about PSA testing is needed.

Keywords: Prostate cancer screening, Health beliefs, Health literacy
doi:10.3121/cmr.2011.1020.ps2-25

C-B2-05:

Screening Colonoscopy: Benefits, Barriers and Conflicting Information

Kathleen Mazor, EdD¹; Mark Mooradian, BS¹; Mary Costanza, MD²; Terry Field, DSC¹; Bridget Gaglio, PhD³; Sarah Greene, MPH⁴; Paul Han, MD⁵; Brandi Robinson, MPH⁶; Douglas Roblin, PhD⁶; Joann Wagner, MSW¹; Andrew Williams, PhD⁷

¹Meyers Primary Care Institute, UMass Medical School, Fallon Clinic, FCHP; ²University of Massachusetts Medical School; ³Kaiser Permanente Colorado; ⁴Group Health Research Institute; ⁵Maine Medical Center; ⁶Kaiser Permanente Georgia; ⁷Kaiser Permanente Hawaii

Background: Research suggests physician-patient discussions about colonoscopies may be brief or absent. We sought to investigate men and women's familiarity and experiences with colonoscopies, and perceived benefits and barriers. **Methods:** In the context of the multi-site CRN study "Health Literacy and Cancer Prevention" adults aged 40 to 70 were interviewed about knowledge, attitudes and experiences related to colonoscopy screening. **Results:** Of 1068 adults queried, 99% had heard of a colonoscopy, and 90% knew what type of cancer it tested for. 976 men and women had or intended to have a colonoscopy (accepters). The most common reasons cited for a colonoscopy were age appropriateness (59%), physician advice (56%), family history (16%), and colon-related symptoms (14%). 69 men and women had not had and did not intend to be tested (decliners). These participants cited lack of doctor recommendation (39%), age (16%), absence of family history (15%) and absence of colon-related issues (15%) as reasons. Most participants (92%) would find a normal result reassuring, and most (80%) believed having a colonoscopy would reduce their chances of dying from colon cancer. Overall, 41% would be nervous about what a colonoscopy might find and 69% agreed that having a colonoscopy is unpleasant. A statistically significant difference between accepters and decliners was found only on the latter belief, with 68% of decliners endorsing that a colonoscopy is unpleasant, compared to 82% of accepters ($p<.05$). There were no statistically significant differences between accepters and decliners on health literacy test scores, however those who did not know what sort of cancer a colonoscopy screened for scored lower than those who did ($p<.05$). Overall, 14% of participants had read or been given conflicting information about a colonoscopy; those who had were more likely to report mixed feelings about having a colonoscopy ($p<.05$). **Conclusions:** Almost all participants in this study were familiar with colonoscopy screening, and a large majority knew what type of cancer it screened for. While many participants were aware of age as a factor in screening appropriateness, not surprisingly physicians' advice (or its absence) also appeared to be influential.

Keywords: Colon cancer screening, Health beliefs, Health literacy
doi:10.3121/cmr.2011.1020.c-b2-05

C-B2-01:

Cardiotoxic Chemotherapy is Associated with Increased Heart Failure Risk Among Women with Breast Cancer in the Cancer Research Network

Erin Aiello Bowles, MPH¹; Robert Wellman, MS¹; Thomas Delate, PhD²; Larry Allen, MD³; Heather Spencer Feigelson, PhD²; Marianne Ulcickas Yood, PhD⁴; Robert Davis, MD⁵; Larissa Nekhlyudov, MD⁶; Catherine McCarty, PhD⁷; Laurel Habel, PhD⁸; David Magid, MD²; Adedayo Onitilo, MD⁷; Andrew Freedman, PhD⁹; Edward Wagner, MD¹

¹Group Health Research Institute; ²Kaiser Permanente Colorado; ³University of Colorado, Denver; ⁴Henry Ford Health System; ⁵Kaiser Permanente Georgia; ⁶Harvard Pilgrim Health Care Institute; ⁷Marshfield Clinic; ⁸Kaiser Permanente Northern California; ⁹National Cancer Institute

Background: The association between cardiotoxic chemotherapy for breast cancer treatment and congestive heart failure has been well documented in clinical trials. However, clinical trial populations often contain young, otherwise healthy people, and these results may not represent true associations in community settings. We used electronic administrative data from the CRN VDW to estimate the association between chemotherapy with anthracycline and/or trastuzumab and heart failure in a cohort of women with breast cancer. **Methods:** We included 13,497 women diagnosed with invasive breast cancer between 1999-2007 from eight CRN health plans. Using Current Procedural Terminology codes and National Drug Codes from the VDW, we determined whether each woman was exposed to anthracyclines alone, trastuzumab alone, anthracyclines plus trastuzumab, other chemotherapy, or no chemotherapy. We used International Classification of Disease codes and an algorithm based on number of inpatient, outpatient, and emergency department diagnoses to determine whether each woman had a prevalent (before breast cancer diagnosis) or incident (after breast cancer diagnosis) heart failure diagnosis. Using Cox proportional hazards models, we modeled the time to incident heart failure (censoring at disenrollment or death) associated with time varying exposures for each treatment category using hazard ratios (HR) and 95% confidence intervals (CI) adjusted for age, health plan, stage, year of diagnosis, and comorbidities. **Results:** Almost half of our study population received no chemotherapy (46.2%, 6420/13497); 28.6% (3857/13497) received anthracyclines alone, 1.2% (157/13497) received trastuzumab alone, 3.5% (470/13497) received both, and 20.4% (2748/13497) received other chemotherapy. One thousand forty-one women (7.7%, 1041/13497) were diagnosed with incident heart failure. The adjusted HR associated with anthracycline use alone was 1.19 (95%CI=0.97-1.46) compared with no chemotherapy, 3.02 for trastuzumab alone (95%CI=1.86-4.89), 6.05 for anthracycline and trastuzumab combined (95%CI=4.35-8.42), and 1.36 for other chemotherapy (95%CI=1.17-1.58). These associations strengthened after excluding women with prevalent heart failure or incident heart failure diagnosed <60 days after breast cancer diagnosis. **Conclusions:** Cardiotoxic outcomes after chemotherapy occur in the community setting; the combination of anthracycline plus trastuzumab in particular, is associated with an elevated heart failure risk. The CRN is an ideal setting to study chemotherapy, cardiotoxicity, and other survivorship-related outcomes.

Keywords: Breast cancer, Chemotherapy, Congestive heart failure
doi:10.3121/cmr.2011.1020.c-b2-01

C-B2-03:

10-Year Safety of Radiotherapy Among Older Breast Cancer Survivors

Reina Haque, PhD¹; Marianne Ulcickas Yood, PhD²; Aruna Kamineni, PhD³; Chantal Avila, MA¹; Jiaxiao Shi, PhD¹; Rebecca Silliman, MD, PhD⁴; Virginia Quinn, PhD¹

¹Kaiser Permanente Southern California; ²Henry Ford Health System; ³Group Health Research Institute; ⁴Boston University Medical Center

Background: Almost 75% of breast cancer patients worldwide are treated with adjuvant therapy, primarily radiotherapy (RT). However, little is known about the long-term effects on cardiovascular health, particularly in older women. **Aims:** We studied nearly 800 women aged 65 years or older with early-stage breast cancer who received care through integrated health care plans to determine if cardiovascular disease (CVD) is associated with radiotherapy. **Methods: Design & Data Elements:** The retrospective cohort study, Breast Cancer Treatment in Older Women (BOW), included 806 women aged 65+ years diagnosed with stage I-II breast cancer between 1990 & 1994. These women were treated with surgery (breast conserving surgery [BCS] or mastectomy) and followed through 12/31/2004. **Exclusions:** Participants with CVD disease at baseline; those who had chemotherapy; or underwent BCS only without radiation treatment (i.e., less than standard care). **Data elements:** Demographic, treatment, tumor and comorbidity data from medical records, automated membership databases & SEER-affiliated