Clinical Medicine & Research
Volume 8, Number 3/4: 179-209

clinmedres.org

Selected Abstracts from the 16th Annual HMO Research Network Conference, March 21-24, 2010, Austin, Texas

Health and Wellness

C-A1-01:

Changes in Physical Activity and Nutrition in a Behavioral Intervention Pilot Study - Passport to Brain Wellness

Leah R Hanson, PhD[1,2]; Brian C Martinson, PhD[1]; Nancy E Sherwood, PhD[1,3]; A Lauren Crain, PhD[1]; Marcia G Hayes, MPH, RD[1]; Patrick J O'Connor, MD, MPH[1]; Rachel B Matthews, BA[2]; Jacob M Cooner, BA[2]

[1]HealthPartners Research Foundation, Minneapolis, MN; [2]Regions Hospital, Alzheimer's Research Center Saint Paul, MN; [3]University of Minnesota, Division of Epidemiology and Community Health, Minneapolis, MN

Background/Aims: Increasing concerns about cognitive decline and dementia in the aging populations of most westernized countries suggests the need for interventions that can preserve cognitive function, are cost-effective, and feasibly implemented on a large scale. Empirical evidence is accumulating that points to the potential beneficial effects of cardiovascular fitness, healthy diet, social integration and participation in cognitively stimulating activities in the maintenance of cognitive function. We have developed and pilot tested "Passport," a multi-component, cognitive-behavioral, phone and mail based intervention to promote such lifestyle changes in older adults. **Methods:** Cognitively intact (TICS ≥ 31), sedentary (<90 min physical activity[PA] per week) adults aged 61-80 years were recruited from among HealthPartners' members. Baseline assessments included cognitive function, biomarkers, lifestyle factors, and physical traits. In the first phase, 21 participants were recruited and all assigned (non-randomized) to receive a course book, pedometer, tool kit and 7 bi-weekly phone coaching calls. In the second phase, 42 participants were recruited and randomized to either the Guided Intervention (n=22) or a Self-Directed (n=20) group, who received the study materials but no coaching. We completed 6 month follow-up measures with 58 (92%) subjects, and report here on their PA and nutritional outcomes. **Results:** The 63 enrolled subjects were female (60%), 70 years old, highly educated (73% college or more), predominantly retired (81%), non-Hispanic White (71%;) and married (65%). On average, they were overweight, BMI M=29.8, normotensive, systolic BP M=122.8, and normocholesterolemic, total serum cholesterol M=189.3. Mixed-model analyses indicated a time*treatment group effect on objectively monitored MVPA ($p<.05$), with a significant increase in the guided group (7.3 to 16.5mins/day, $p<.05$). We observed a significant effect of time on saturated fat intake ($p<.05$), with a significant pre-post reduction among Guided participants (26.1 to 23.4 grams, $p<.05$). Similar patterns of effects were observed for intake of fruits, vegetables and dietary fiber. Finally, we observed a time effect on intake of fish high in omega-3 fatty acids, driven by an increase in the non-randomized group ($p<.05$). **Conclusions:** Passport shows promise for improving aspects of lifestyle behaviors hypothesized to be important for the primary prevention of cognitive decline in older adults.

Keywords: Intervention Studies, Physical activity behavioral research, Lifestyle behaviors

doi:10.3121/cmr.2010.943.c-a1-01

C-A1-02:

Evaluating Kaiser Permanente Georgia's Worksite Wellness Programs in the Atlanta Area

Douglas Roblin, PhD[1]; Brandi Robinson, MPH[1]; Staycee Benjamin-Stone, MA, CHES[1]

[1]Kaiser Permanente Georgia

Background/Aims: There are few prospective evaluations of the effectiveness of worksite wellness programs in achieving improved lifestyle and health. Our study has two objectives: 1) to assess the cross-sectional associations of biometric status, lifestyle, and health obtained at a wellness program's enrollment session, and 2) to assess changes in biometric status, lifestyle, and health between the enrollment and 6-month disenrollment sessions. **Methods:** For this prospective cohort study, participants were recruited from Kaiser Permanente Georgia (KPG) subscribers who were employed at a mid-sized private employer group. Participants completed a biometric assessment and written survey. The biometric measures included height, weight, blood pressure, hip/waist ratio, and total cholesterol. The written survey included measures of: health (SF-12), patient activation (PAM-13), leisure physical activity (BRFSS), food screeners (Block), and work presenteeism (SPS-6) and absenteeism. Over the next 6 months, participants will attend seminars on exercise, weight loss, and healthy cooking and eating. The biometric assessment and survey be repeated in February 2010. **Results:** Of the 63 eligible KPG subscribers, 60 (41 females and 19 males) consented to participate. Participant ages ranged from 28-77 years. Overall, physical and emotional health, activation, leisure physical activity, dietary intake, and BMI were comparable to results obtained among relatively healthy, low risk working age adults in a 2005 survey of KPG subscribers in large group employers. Total cholesterol was significantly ($p<0.05$), positively associated with percent fat in diet; and, percent fat in diet was significantly, inversely associated with activation. Participants with 1 or more days absent from work in the most recent 4-week period reported significantly higher total cholesterol and percent fat in diet and significantly lower activation. Participants with high levels of presenteeism were significantly less likely to report leisure physical activity at the recommended level. **Conclusions:** The initial results indicate that improving levels of activation (improved self-efficacy, motivation to pursue a healthy lifestyle and adhere to recommended care) might improve dietary intake (thereby reducing fat intake and cholesterol levels) and decrease BMI. The final wellness program evaluation will indicate how much change in these measures might occur in a relatively healthy group of working age adults.

Keywords: Worksite wellness program, Lifestyle, Improved health and wellness

doi:10.3121/cmr.2010.943.c-a1-02

C-B1-02:

Strategies Used by Physicians to Treat Hypertension

William Rush, PhD[1]; Patrick O'Connor, MD, MPH[1]; JoAnn Sperl-Hillen, MD[1]; Heidi Ekstrom, MA[1]

[1]HealthPartners Research Foundation

Background and Aims: There is high variation in the way hypertension is managed by primary care physicians (PCP's). The aim of this study was to evaluate correlations between the frequency of different treatment strategies and overall achievement of blood pressure goals. **Methods:** We reviewed 280,423 encounters with 127 HealthPartners PCP's totaling 57,101 patients with hypertension. Encounters occurred from 1/2/07 to 5/29//09. For each encounter, data included blood pressure, blood pressure drugs in the classes ACE, ARB, Diuretic, Beta Blocker, Alpha Blocker and Calcium Channel Blocker, and the presence of the co-morbid conditions of diabetes, chronic kidney disease (CKD) and heart disease. The dependent variable was the proportion of a physician's encounters with blood pressure at goal. Independent variables included start of a new BP medication, increased dose of a pre-existing BP medication, visit interval (time to next encounter), and comorbid conditions. Patients were considered at goal if both the diastolic and systolic blood pressure met the recommended criteria. **Results:** Of the encounters, 31% were not at goal. Of these patient with encounters not at goal, 15.5% were started on a new class of BP medication and a higher use of this strategy correlated with a higher overall proportion of encounters at BP goal (r=.51; p<0.0001). At 14.9% of the encounters there was an upward adjustment of the dosage of a medication and a use of this strategy also correlated with overall proportion of patient encounters with BP at goal (r=.43; p<0.0001). The average encounter interval was significant (r=.21; p=0.0215) only for patients with stage 2 hypertension. The comorbid conditions of diabetes (r=.38; p<0.0001) and kidney disease (r=.21; p=0.0171 were both related to less success at achieving BP goals. **Conclusions:** Physicians who were more likely to start new classes of medications or upwardly titrate BP drugs at encounters had a higher proportion of their patient encounters at recommended blood pressure goals. Shorter visit interval was also beneficial in patients with stage 2 hypertension (greater than 20/10 over goal). Not surprisingly, physicians had more difficulty achieving blood pressure goals in patients with diabetes and kidney disease.

Keywords: Hypertension, Blood pressure study, Treatment strategies

doi:10.3121/cmr.2010.943.c-b1-02

C-B1-03:

The Association of Optimal Lifestyle Adherence with Emotional Health Indicators Among Active Employees

Thomas Kottke, MD, MSPH[1]; Nico Pronk, PhD[1]

[1]HealthPartners Research Foundation

Background and Aims: Adherence to an optimal lifestyle defined as adequate physical activity (=150 minutes per week), no use of tobacco, moderate alcohol use (=1 drink/d for women or =2 drinks/d for men), and eating five servings of fruits and vegetables per day has been associated with as much as 14 years of increased longevity and improved functional health status. Unfortunately, adherence to these four behaviors is relatively low in the United States. Furthermore, it is unclear the extent to which adherence to these health behaviors among working adults is associated with emotional health indicators such as self-reported stress, depression, depression risk, overall emotional health, and self-perceived general health. Improved understanding of this impact may hold significant potential for population health improvement strategies implemented via the worksite. The purpose of this investigation was to define the association of varying levels of self-reported optimal lifestyle with self-reported emotional health risks. **Methods:** All data were self-reported and collected as part of a health assessment process implemented through employer-sponsored programs during the year 2007. The number of subjects (N total=28,897) reporting from zero to 4 behaviors were 77; 1,294; 8,162; 15,085; and, 4,279 respectively. Emotional health variables included self-reported stress concerns, depression, depression risk based on personal history of depression, emotional health concerns, and self-perceived general health status. **Results:** The ratio of the percentage of the population with a positive response if no optimal lifestyles are practiced/ the percentage of the population with a positive response if 4 optimal lifestyles are practiced is 3.8 for stress concerns, 1.9 for depression, 14.2 for high risk for depression, 5.3 for emotional health concerns and 5.6 for self-perceived poor general health status. **Conclusions:** Adherence to an optimal lifestyle is associated with lower rates of self-reported stress, depression, and poor perceived health status. The relationship is most likely bi-directional. If it is, enhanced focus and attention to population-based strategies that improve adherence to these four behaviors may positively affect a variety of emotional health outcomes, and addressing issues of emotional health may help individuals adhere to healthy lifestyles.

Keywords: Optimal Lifestyle, Emotional health, Healthy lifestyle

doi:10.3121/cmr.2010.943.c-b1-03

PS2-24:

Improving Breast Cancer Surgery Quality Through a Collaborative Surgical Database

Heather Feigelson, PhD, MPH[1]; Kimberly Bischoff, MSHA[1]; Erin Bowles, MPH[2]; Jessica Engel, MSN[3]; Ted James, MD[4]; Adedayo Onitilo, MD[3]; Richard Single, PhD[4]; Andrew Williams, PhD[1]; Edward Wagner, MD, MPH[5]; Laurence McCahill, MD[6]

[1]Kaiser Permanente; [2]Group Health Research Institute; [3]Marshfield Clinic; [4]University of Vermont; [5]Group Health; [6]Van Andel Research Institute

Background and Aims: Breast cancer surgery is the most common cancer operation in the United States. While well established clinical trials performed more than 20 years ago have clearly established the equivalency of partial mastectomy and mastectomy regarding the endpoint of overall survival for breast cancer, controversies in the surgical management of breast cancer remain. Few guidelines exist regarding performance metrics and quality outcomes specific to breast cancer surgery. In order to identify more meaningful breast cancer surgery quality measures, the Vermont Breast Cancer Surgery Outcomes (VBCSO) database was initiated at the University of Vermont in 2003 and has been maintained continuously and successfully tracked outcomes of initial surgical treatment for over 1000 incident breast cancers. The database was specifically designed to assess measures of quality for a low risk cancer surgery that might impact patient treatment decisions, requirements for additional surgery, and perhaps ultimately cancer recurrence. We have recently been funded to expand this database to three CRN sites to evaluate surgical outcomes from a larger number of surgeons, hospitals and geographic regions. **Methods:** We will create a database of all women diagnosed with a primary breast cancer undergoing breast cancer surgery between 2003-2008 at three CRN sites (Kaiser Permanente Colorado, Group Health Cooperative, and Marshfield Clinic) using the Virtual Data Warehouse and medical record review. This database will be combined with the existing VBCSO database to evaluate potential measures of surgical quality. **Results:** To demonstrate the value of establishing this multicenter database, and the potential impact it could have on the quality of surgical treatment provided to breast cancer patients, the data will be analyzed initially to identify sources of (1) variation in mastectomy rate, (2) variation in initial partial mastectomy positive margin rates, and (3) variation in re-excision rates following initial partial mastectomy. **Conclusion:** An electronic clinical network that has detailed data on breast cancer diagnoses, surgical procedures, and surgical outcomes will allow for several comparative effectiveness research hypotheses to be tested. The development of data protocols and data capture tools as part of this proposal will facilitate participation by a larger network of hospitals in the future.

Keywords: Breast cancer surgery, Breast cancer database, Quality measure outcomes

doi:10.3121/cmr.2010.943.ps2-24

PS2-26:

Recruitment Costs for a Multi-Center, Randomized Clinical Trial for a Behavioral Intervention Study

Sarah Beaton, PhD[1]; JoAnn Sperl-Hillen, MD[2]; Ann Von Worley, BS, RN[1]; Omar Fernandes, MPH[2]; Dorothy Baumer, MS[1]; Herbert Davis, PhD[1]

[1]LCF Research; [2]HealthPartners Research Foundation

Background and Aims: The pace of recruitment impacts resources, planned study tasks, timelines, and ultimately, costs. The Journey for Control of Diabetes: the IDEA Study, a randomized trial conducted in two healthcare settings (Minnesota and New Mexico) utilized different recruitment methods at each site. This presentation compares these recruitment methods with respect to recruitment efficiency and costs. **Methods:** Study inclusion criteria were patients with sub-optimally controlled type 2 diabetes, an A1c=>7, and diabetes education-naïve within the last one to two years. Recruitment databases at each site were developed using electronic health data to identify potential participants. All patients were mailed recruitment letters and study brochures inviting them to participate. Site 1 mailed letters with an enclosed response form for the patient, if interested, to return to the study site; Site 2 mailed letters and subsequently attempted to contact all patients by telephone. Six months into the recruitment period, Site 1 also incorporated follow-up calls to potential patients who were mailed recruitment letters. **Results:** The enrolled sample was 623 patients: 147 (Site 1, Method 1), 190 (Site 1, Method 2), and 286 (Site 2). Recruitment efficiency rates based on number of enrolled participants per total recruitment letters mailed were 3.8% (147/3995 for Site 1, Method 1), 3.7% (190/5199 for Site 1, Method 2), and 6.9% (286/4128 for Site 2, Method 3). Cost of enrollment per patient ranged from $71.45 for Method 1 ($10,502/147), $81.90 for Method 2 ($15562/190), and $87.57 for Method 3 ($25,046/286). Total staff hours per patient were 1.58 for Method 1 (232.3/147), 2.51 for Method 2 (477.5/190), and 3.46 for Method 3 (990.4/286). Site 1, when combining data for Methods 1 and 2, recruited more subjects (337) within the 11 month recruitment period than Site 2 (286). **Conclusions:** Although recruitment efficiency rates were higher for Site 2, fewer staff hours were used at Site 1. Using the Site 2 methodology of contacting each patient may be more effective for studies with a higher risk of participation. Future studies should consider including a recruitment response form with the recruitment letter to save time and cost.

Keywords: Recruitment methods, Patient participation, Behavioral intervention

doi:10.3121/cmr.2010.943.ps2-26

PS2-27:

Lifestyle Choice, Education and Risk of Dementia Among Older Americans

Rashmita Basu, PhD; Washington State University

Background: The United States is in the midst of a profound demographic change: the rapid aging of its population. Dementia is one of the most common diseases at this age cohort. The cause of dementia is unknown and there is no effective treatment. Identification of lifestyle related factors that influence the risk of developing dementia, however, may provide insight into its cause and offer potential strategies for prevention. **Aim:** The primary objective of this study is to examine the association between a set of lifestyle characteristics and the likelihood of dementia among older Americans. **Methods:** The Aging Demographics and Memory Study (ADAMS) dataset is used to examine a set of potential protective or risk factors for dementia among older individuals in the U.S. The ADAMS is a cross-sectional data of a stratified random sample of 1,770 individuals of age 70 and above, selected from the Health and Retirement Survey -2000, based on the self-or-proxy reported cognition score. The ADAMS is the first nationally representative sample of individuals with dementia in this country. The generalized ordered logistic model is used to examine the impact of lifestyle related risk factors on the likelihood of dementia and other cognitive impairments not dementia (CIND). **Results:** For one year increase in age the odds of dementia versus the combined outcomes of CIND and normal increases by 1.11. Compared to all other genotypes, APOE-e4 is associated with an increased risk of dementia. An each year increase in education, the odds of dementia against the combined outcomes of CIND and normal is decreased by 0.90. Among chronic health conditions, an incidence of stroke is the significant risk factor for dementia. **Conclusion:** The finding that higher education lowers the risk of dementia has important implications as education can be viewed as a 'preventive medicine' for postponing the onset of dementia. From a policy perspective the causal relationship is important in order to evaluate the effectiveness of public expenditures on education. Further research can investigate whether a re-allocation of resources can be welfare improving if the impact of education on dementia risk is larger than the impact of healthcare on dementia.

Keywords: Dementia, Lifestyle factors, Education levels

doi:10.3121/cmr.2010.943.ps2-27

PS2-28:

Online Consenting in the Simulated Diabetes Training (SDT) for Resident Physicians Study

Omar Fernandes, MPH; HealthPartners

Background and Aims: The main purpose of this NIDDK-funded group-randomized trial is to evaluate the effect of teaching resident physicians fundamental principles of diabetes management using an interactive computer simulation program called SimCare. A minimum of 20 primary care residency programs with up to 700 residents total will be randomly assigned to either (a) an early SimCare Diabetes learning program group or (b) a delayed SimCare Diabetes learning program group. This presentation will provide an explanation of and justification for using an online informed consent process to facilitate informed consent for a national trial of this scale. **Methods:** Resident physicians interested in participating in this study will be asked to read an online informed consent form that fully details the study procedures, potential risks and benefits to participating, the study's voluntary nature, and issues surrounding confidentiality. As they move through each page of the online consent form, they will be required to confirm their understanding of the page's content by clicking an "I understand" check box before they can proceed. Reviewing the online consent and enrolling in this study confers their informed consent. **Results:** The online informed consent process for this study has been developed and IRB-approved. To enroll, a resident will create a user name and password and provide contact information to be used to communicate with them during the study. A link to the principal study staffs' contact information will also be clearly posted on each page so that if a resident has a question or concern, they can contact the study staff prior to completing the form. At the end of the form, a resident has the choice to agree to participate and enroll in the study and print a copy of the consent, ask questions to the study staff prior to consenting, or decide not to participate. **Conclusions:** It is difficult to coordinate informed consent for a national trial, but an online informed consenting process such as this provides an efficient avenue that meets internal review board standards.

Keywords: Online consenting process, informed consent, national trial enrollment

doi:10.3121/cmr.2010.943.ps2-28

PS2-29:

Optimal Lifestyle Adherence and 2-Year Incidence of Chronic Conditions

Thomas Kottke, MD, MSPH[1]; Nico Pronk, PhD[2]

[1]HealthPartners Research Foundation; [2]HealthPartners

Background and Aims: Adherence to an optimal lifestyle, defined as adequate physical activity, no use of tobacco, moderate alcohol use, and eating five servings of fruits and vegetables per day, has been associated with as much as 14 years of increased longevity and improved functional health status. Unfortunately, adherence to these optimal lifestyle behaviors is relatively low among the population. Furthermore, the extent to which adherence to multiple lifestyle behaviors is associated with specific disease

incidence is unclear. Improved understanding of this association may hold significant potential for population health improvement strategies. The purpose of this investigation was to study the association of adherence to varying levels of an optimal lifestyle with the incidence of chronic disease among employed adults (N=35,684). **Methods:** All baseline data were collected as part of a health assessment process during the year 2007. Participants were followed for two years. Descriptive statistics were calculated and reported as the proportion of the sample reporting a newly diagnosed chronic disease (diabetes, heart disease, hyperlipidemia, hypertension, back pain, or cancer) by the number of lifestyle behaviors that they practiced. **Results:** Compared with individuals who practiced no or only 1 optimal lifestyle behavior, the risk of developing a condition for individuals practicing 3 or 4 behaviors was 66% lower for diabetes, 45% lower for heart disease, 17% lower for hyperlipidemia, 15% lower for hypertension, 43% lower for back pain, and 24% lower for cancer. **Conclusions:** Adherence to optimal lifestyle is associated with lower 2-year incidence rates of several chronic conditions. Attention to population-based strategies that improve adherence to these four behaviors appears to positively affect risk of chronic diseases and their risk factors. To the extent that social marketing strategies and systematic measurement and feedback to individual members, patients, and groups (e.g., employer-based) increases adherence to multiple health behaviors, risk of chronic disease may be reduced.

Keywords: Optimal lifestyle adherence, Lifestyle behaviors, Health improvement strategies

doi:10.3121/cmr.2010.943.ps2-29

IRB Issues

C-A2-01:

IRB Review in the Era of ARRA: Streamlining Without Sacrifice

Jeffrey Braff, DrPH, MBA[1]; Sarah Greene, MPH[2]; Karin Johnson, PhD[2]; Ella Thompson, BS[2]; Kate Rardin-Leahy, PhD[3]

[1]Kaiser Permanente; [2]Group Health Cooperative; [3]Health Partners

Background and Aims: In the era of ARRA, we are routinely confronted with compressed timelines and an accelerated pace of research. Concurrently, discussions have intensified over recent months about the HMORN's capacity to conduct comparative effectiveness research on topics of national interest. Building on these unique challenges and opportunities, this interactive session will serve as a forum for conference attendees to discuss recent HMORN efforts to make multi-site IRB review as agile as possible. In particular, we will showcase the HMORN facilitated review process and discuss how it might be further improved or expanded. **Methods:** In early 2008, the HMORN ratified its first Standard Operating Procedure (SOP), which outlines procedures for inter-institutional IRB review of data-only studies. This SOP helped clarify what steps to take and who to contact, both in order to pursue ceding, and when multiple IRBs need to review the same study. This process has now been used in a majority of HMORN member institutions. As its use has increased, researchers and IRB administrators have become more familiar with the process. In September 2009, the HMORN Governing Board identified continuing such work to ensure IRB agility as a key 2010 priority for the HMORN. **Results:** In this session, we will review how to use the facilitated IRB review process outlined in the SOP and learn from attendees how we can further facilitate multi-site IRB review, along with attendant concerns such as HIPAA. In addition, we will give a snapshot of recent and upcoming developments across the Network sites, including human research protection program accreditation efforts and migration to electronic IRB systems. **Conclusions:** This session will enable research investigators, IRB administrators and HMORN leadership to engage in a constructive dialogue about the residual barriers to using the facilitated IRB process for data-only studies, and identify pathways to institutionalize this process in our Network's routine research processes. This session will also introduce how the demands of IRB accreditation and the implementation of new electronic IRB systems may facilitate or impede our progress in this area.

Keywords: IRB review, HMORN, Multicenter Studies

doi:10.3121/cmr.2010.943.c-a2-01

Health and Bioinformatics

C-A4-01:

Providing Care for Cancer Survivors in Integrated Delivery Systems: An Assessment of Current Practices and Future Opportunities

Jessica Chubak, PhD[1]; Clarissa Hsu, PhD[2]; Leah Tuzzio, MPH[1]; Beth Kirlin, BA[1]; Larissa Nekhlyudov, MD, MPH[3,4]

[1]Group Health; [2]Group Health Research Institute; [3]Harvard Medical School; [4]Harvard Vanguard Medical Associates

Background and Aims: There are currently more than 11 million cancer survivors in the United States; for many, cancer is a chronic condition that requires effective management and coordination of care. Little research on cancer survivorship models has been done, and most has focused on care provided in cancer centers. To our knowledge, no research has been conducted within population-based integrated delivery systems. To this end, the Cancer Research Network (CRN) Survivorship Scientific Interest Group (SIG) undertook a project to identify and describe; 1) current practices in cancer survivorship care, 2) goals and/or intentions to create cancer survivorship care programs, and 3) areas for future research in survivorship care models within integrated delivery systems. **Methods:** Semi-structured interviews were conducted with expert informants from 10 of 14 CRN sites. Individuals were selected based on their leadership roles in primary care/internal medicine, oncology, nursing and/or other cancer-related specialties. Interviews were conducted by telephone and were audiotaped, transcribed and coded. Analyses are underway; final results will be available at the HMORN meeting. **Results:** Of the initial 48 persons contacted, interviews were completed with 40 expert informants. Preliminary analyses suggest that in general respondents were supportive of providing cancer survivors with medical services customized to the needs of cancer survivors. At most sites, follow-up care for cancer survivors was provided by an informal collaboration between primary care physicians and oncologists. Respondents reported that the electronic medical records available at their sites appear to facilitate communication between providers caring for cancer survivors. Challenges in providing care to cancer survivors included allocation of time and resources. Few sites have survivorship care-specific guidelines, care plans or other formal tools to assist physicians in creating follow-up care plans for cancer survivors. The interviews identified 2 formal survivorship programs underway and one being pilot tested. **Conclusions:** While there appears to be an awareness of the needs of cancer survivors by the leadership in the integrated health care delivery sites, survivorship programs are generally not formalized. This study enhances our understanding of community-based cancer survivorship care and helps build the foundation for research on the effectiveness of different approaches to improve care.

Keywords: Cancer survivorship, survivorship models, integrated health delivery

doi:10.3121/cmr.2010.943.c-a4-01

C-B5-02:

H1N1 Vaccine Safety Monitoring in the Vaccine Safety Datalink Project: New Challenges and Useful Lessons

Tracy Lieu, MD, MPH[1]; Sharon Greene, PhD, MPH[1]; Ruihua Yin, MS[1]; Rong Li, MS[1]; Martin Kulldorff, PhD[1]; Eric Weintraub, MPH[2]; Bruce Fireman, MA[3]; Roger Baxter, MD[3]; James Nordin, MD, MPH[4]; Steven Jacobsen, MD, PhD[5]; Edwin Lewis, MPH[3]; James Baggs, PhD[2]; Melisa Rett, MPH[1]; Richard Platt, MD, MS[1]; Grace Lee, MD, MPH[1]

[1]Harvard Pilgrim Health Care Institute and Harvard Medical School; [2]Centers for Disease Control and Prevention; [3]Kaiser Permanente Vaccine Study Center, Northern California; [4]HealthPartners Research Foundation; [5]Kaiser Permanente Southern California

Background and Aims: The worldwide introduction of influenza A (H1N1) vaccines in fall 2009 has raised widespread public questions about the safety of these new vaccines. The Vaccine Safety Datalink Project, a collaboration among CDC and eight health care systems in the HMORN, began accelerated

monitoring of this vaccine's safety in early fall 2009. **Methods:** The VSD Project conducts near real-time monitoring of potential adverse events following vaccination for all new vaccines. Each week, each site updates dynamic data files, and the coordinating center analyzes all data cumulatively. Repeated analysis of the same data requires adjustment for multiple testing. To address this issue, VSD uses sequential statistical methods. Evaluation of H1N1 vaccine safety poses special challenges, including confounding by indication, seasonality, and new priority groups including pregnant women. We are using several analytic methods, including: (1) Self-controlled case-series, which compares exposed vs. unexposed time windows within the same individual; (2) Poisson, which compares the outcomes during the current season with expected rates based on historical data for seasonal influenza vaccine; and (3) Difference-in-difference, which compares the relative risk in exposed vs. unexposed time windows for H1N1 vaccine during the current season with the relative risk for seasonal influenza vaccine during cumulative prior seasons. **Results:** Pre-specified outcomes of interest include: Guillain-Barre syndrome, neuropathies, seizures, encephalitis, Bell's palsy, ataxia, anaphylaxis, spontaneous abortion, pre-eclampsia, stroke, myocarditis and wheezing. Historical rates of these outcomes were calculated for time windows after seasonal influenza vaccination in prior seasons (2000/01-2008/09). The sequential analysis methods above will be used, and relative and absolute risks will be estimated for each outcome. For outcomes found associated with vaccination in preliminary analyses, additional evaluation will be conducted using temporal scan analyses, logistic regression, and when appropriate, medical record review.

Keywords: H1N1 safety, Influenza A vaccine monritoring, Vaccine Safety Datalink Project

doi:10.3121/cmr.2010.943.c-b5-02

C-B5-04:

An Algorithm for Classifying Potential Cases of Amyotrophic Lateral Sclerosis from Electronic Health Records Using Decision Tree Analysis

Kathleen Albers, MPH[1]; Stuart Hoffman, DO[2]; Judith Readon, MS[2]; Mark Hornbrook, PhD[3]; Alison Naleway, PhD[3]; Joanna Bulkley, PhD[3]; Susan Andrade, PhD[4]; Daniel Newman, MD[5]; David Nerenz, PhD[5]; Margaret Gunter, PhD[6]; James Burmester, PhD[7]; Priscilla Velentgas, PhD[8]; Daniel Strickland, PhD[9]; Stephen Van Den Eeden, PhD[10]

[1]Kaiser Permanente; [2]Geisinger Medical Center; [3]Kaiser Permanente Northwest; [4]Meyers Primary Care Institute; [5]Henry Ford Health System; [6]LCF Research; [7]Marshfield Clinic Research Foundation; [8]Harvard Pilgrim Health Care; [9]Kaiser Permanente Southern California; [10]Kaiser Permanente Northern California

Background/Aims: The CDC is developing a national amyotrophic lateral sclerosis (ALS) registry that would be based on electronically available medical records and claims. The HMORN contracted with the CDC to help examine the feasibility of doing this in locations (e.g., HMOs) where complete longitudinal records are more likely to be available. Any final system used by the CDC will require an algorithm to classify putative cases. Our aim was to develop an automated algorithm to classify putative cases of ALS and other motor neuron diseases using electronic health records. **Methods:** We identified potential cases of ALS by review of inpatient, outpatient, other provider services, mortality and pharmacy data for any evidence of ALS or, more generally, motor neuron disease (MND) from 2001 to 2005 at Kaiser Permanente, Northern California. The records of each individual were reviewed to classify into five categories: probable ALS, not ALS, other MND (not ALS), insufficient information, or unclear. Classification And Regression Tree (CART) analyses were used to create an algorithm based on a comprehensive set of variables that may predict the likelihood of having true ALS (or, conversely, ruling them out). **Results:** Multiple algorithms were developed with key variables being number times an ALS code appeared in the record, physician-type making diagnosis, alternative diagnoses, mortality records, and length of follow-up. In our best model, we were able to correctly classify 99.6% of those originally determined to be probable ALS. However, there remain a substantial number of individuals classified by review or algorithm in the unclear, insufficient, or other MND categories. In addition, with this analytic approach, the "costs" of misclassification can be modified, and we will present alternative algorithms with a discussion of the benefits and disadvantages of each. Validation analysis results conducted in a second HMO will be presented. **Conclusions:** An algorithm was developed that appropriately classifies the vast majority of probable ALS cases. However, given the lack of detail in some records and the difficulty in diagnosing some clinical cases, there will be some misclassification when based solely on electronic medical records.

Keywords: Amyotrophic Lateral Sclerosis, Electronic health records, ALS Classification

doi:10.3121/cmr.2010.943.c-b5-04

PS1-15:

A Method for Discovering Variant Spellings of Terms of Interest in Clinical Text

David Carrell, PhD[1]; David Baldwin, BS[1]

[1]Group Health

Background and Aims: Mining information from unstructured clinical text requires knowledge of synonyms and variant spellings corresponding to the term of interest. Lexicons such as the Unified Medical Language System identify recognized synonyms but are less helpful in identifying variant spellings or locality-specific language. Natural language processing algorithms employing dictionary look-ups frequently miss terms because of variant spellings, accounting for as much as 25% of algorithm failures. This problem is not easily resolved deductively or through domain expertise. We describe an inductive, empirically-driven method that identifies synonyms/variant spellings of a concept of interest. **Methods:** The conceptual basis for this method is the principle that terms with similar meanings tend to be found in similar textual contexts. Accordingly, sets of words found with high frequency in the context of two synonyms will overlap with high probability. Call the word of interest the target term; call the high-frequency words around it context terms; call words most likely to be synonyms/variants synonym candidates. A four-step process can be used to identify variants. Step 1: Identify the target term's highest frequency context terms. Step 2: Identify terms found in high frequency near each of the context terms. Step 3: Eliminate Step 1 & 2 terms appearing more often outside the context than in it. Step 4: Manually review remaining synonym candidates to identify true synonyms/variants. Using SAS we illustrate the method for target term HER2/NEU in Group Health chart notes for 2008, representing 200,913,281 lines of clinical text. **Results:** Four of the top 20 context terms near HER2/NEU had ratios of in_context_occurrence/out_of_context_occurrence > 1: OVEREXPRESSION, ONCOGENE, OVEREXPRESSED, C-ERBB-2. These context terms occurred 1196, 617, 540, and 170 times, respectively, and produced lists of 205, 119, 143, and 54 of their own context terms, respectively (excluding words with frequency < 2). Manual review yielded a final set of 23 synonyms and spelling variants, including HER-2, HER/2, HER-2-NEU, HER2/NUE (note spelling: "NUE"), FISH, IHC, and C-ERB-B-2 among others. **Conclusion:** The method describe provides an easily implemented approach to identifying synonyms/variants of terms of interest that can be used to enhance strategies for identifying concepts in clinical text.

Keywords: Identifying variant spellings, clinical text, medical terminology

doi:10.3121/cmr.2010.943.ps1-15

PS1-16:

Disenrollment Rates Among HMORN Sites by Age, Gender, and Medical Condition

Jennifer Ellis, MBA, MSPH[1]; Marsha Raebel, PharmD[1,2]; Addie Clark, BA[1]; Susan Andrade, ScD[3]; Robert Davis, MD, MPH[4]

[1]Kaiser Permanente Colorado; [2]University of Colorado; [3]Fallon/Meyers; [4]Kaiser Permanente Georgia

Background: It is often desirable to include enrollment and disenrollment (or, conversely, retention) information in grant applications. Overall disenrollment has been evaluated as part of Virtual Data Warehouse quality

assurance work, but disenrollment by member characteristics has been incompletely characterized. This information is important in longitudinal outcomes research. **Aim:** To calculate member disenrollment across HMORN sites by age, gender, and selected disease states. **Methods:** Baseline membership cohorts were identified for 8 consecutive years (2000-2007) at 9 HMORN sites. Members were included in a baseline cohort year if they were enrolled for at least 305 days in that year. Disenrollment, defined as having fewer than 305 days of membership in a year, was assessed at 1, 3, and 5 years for each cohort. Members who died before the end of each assessment period were censored. Comorbidity was assigned based on ICD9 diagnosis code(s) for diabetes, asthma, heart failure, hypertension, hyperlipidemia or depression over a three-year period ending with the end of the cohort baseline year. SAS code was prepared at one site for distribution to other sites to run against VDW tables. **Results:** While overall disenrollment varied across the participating sites, within-site disenrollment changed little from year to year. In general, 1-year disenrollment rates varied from 7% to > 22%; 5-year disenrollment rates ranged from < 30% to > 60%. Using one site as an example, peak 1-year disenrollment was seen among the 20-29 year old age group; lowest rates were seen among those age 60 years and older. Similar patterns were seen at 5 year follow-up, although differences between highest and lowest rates were smaller. Disenrollment rates were slightly higher among males. Disenrollment among members with any one of the measured diseases was lower than among members without that condition. **Conclusions:** Disenrollment (and retention) rates vary by age and disease state and less so by gender. While overall disenrollment is useful for many purposes, rates by member characteristics can be essential while planning studies of specific populations.

Keywords: HMORN, Participant characteristics, Enrollment studies

doi:10.3121/cmr.2010.943.ps1-16

PS1-17:

Herpes Zoster in Children

Sheila Weinmann, PhD, MPH[1]; Colleen Chun, MD[1]; Karen Riedlinger, MPH, ASCP[1]; Michelle Roberts, MSN, FNP[1]; Mary Rix, RD[1]; Mona Marin-Nelson, MD[2]; Scott Schmid, PhD[2]

[1]Kaiser Permanente Northwest; [2]Centers for Disease Control and Prevention

Background and Aims: Vaccine-strain herpes zoster (HZ) is a potential adverse outcome of varicella vaccination. Data are needed on the incidence of and risk factors for vaccine-strain HZ among children <18 years of age. The Centers for Disease Control and Prevention (CDC) funded a study at Kaiser Permanente Northwest (KPNW) to determine the number and proportion of pediatric HZ cases caused by varicella vaccine, assess positive predictive value (PPV) of physician diagnosis of HZ, and compute incidence of vaccine and wild-type HZ in the KPNW population. **Methods:** We used electronic data to identify all pediatric medical office visits with a HZ diagnosis. During the visit, the provider collected a lesion specimen and completed a questionnaire. The study nurse called to interview the parent and, if no specimen was previously collected, schedule a home visit to obtain it. A follow-up questionnaire on severity and duration of HZ was returned four weeks after rash onset. Specimens were sent to the National Varicella-Zoster Virus (VZV) Laboratory at the CDC for PCR analysis to confirm presence of the virus and classify it as wild-type or vaccine-type. **Results:** From 5/2005 to 3/2009, we enrolled 308 subjects in the study. Two-hundred eighty-one (96%) had adequate lesion specimens for PCR analysis. We found VZV in 75% of adequate specimens; 69% were wild-type, while 9% were vaccine-type and 1% (2) were vaccine:wild-type recombination. Among vaccinated subjects, 69% had wild-type HZ. The PPV for provider diagnosis of 'definite HZ' was 83%: 85% for unvaccinated subjects and 76% for vaccinated subjects. Incidence rates for vaccine-strain and wild-type VZV in plan children age 0-17 will be presented. **Conclusions:** Vaccine-strain VZV was found in a minority of HZ cases in this age group. We observed recombination of vaccine-strain and wild-type viruses in two subjects. Provider diagnosis of HZ was good overall.

Keywords: Herpes zoster, Diagnosis of herpes zoster, Varicella vaccination

doi:10.3121/cmr.2010.943.ps1-17

PS1-22:

Premature Birth, Initial Hospital Length of Stay, and Costs

Mary Ann Blosky, MS, MHA[1]; Zhengmin Qian, MD, PhD[1]; G. Craig Wood, MS[1]; James Betoni, DO[1]; Libby Black, PharmD[2]; Andrea Wary, BS, RN, MS[1]; Harry Mateer, MD[1]; Walter Stewart, PhD, MPH[1]

[1]Geisinger Health System; [2]GlaxoSmithKline

Background: Preterm birth disparities with their associated geographic, socioeconomic status and race/ethnicity factors are among the most widely recognized and least understood phenomena in the study of reproductive health. Previous studies have focused on total cost; few studies have disaggregated total charges into their components for both the preterm infants and their mothers or compared such costs to full-term births. **Aim:** To quantify and disaggregate initial hospital charges among preterm infants and their mothers compared to full-term controls. **Methods:** The study populations were comprised of mother-infant dyads that included 746 preterm cases and 3372 controls. Data were obtained from the Geisinger outpatient electronic health record, Geisinger Medical Center billing records, and the inpatient pharmacy billing database in the Geisinger Health System. Measures were derived for hospital charges, lengths of stay for infants and mothers, and the mean delivery hospitalization charges for the subset of infants and mothers who had the most frequent diagnoses, procedures, and drug classes. **Results:** The mean hospitalization charges ($103,000 versus $7,000) and the length of stay (16.1 days versus 2.3 days) were substantially higher for preterm infants versus controls. Extreme preterm infants (< 26 weeks) accounted for 1.3% of the total preterm births and approximately 20% of the total initial hospital charges and near term infants (33-36 weeks) accounted for approximately 14% of total births and 30% of the total charges. The most frequent inpatient medical conditions were five to 17 times as frequent among preterm infants as among the controls. The most frequent procedures and drug classes were also generally more prevalent among preterm infants. Preterm infants had generally higher charges related to inpatient diagnoses, procedures and medication utilization. The mean hospitalization charges ($23,000 versus $15,000) and length of stay (i.e., 5.1 days versus 2.3 days) was also higher among the preterm mothers than controls. Medication utilization was compared between the two groups and preterm mothers had higher charges related to inpatient diagnoses, procedures and medication utilization compared to controls. **Conclusions:** The most extreme premature (4.3%) of preterm births accounted for 47% of the total preterm hospital charges. Overall costs increased as gestational ages decreased.

Keywords: Preterm birth disparities, Preterm hospitalization costs, Reproductive health

doi:10.3121/cmr.2010.943.ps1-22

PS1-23:

The Environmental Scan: A Valuable Community Health Research Tool

Virginia Scobba, MLS, MA; Group Health Cooperative

Background and Aims: The environmental scan (ES) focuses on the identification, collection, and translation of external information that may potentially influence an organization's decision making process. An ES allows an organization to address social, economic, political, and technical issues that may not be readily apparent and enables a comparative evaluation of the organization's internal strengths and weaknesses. Through understanding external elements and internal processes, the organization can respond in a more auspicious and productive manner. Health researchers are employing ESs to build on established knowledge with the goal of improving the design and effectiveness of community health programs. **Methods:** There is no one correct methodology for conducting an ES, but typically, ESs are characterized by several features. Initially, a broad spectrum of issues is examined, involving social, political, technological and other trends. Second, information may be gathered from a variety of sources, including literature reviews, surveys, interviews, focus groups, and site visits. Third, critical analysis and dissemination of collected data is promoted by the recruitment of experts from both inside and outside the fields being scanned. ESs can utilize a wide sweep of information sources, ranging from formal, established data, such as

published reports, to informal, personal contacts. Accordingly, scans may employ varying degrees of high to low technologies, ranging from Internet searches to conversations with community leaders. **Results:** Through the analysis of environmental or contextual factors, researchers can gather information to guide the design of effective health programs that are geared toward and incorporate the needs of specific communities. Recently, health researchers have used ESs to assess and improve services in a variety of community projects, including mental health, nutrition, women's health and cancer screening. These studies verify that the ES can be a vital tool in providing overall strategic direction of project development, in promoting community activation, and in raising awareness of future studies. **Conclusion:** Because of its flexible framework, the ES is a creative tool for health decision making. It is important that health researchers are knowledgeable about what this instrument entails in order to determine its potential use in community health research.

Keywords: Environmental Scans, Community health programs, Community health assessment

doi:10.3121/cmr.2010.943.ps1-23

PS1-24:

The Positive Predictive Value of a Hyperkalemia Diagnosis in Automated Health Care Data

Marsha Raebel, PharmD[1]; Colleen Ross, MS[1]; Michael Smith, PharmD, JD[1]; Gwyn Saylor, BA[1]; Leslie Wright, MA[1]; Craig Cheetham, PharmD, MS[2]; Christopher Blanchette, PhD[3]; Stanley Xu, PhD[1]

[1]Kaiser Permanente Colorado; [2]Kaiser Permanente Southern California; [3]Lovelace

Background and Aims: The positive predictive value (PPV) of a hyperkalemia diagnosis in administrative data has not been evaluated and relationships between coded hyperkalemia diagnoses, elevated potassium concentrations and clinical signs have not been assessed. The aims of this study were to determine the performance of a coded diagnosis in administrative data at identifying 1) clinically-evident hyperkalemia and 2) patients with potassium >= 6 mmol/liter. **Methods:** This retrospective observational study included 8,722 patients with diabetes newly-initiating ACEi, ARB, or spironolactone therapy. The outcome measure was the first hyperkalemia-associated event comprised of a hospitalization, emergency department visit or death that occurred within 24 hours of a coded hyperkalemia diagnosis and/or potassium >= 6 mmol/liter during the first year of therapy. The medical records of all patients identified from administrative data as having hyperkalemia-associated events were reviewed as were a random sample of records of patients identified as not having hyperkalemia. **Results:** Among the random sample (n = 99) of patients identified from administrative data as not having hyperkalemia, none had hyperkalemia upon record review. Among 64 patients identified from administrative data as having hyperkalemia, all had a hospitalization or emergency department visit associated with a coded hyperkalemia diagnosis (n = 41), potassium >= 6 (n = 9), or coded diagnosis and potassium >= 6 (n = 14). Of the 55 total patients with a coded hyperkalemia diagnosis, 42 (PPV 76%) had clinically-evident hyperkalemia; 32 (PPV 58%) had potassium >= 6. Of the 9 patients identified with potassium >= 6 who had no coded hyperkalemia diagnosis, 7 (PPV 78%) had clinically-evident hyperkalemia. Although 5 of the 64 patients died at the time of the hyperkalemia outcome, none had a coded diagnosis of hyperkalemia-associated death and hyperkalemia was not mentioned on the death certificate of any patient. **Conclusions:** Nearly one-fourth of patients with a coded hyperkalemia diagnosis do not have clinical signs and nearly one-half do not have potassium concentration >= 6 mmol/liter. Because both false positives and negatives occur when using coded hyperkalemia diagnoses to identify hyperkalemia-associated outcomes from administrative and death certificate data, medical record validation of hyperkalemia outcomes is necessary.

Keywords: Hyperkalemia diagnosis, Elevated potassium, Coded diagnosis data

doi:10.3121/cmr.2010.943.ps1-24

PS1-25:

Unintended Consequences of Implementing Healthcare Information Technology (HIT): A Survey of Users

Ted Palen, PhD, MD; Colorado Permanente Medical Group

Background: Health information technologies (HIT) such as electronic medical records (EMR), computerized physician order entry (CPOE), and clinical decision support systems (CDSS) have enhanced the quality, safety, and effectiveness of medical care. There is also optimism that widespread adoption of HIT in the United States would result in significant cost savings to both providers and consumers of healthcare. However, despite the potential benefits from adopting such technologies, the adoption rates of such technologies remain low. Many observers attribute the low adoption rates to the high financial cost of the technologies, but also to unintended consequences (UC) of HIT implementation. **Methods:** Online survey of HIT implementers in the HMO Research Network and American Health Information Management Association members. **Results:** Nearly 90% of the 224 respondents were administrators or managers. The UC occurred within EMR (37.4%, N = 83), eMAR (1.4%, N = 3), other HIT system (7.2%, N = 16), or a combination of ≥2 systems (54.1%, N = 120). Over 60% of the systems were hospital based and 52.5% were initial implementations while 19.8% were upgrades. The majority of UC involved technical problems (46.4%) or workflow issues (39.2%). Each of the following UC occurred about 30% of the time; increased workload, poorly integrated systems, or process errors. Even after remediation efforts, the UC persisted 79.7% of the time. **Conclusions:** UC are common in HIT and difficult to resolve. Involve all stakeholders in HIT planning, implementation, and remediation processes.

Keywords: Healthcare Information Technology, Medical record systems, Medical technology

doi:10.3121/cmr.2010.943.ps1-25

PS1-26:

Use of an Electronic Health Record to Facilitate the Enrollment of Patients in Prospective Randomized Clinical Trials: Lessons Learned from STABILITY Trial

Yvette Murley Henry, PhD[1]; Kristina Whitmire Evans, MPH[1]; Valerie Harkins, RN[1]; Yasmin Mahmud, BA[1]; Peter Berger, MD[1]

[1]Geisinger Medical Center

Background and Aims: Large clinical trials involving common chronic conditions may benefit from recruitment using an electronic health record (EHR). We developed a novel recruitment approach using our EHR to systematically identify all patients who appear eligible for such trials. **Methods:** Patients satisfying broad inclusion and exclusion criteria, defined primarily by ICD and procedure codes, were identified from the EHR and invited by letter to call to learn more about the study. The letter also informed patients that those who did not respond would be contacted by telephone 2 weeks later. The EHR of patients expressing interest were reviewed (pre-screened), the study was described in detail, and those who still appeared to be eligible were invited to come in for a screening visit. Patients were interviewed and examined (screened) to assure that they satisfied all inclusion and exclusion criteria and remained interested. Eligible and interested subjects were enrolled. The disposition of each potential patient was tracked through each phase (response to letter and/or follow-up phone call, result of pre-screening, number enrolled). **Results:** In STABILITY, a placebo-controlled trial of darapladib (a drug that lowers LP-PLA2) in patients with severe vascular disease, 5,300 patients satisfied broad inclusion/exclusion criteria and 1,687 were sent letters inviting them to call and express their interest in possibly participating in the trial. Of the 1,687 who received letters, 587 (35%) expressed interest (either by calling or in response to our follow-up call) and were pre-screened. Of the patients who did not respond, 341 were unable to be reached. Study enrollment closed before we were able to contact 92 patients who expressed interest. Overall, 148 patients were screened, and we enrolled 101 patients, more than any of the 158 other participating institutions in the USA and more than were enrolled in 41 of 45 participating countries. **Conclusions:** These data support the ability of an

EHR to effectively identify large numbers of patients interested in and eligible to enroll in a research study. The ability to more accurately identify patients who also satisfy the more "minor" inclusion/exclusion criteria would improve the efficiency and automation of this approach.

Keywords: Computer assisted recruitment, Electronic health record, Clinical trials

doi:10.3121/cmr.2010.943.ps1-26

PS2-01:

A System for Computer-Assisted Rapid Case Ascertainment of Breast, Lung and Colorectal Cancers

Roy Pardee, JD, MA; Group Health

Background and Aims: An intervention trial requiring recruitment of new cancer cases prompted this investigation into text classifier programs to identify pathology reports describing malignancies. Text classifiers are among the simplest Natural Language Processing methods, and are particularly useful for filtering large streams of documents. Our classifiers allowed study staff to concentrate their time on the reports most likely to result in recruitable subjects. The proposed presentation will describe our use of text classifiers as part of an efficient computer-assisted recruitment pipeline. **Methods:** We gathered corpora of pathology reports for breast, lung and colorectal tissue, each with a 'gold standard' assessment of whether they discussed a malignancy. We then randomly divided each into 75% training and 25% evaluation subsamples, trained the classifier on the training subsample and compared its categorizations to the gold standard in the evaluation subsample. We performed this training/evaluation cycle repeatedly, generating a distribution of predictive value statistics, thereby getting insight into the classifiers' sensitivity to the particular random division of corpus reports. More importantly, it allowed us to experiment with tweaks to the classifiers and to the basic text processing that preceded them, and quickly evaluate whether they contributed to the predictive power of the classifier. **Results:** Several enhancements contributed to the accuracy of the system. In particular, taking multi-word phrases in addition to individual words as features increased the classifier's predictive power. To our surprise, 'stemming' individual words (that is, reducing them to their root forms) did not have a perceptible effect. Once the classifiers were optimized, we were able to cover approximately 1600 path reports/week in approximately 30 minutes of a Research Specialist's time. As an added benefit, when the RS found that a report was flagged in error, the classifier was trained on that report, thereby improving its future performance. **Conclusions:** Text classifiers are an effective tool for optimizing the use of staff time in rapidly ascertaining cancer cases for recruitment. Furthermore, because the classifiers' training (including the corrections made during the study) is easily reduced to a file on disk, it becomes an independent asset, useful for future studies needing to do rapid ascertainment of cancer.

Keywords: Natural Language Processing methods, Text classifier programs, Rapid ascertainment of cancer cases

doi:10.3121/cmr.2010.943.ps2-01

PS2-05:

Does Socioeconomic Status Moderate the Association of Race with Morbidities During Pregnancy Episodes?

Douglas Roblin, PhD[1]; Peter Joski, MSPH[1]; Donald Bachman, MS[2]; Mark Hornbrook, PhD[2]

[1]Center for Health Research Southeast; [2]Center for Health Research Northwest

Background and Aims: African American adults generally have higher prevalence of morbidities than whites in the United States. Living in lower socioeconomic status (SES) neighborhoods increases the likelihood of poor health. The extent to which lower SES contributes to a higher rate of pregnancy complications for African Americans requires investigation. We explored racial differences in likelihood of maternal morbidities and whether these differences were moderated by neighborhood SES. **Methods:** Pregnancies were defined from linked birth certificates and hospital records. We studied 9,726 pregnancies for non-Hispanic African American women and 10,272 for non-Hispanic white women enrolled with Kaiser Permanente Georgia (KPGA) from 2000-2006. Morbidities during pregnancy were ascertained from all outpatient and inpatient diagnoses and procedures classified by a previously validated maternal morbidity grouper. SES was measured from a factor analysis of 7 US Census measures associated with tract or block group of residence. Factor scores were divided into quartiles. Likelihood of selected morbidities was estimated using logistic regression adjusted for race, SES quartile, and mother's age. Parameter estimates were adjusted for repeated observations (pregnancies) per woman during the study period. **Results:** 14% of pregnancies were characterized by anemia, 13% by hypertension, and 7% by mental disorders. African American women were more likely than white women to live in lowest SES quartile neighborhoods (34% vs. 16%; $p<0.05$). Adjusted for age and SES, pregnancies characterized by anemia and hypertension were significantly more likely among African Americans than whites (OR = 2.24 and 1.30, respectively). Mental disorders were significantly less likely among African Americans (OR = 0.50). Adjusted for age and race, low SES neighborhoods had a significantly greater moderating effect among whites than among African Americans. Among whites, the adjusted ORs for the lowest SES quartile (vs. highest) were 1.21 (95% CI: 1.40, 1.01) for hypertension, 1.97 (95% CI: 2.40, 1.61) for anemia, and 1.27 (95% CI: 1.57, 1.03) for mental disorders. **Conclusions:** Neighborhood SES had a significant moderating effect on selected morbidities during live birth pregnancy episodes in this HMO. Compared to African American women, living in low SES neighborhoods significantly increased the risk of major morbidities during pregnancy episodes among white women.

Keywords: Maternal morbidities, Minority health disparities, Socioeconomic status and pregnancy

doi:10.3121/cmr.2010.943.ps2-05

PS2-06:

Feasibility of Determining Medication Adherence from Electronic Health Record Medication Orders

Nikki Carroll, MS[1]; Capp Luckett, BA[1]; Jennifer Ellis, MSPH[1]; Marsha Raebel, PharmD[1]

[1]Kaiser Permanente Colorado

Background and Aims: Medication adherence is essential to optimizing outcomes for many chronic diseases. Typically, calculation of adherence is based on dispensings identified from pharmacy claims databases. However, this procedure excludes prescription orders that are never dispensed and potentially results in biased adherence estimates. To explore extracting newly-ordered medications from the Electronic Health Record (EHR), we conducted a project to: 1) Determine the process needed to identify ordered medications from the EHR, 2) Apply the process to identify a study cohort, and 3) Validate the process with medical record review. **Methods:** The study team prepared an inclusive list of study drugs, identified EHR tables and fields that contained medication order data, explored methods that facilitated inclusion of only the final medication order (when applicable), and explored optimal sequencing of inclusion criteria. These four steps were then used to identify a patient cohort newly-prescribed an antihyperlipidemic agent, and record review was used iteratively to validate each process step. **Results:** Multiple challenges were encountered and solutions identified. First, drug orders in the EHR were based on an unfamiliar drug categorization scheme. Second, Clarity tables, fields and linkages required exploration to discern useful data elements. For example, the "stop reason" field was not useful in identifying cancelled orders and the "order date" was occasionally over-ridden by the most recent refill of that order. Other factors complicating identifying new orders included human error, reversed orders, sending orders to incorrect dispensing locations, and medication reconciliation after nursing home discharge. We also found that by changing the order in which we applied the selection criteria resulted in a "cleaner" data set. For example, applying diagnosis criteria earlier in the process allowed us to remove prevalent users and their refill history. **Conclusion:** Identifying medications ordered in the EHR, particularly medications ordered but not dispensed, was a process fraught with multiple challenges. We believe, however, that we have

developed an iterative process that yields a reliable medication order algorithm. This is an important first step in achieving less biased estimates of medication adherence in chronic disease populations.
Keywords: Medication adherence, Electronic Health Record, Medication algorithm orders

doi:10.3121/cmr.2010.943.ps2-06

PS2-09:

Relation of Practice Level Blood Pressure Management to Patient Cardiovascular Events: The Blood Pressure Disease Management Index

Thomas Vogt, MD, MPH[1]; Andrew Williams, PhD[1]; Adrianne Feldstein, MD[1]; Chuhe Chen, PhD[1]; Mark Schmidt, BS[1]; Richard Meenan, PhD[1]

[1]Kaiser Permanente

Background and Aims: Despite the proliferation of care guidelines, widespread practice variation is common. Longitudinal electronic health records (EHR) provide an opportunity to observe how care variations are related to care outcomes. This study uses blood pressure management to illustrate the uses of the Disease Management Index (DMI) to relate care quality to cardiovascular outcomes. **Methods:** The Blood Pressure Disease Management Index (BP-DMI) incorporates the level of control of BP and the time out of control into a single index scored from 0 to 100. The practice level DMI for a given year is the average DMI for all diagnosed hypertensive patients in the practice. We observed practice level BP-DMI scores for 199 to 374 primary care physician (PCP) practices for the years 1998-2007 (Oregon) and 2005-2007 (Hawaii) and related those scores to annual incidence rates of myocardial infarction (MI), stroke, and congestive heart failure (CHF) hospital days. **Results:** Systolic BP (SBP) control was much worse than diastolic BP (DBP) control, particularly before 2005, but improved steadily from that point on. Practice variations in BP control were substantial. Propensity scores were used to adjust for the substantial differences in patient risk across practices. On average, clinicians treating elevated DBP had patients who were younger and healthier than those treating elevated SBP. Propensity adjusted incidence rates of MI, stroke, and CHF hospital days were strongly associated with both systolic (S) and diastolic (D) BP-DMI scores ($p < .0001$ to $< .02$). The estimated effect of increasing the SBP and DBP DMI scores from the 50th percentile to the 60th percentile of clinical practices for MI and stroke incidence, and CHF hospitalization was:

SBP: -7.2%, -4.6%, -8.4%, respectively
DBP: -17.6%, -20.1%, -20.0%, respectively.

Conclusions: Practice level BP-DMI scores over a ten-year period are strongly related to the incidence of cardiovascular events including hospital days for CHF. The DMI is an effective tool for relating practice patterns to morbidity risk and health care utilization.
Keywords: Blood pressure management, Disease Management Index, Health outcomes

doi:10.3121/cmr.2010.943.ps2-09

PS2-10:

The Potential Use of Area-Based Population Characteristics for Targeted Selection and Balancing of Recruitment into Health Literacy Interventions

Douglas Roblin, PhD[1]; Josephine Calvi, MPH[1]; Brandi Robinson, MPH[1]; Kathleen Mazor, EdD[2]

[1]Kaiser Permanente Georgia; [2]University of Massachusetts Medical School

Background and Aims: Individual-level socioeconomic are rarely available for enrollees of health care systems in the US. Research to selectively target participation from, or to balance recruitment across, specific socioeconomic subgroups must rely on other measures. We used of area-based measures from US Census tract records to target participant recruitment by level of formal education and race into a health literacy study. Our objectives were to obtain balanced proportions of participants: 1) with a high school (HS) education or less, and 2) who were African American (AA) or white. **Methods:** Kaiser Permanente Georgia (KPG) is one of 3 sites participating in an NCI-funded study to develop and evaluate a computer-based assessment of health literacy. At KPG, the goal is to recruit 300 participants from enrollees 25-74 years of age who were geocoded to their US Census tract using residential addresses (N=185,150). Census tracts were linked to US Census SF-3 data to obtain percent AA) residents and percent of adults with a HS education or less in each tract. Approximately 400 participants were randomly selected from each of 9 strata defined by high, moderate, and low tertiles of percent AA residents and, within each tertile of AA, into tertiles of percent of adults with a HS education or less. **Results:** 189 assessments have been completed among 1,947 invited to date. 58.7% (N=111) of participants were AA; 34.9% (N=66) were white. Self-reported race and formal education of participants paralleled the percent AA residents and percent adults with a HS education or less in the US Census tracts. By race tertiles, 85%, 57%, and 16% of participants were AA compared to 86%, 24%, and 4% of US Census tract residents. By education tertiles, 33%, 19%, and 10% of participants had a HS education or less compared to 56%, 32%, and 22% of US Census tract adults. **Conclusions:** Initial results indicate this sampling strategy is achieving study goals of recruitment of proportional numbers of AA and white participants and, within race, adequate numbers with a HS education or less. Area-based measures of race and education may facilitate targeted recruitment in the absence of individual-level data.
Keywords: Computer-based assessments, Health literacy interventions, Targeted recruitment

doi:10.3121/cmr.2010.943.ps2-10

PS3-03:

Creation and Validation of the Electronic Medication Possession Ratio (eMPR)

Joseph Leader, BA[1]; G. Craig Wood, MS[1]; Nirav Shah, MD, MPH[1]; JB Jones, PhD, MBA[1]

[1]Geisinger Health System

Background and Aims: Medication adherence studies usually rely on a narrow aspect of a patient's medication history. Studies using administrative claims data such as insurance pharmacy claims cannot compute adherence for patients who don't fill their medication orders or who use spousal benefits. Studies using medication orders from the electronic health record (EHR) assume that all patients fill their medication orders. Linking EHR medication orders to pharmacy claims can create a more robust picture of a patient's medication history. The aim of this study was to create an algorithm for linking EHR orders to pharmacy claims to create a new metric of medication adherence – the eMPR (electronic Medication Possession Ratio). **Methods:** Patients included in this study had a Geisinger primary care clinic provider while enrolled with the Geisinger Health Plan. Overlapping information across the EHR medication order database and the pharmacy claims database were used to identify likely matches between a prescription and subsequent fill. The overlapping data includes medical record number, order and fill dates, days supply, and National Drug Code (including medication name and dose). To evaluate the usefulness of the algorithm, the percent of claims that matched to an order was calculated. **Results:** The linking algorithm is currently being tested as part of ongoing research to be completed by the time of the HMORN Annual Meeting (results pending). Several challenges identified include: 1) Developing a method of linking EHR orders to pharmacy claims; 2) Creating a link for medication orders and multiple refills, as each generates unique pharmacy claims; and 3) Linking generic forms of the prescribed medication to name-brand prescriptions written. Initial results indicate a high degree of matching which fluctuates based on assumptions provided to the algorithm. **Conclusions:** Medication orders and pharmacy claims can be used to create a link between a patient's order and their pharmacy claim or "fill." The addition of medication orders to the HMORN Virtual Data Warehouse may be valuable for improving the quality of medication adherence research within the HMORN, and lay the foundation for an eMPR which can be widely used in many settings.
Keywords: Medication adherence, Computer-based medication orders, Electronic Medication Possession Ratio

doi:10.3121/cmr.2010.943.ps3-03

Virtual Data Warehouse

C-A5-01:
Clarity and Research

Jamila Gul, BS[1]; Mark Schmidt, BS[2]; Lauren Perkins, BS[3]

[1]Kaiser Northern California; [2]Kaiser, Hawaii; [3]Kaiser Permanente

Clarity is the reporting database for Epic data. Clarity was created to extract data from the Epic production server and store it in a relational database and a dedicated reporting server. Clarity can reside on variance platforms such as Teradata or Oracle. Most tables in Clarity are updated nightly by a feed from Chronicles. There are also weekly and monthly updates for the more static tables. Queries and reports generated from Clarity can be are very comprehensive and provide complete information at the individual data point level.
Keywords: Virtual Data Warehouse, Data extraction, Data storage
doi:10.3121/cmr.2010.943.c-a5-01

C-A5-03:
Virtual Data Warehouse (VDW) Architecture and Implementation

Debbie Godwin, BS[1]; Monica Silcott[1]; Daniel Ng, BS, BSE, MBA[2]

[1]Scott & White; [2]Kaiser Permanente Northern California

Background and Aim: VDW system architecture varies from one institution to another. This provides an opportunity for the development of best practice in system architecture design. The word architecture describes the underlying structure of networks, computer hardware and software. Well-designed systems-level architectures are critical to the success of large-scale projects. The explosion of technological opportunities and customer demands has driven up the size, complexity, cost, and investment risks of projects. Without solid architectures, these projects lack the firm foundation and robust structure on which to build. Solid systems architecture and design is a required phase following data gathering and analysis which should precede any design prior to any implementation. With functional requirements established, the system architect can design a system to perform in an optimized environment, ultimately producing robust data and customer satisfaction. Architecture choices Hardware platform DBMS –Relational Database Management System (RDBMS)Query/analysis tools Maintenance/ service strategy. For bioinformatics research, the most important qualities of system architecture are: extensibility for new functions/features; interoperability for cross-site collaboration; security due to regulatory and ethical requirements; serviceability/maintainability to support independence from enterprise/business computing; and performance for analysis of large datasets. Aim of this study was to determine best practice architecture choices resulting in performance improvements per institutions data volume. **Methods:** Performance benchmarking analysis was gathered from KPNC and S&W comparing the effect on VDW performance of different design choices and implementations of database software and hardware. Our performance measurement focused on the delivery speed of data return. Measurements were made on various data areas at both peak and off-peak times. **Results:** KPNC has measured via benchmarking on VDW tables that Oracle DBMS can increase performance compared to SAS datasets. KPNC was able to measure separately the performance improvement from migration to a more powerful hardware platform. **Conclusions:** A proactive, best practice approach to systems architecture can create benefits for research databases, particularly in performance speed. Improvements in performance can be achieved through software, by adopting a relational database management system such as Oracle, that allows table indexing and partitioning, and through investment in high-performance hardware. The two strategies can be implemented alone or in conjunction for maximum benefits.
Keywords: Virtual Data Warehouse, Health data improvement, Health data performance analysis
doi:10.3121/cmr.2010.943.c-a5-03

C-A5-04:
A Simple, Accurate SAS Algorithm for Electronic Abstraction of Race from Digitized Progress Notes

Douglas Roblin, PhD[1]; Peter Joski, MSPH[1]; Junling Ren, Med[1]; Robert Farmer, PhD[2]; David Baldwin, PhD[3]; David Carrell, PhD[3]; Gene Hart, MS[3]; Roy Pardee, JD[3]; Donald Bachman, MS[4]

[1]Kaiser Permanente Georgia; [2]University of Massachusetts; [3]Group Health; [4]Kaiser Permanente Northwest

Background and Aims: Individual-level race/ethnicity is important for research into causes and consequences of health disparities. For various non-research reasons, it has rarely been collected on enrollees in integrated delivery systems. Individual-level race/ethnicity can be found in medical record documentation. Manual abstraction on large numbers of medical records is costly. We developed a simple SAS algorithm for electronic abstraction of white and African American race from digitized progress notes and evaluated its accuracy by comparing electronically abstracted race with other data sources. **Methods:** A simple SAS algorithm, based on text search strings (e.g. white male, African American woman), scanned digitized progress notes for provider face-to-face visits from 2005 through July 2009 in Kaiser Permanente Georgia's (KPG) and Group Health Cooperative's (GHC) electronic medical record systems. White and African American race was abstracted. If the patient had more than 1 visit with abstracted race, the patient was classified using the earliest visit. Abstracted race was linked at the individual-level to survey datasets with self-reported race (2005 survey of working age adults, 2007 survey of adults with hypertension, 2000-2005 Medicare surveys) and mother's race on 2000-2006 birth certificates. White and African American race was abstracted from GHC progress notes from 2005 through July 2009 using the same algorithm and compared to self-reported race on health risk appraisals. Accuracy of the SAS algorithm was assessed by overall proportion matching race from the other datasets, Cohen's kappa, and McNemar's test. **Results:** White or African American race was electronically abstracted for 56,261 KPG and 6,427 GHC enrollees. Abstracted race matched race from the other datasets in 97-99% of enrollees. Cohen's kappas were highly significant ($p<0.05$), ranging from 0.939 ± 0.013 (N=657 matches with hypertension survey records) to 0.994 ± 0.006 (N=518 matches with Medicare surveys). McNemar's tests were marginally significant for several datasets; and, misclassification was not systematically biased toward white or African American race. **Conclusions:** The SAS algorithm was highly accurate in electronically abstracting white and African American race from digitized progress notes of provider visits at KPG and GHC. We are expanding the evaluation to include additional sites and additional race/ethnic categories (e.g. Asian, Hispanic).
Keywords: SAS Algorithm for race abstraction, Race classification, Research and race
doi:10.3121/cmr.2010.943.c-a5-04

C-C1-01:
Building the Hypertension Registry: Adventures in Using the VDW Model

Heather Tavel, BS[1]; Teri DeFor, MS[2]; Bix Swain, MS[3]; Nicole Schneider, BA[2]; Janelle Lee, MHA, DrPH[3]; Susan Shetterly, MS[1]; Patrick O'Connor, MD, MPH[2]; Joseph Selby, MD, MPH[3]; David Magid, MD, MPH[1]

[1]Kaiser Permanente Colorado; [2]HealthPartners; [3]Kaiser Permanente Northern California

Background/Aims: The Hypertension Registry was built to support research on the recognition, detection, and treatment of hypertension at three HMO Research Network (HMORN) sites. The goal was to build a data mart modeled after the Virtual Data Warehouse (VDW) containing patients identified as hypertensive. Two of the sites already had VDWs in place at the start of the project, while the third site used the project as a springboard to build a VDW. **Methods:** A team consisting of data managers and analysts from each site met weekly in order to 1) determine exactly which existing VDW elements and possibly new fields would be required to support

hypertension studies, 2) help the VDW development efforts by clarifying data element creation rules and interpretations, and 3) document any new columns or tables in a Hypertension Registry data dictionary. All three sites had equal responsibility for registry development, documentation, and writing distributed code for quality checks rather than a lead site being designated for these efforts. **Results:** An algorithm for defining hypertension was used to create a "superset" of hypertensive patients. Using the protocol as a guide, the data team examined existing VDW tables to determine if all aims could be met with current data elements and developed solutions for additional variables or tables necessary to support planned papers. Challenges to harmonization of data elements were encountered in relation to data quality, data availability, and differing business models. Data team members gained a better understanding of the strengths and benefits of having a VDW in place, but also learned of areas where differing interpretations of the VDW data dictionary necessitated rework in the VDW or the need for better documentation. This presentation or poster will share how the team attempted to resolve these challenges in order to aid similar studies in the future. **Conclusions:** The Hypertension Registry is currently supporting at least 12 different hypertension papers and has been fully documented so that Hypertension Registries could potentially be built at additional sites. Continued discussion of VDW supported research efforts within the HMORN community is needed to learn how to best identify and create efficiencies.

Keywords: Hypertension Registry, Virtual Data Warehouse, Algorithm for defining hypertension

doi:10.3121/cmr.2010.943.c-c1-01

C-C1-02:

Creating a GIS Infrastructure to Evaluate Air Quality's Effect on Health Outcomes

Rick Krajenta, BS[1]; Lois Lamerato, PhD[1]; Jason Booza, PhD[2]; Alice Grgicak-Mannion[3]; Helen Krause[2]; John Reiners, PhD[2]; Delbert Raymond, RN, PhD[4]; Linda Weglicki, PhD, RN[5]

[1]Henry Ford Health System; [2]Wayne State University; [3]University of Windsor; [4]Eastern Michigan University; [5]National Institutes of Health

Background and Aims: Air pollution exposure is a complex and heterogeneous condition. The association of air pollution with disease is consistently established in many epidemiological studies. This creates a need for an infrastructure to measure both air pollution levels and health outcomes geospatially. **Methods:** As part of the North American Public Health Institute, we developed a multidisciplinary, international research team encompassing Windsor, Ontario, Canada and Detroit, Michigan, USA. While this geographic region consists of a single air-shed it exhibits different socioeconomic conditions and health delivery systems. We deployed 100 active and/or passive pollution samplers across this common air-shed based on U.S. Environmental Protection Agency guidelines for ambient air monitoring to determine levels of gaseous (i.e., NO2, SO2), volatile and particulate pollutants at a resolution greater than what is currently available. We are collecting asthma-related health outcomes for the populations residing within this region using emergency room, clinic, and hospital encounters from American and Canadian health care providers. Utilizing global positioning satellite for pollution sampler allocation and geocoding technique for patient address location, we created a complex mappable system to relate air pollution components and levels to health outcomes. **Results:** Air pollution levels can be linked to asthma events by several mechanisms. The first step is to use direct measurement value of the closest sensor by creating Voronoi polygons and mapping the asthma events to that geographic area. Associations between pollution level and asthma exacerbation can be examined between these data set. Models of the pollution levels using land use regression can increase the resolution beyond the point values. Longitude/latitude coordinates can be mapped to a pollution level in the surface generated by the model. **Conclusion:** Establishing a geospatial information system (GIS) integrated database with both pollution measurements and health outcomes creates a comprehensive resource. This infrastructure is flexible enough to investigate the effects of air pollution on many diseases, such as respiratory and cardiovascular disease, by physical and mathematic modeling. We can also compare health outcomes by health delivery system.

Keywords: Air pollution exposure, Geospatial Information System, Asthma-related Health outcomes

doi:10.3121/cmr.2010.943.c-c1-02

C-C1-03:

Using the Electronic Health Record to Create Population Denominators: Optimization Using Insurance Enrollment

G. Craig Wood, MS[1]; Jason Roy, PhD[1]; Joseph Leader, BS[1]; Walter Stewart, PhD[1]

[1]Geisinger Health System

Background and Aims: The HMORN includes research centers that are part of integrated delivery systems where the practice and insurance entities are independent (e.g., Geisinger, Marshfield). Rules for defining population denominators at these centers require acknowledging that patients in the practice population may not be members of the insurance entity. Methods for defining a population denominator for primary care patients from the electronic health record (EHR) can be validated in the subset of patients who are in the primary care system and members of the insurance entity. The aim of this study was to validate and optimize a method for calculating population denominators from the EHR. **Methods:** We proposed a method for defining population denominators from the EHR data at HMORN 2009. This method was based on describing utilization patterns of primary care patients' overtime. For this study, the cohort was limited to the subset of Geisinger primary care patients who were enrolled in the Geisinger Health Plan. Survival analysis was used to minimize bias in person-time estimates and incidence estimates. The aims were to identify optimal times from insurance enrollment to first utilization and time from final utilization to insurance disenrollment. Since the results are likely dependent upon gender and age (i.e. a typical gap in utilization will tend to be longer for young males as compared to older males), the analyses were compared across patient demographics. **Results:** To define cohort entry, the time between initial encounter and insurance enrollment was estimated using survival analysis. EHR enrollment was considered active until the patient failed to have any encounters with a primary care clinic for an age/gender specific cutoff of time. If the patient became inactive, the end date was imputed forward in time based on optimization from survival analysis using the insurance enrollment. These estimates were used to create an age/gender specific algorithm for calculating population denominators from the EHR. **Conclusions:** EHR utilization can be used to define population denominators. Validation of the proposed method was conducted by comparing results to insurance enrollment spans. This application is limited to clinical areas where there is evidence of relatively complete capture.

Keywords: Electronic Health Record, Defining population denominators, Data utilization

doi:10.3121/cmr.2010.943.c-c1-03

C-C1-04:

How to Win Friends and Influence People with the SAS Output Delivery System

William Tolbert, MA; Group Health Cooperative

Background and Aims: Long-time SAS users remember the days when SAS output was embarrassingly ugly. Version 7 saw the introduction of the Output Delivery System (ODS). ODS has matured into a very capable subsystem that gives users powerful reporting options. This presentation will highlight useful features and outline a macro-based system for handling multiple ODS destinations simultaneously. Nowadays there is no excuse for ugly SAS output! When building reports, SAS users should think about the needs of those using the reports. Some people just want to review frequency tables, and are happy to do so on a monitor. Others want to be able to print data for review in a meeting. And, there are always those that want to work with the data in a spreadsheet. Consider the ideal formats for each of the users

outlined above. For the casual data browser, HTML output is ideal. For printing, PDF is preferred. And for the additional analysis, Excel is a popular option. With ODS, we can meet all of these needs. **Methods:** Because ODS permits opening multiple output destinations simultaneously, a single procedure can be used to generate data in HTML, PDF, and Excel at once. The presentation will demonstrate the following: o- basic ODS syntax for HTML, PDF, and Excel output o- custom HTML table of contents o- using the ExcelXP tagset for multi-tab spreadsheets o- a custom macro for managing multiple ODS destinations simultaneously o- simple PROC Template code for easy customization o- techniques for consistent output from multiple platforms. **Results:** The techniques outlined here have been well-received in a variety of business reporting environments. **Conclusions:** The SAS ODS provides a wide array of reporting options. Don't limit yourself to just one type of output.

Keywords: SAS Output Delivery System, Reporting options, Output Delivery System destinations

doi:10.3121/cmr.2010.943.c-c1-04

PS3-04:

Cultivating an Environment and Attitudes Where Data Quality Improvement of the Virtual Data Warehouse Can Occur

Gwyn Saylor, BA[1]; Debra Ritzwoller, PhD[1]

[1]Kaiser Permanente Colorado

Background and Aims: The Virtual Data Warehouse (VDW) at the Institute for Health Research (IHR) at Kaiser Permanente Colorado (KPCO) is the data source of choice for the IHR analytic team. This research ready data source is important for efficient use of analytic team resources. Our aims are to 1) describe the attitudes, methods and processes that lead to high data quality in the VDW at KPCO, and 2) provide examples of improvement successes. **Methods:** The methods used to pursue VDW improvement include the following: 1) we gathered support from all local interested parties and provided avenues for all interested parties to participate in setting VDW file improvement priorities along with the allocation of available resources to support the process; 2) we worked to develop relationships with experts in data content areas throughout KPCO's clinical delivery system and those overseeing legacy source data systems; 3) we stayed informed of issues concerning the VDW by participating at the national level in committees concerned with VDW development; 4) we encouraged programmer networking at both the local and national levels; 5) we created an environment that encouraged detailed file documentation; 6) we encouraged two way communications between those using data files and those creating data files. **Results:** We found that nurturing a collaborative team spirit encouraged 1) the identification of key individuals best suited to improve specific files, 2) realistic estimates of time necessary to complete the improvement tasks, and 3) the freeing of time for those key individuals to perform these tasks. Engaging content experts outside of the IHR allowed for better understanding of legacy data files and allowed for lead time to respond to data system changes. Engaging programmer networks allowed for the development and sharing of best practices. Enhanced VDW file documentation lessened the chance of misinterpretation or misuse of data. Enhanced communication between those creating the VDW files and those using the files assure continued improvement. **Conclusions:** Good communication among many different parties and a supportive team spirit from local interested parties are necessary to facilitate the building and maintenance of a high quality research data structure.

Keywords: Virtual Data Warehouse, High quality research data, Quality data best practices

doi:10.3121/cmr.2010.943.ps3-04

Genetics

PS1-08:

Genetic Service Providers Identify Barriers Related to Referral, Counseling and Testing for Familial Cancer

Jody Jackson, RN, BSN[1]; Cheri Rolnick, PhD, MPH[1]; Alanna Rahm, MS[2]; Larissa Nekhlyudov, MD, MPH[3]; Katrina Goddard, PhD[4]; Terry Field, PhD[5]; Catherine McCarty, PhD, MPH[6]; Cynthia Nakasato, MD[2]; Douglas Roblin, PhD[2]; Christopher Anderson, MPH[1]; Rodolfo Valdez, PhD[7]

[1]HealthPartners; [2]Kaiser Permanente; [3]Harvard Medical School; [4]Kaiser Permanente Northwest; [5]University of Massachusetts Medical School; [6]Marshfield Clinic; [7]Centers for Disease Control and Prevention

Background and Aims: Little of what we know about the use of family history and genetic risk assessment services has been gathered from those engaged in counseling. To fill this gap, we conducted a survey to understand the processes of identifying and referring high-risk patients for genetic counseling and testing for familial cancer from the perspective of genetic service providers. **Methods:** Genetics professionals (genetic counselors and physician geneticists) from eight CRN sites were surveyed. The survey, administered via Survey Monkey, included questions regarding sources of referrals, steps to get an appointment, use of electronic medical records, perceived barriers to referral, strategies employed to improve identification and referral of high-risk patients, and ways to increase awareness among providers of the value of obtaining family history of cancer. Analyses involved computing frequencies of categorical responses and means of continuous responses (performed in SAS v9.1). **Results:** Of the 40 invited, twenty-eight individuals responded to the survey (70%). Referrals were predominantly from providers (89% on average) versus self-referrals (10% on average). Barriers that may prevent patients who are referred for counseling services from being seen included the following: genetic risk evaluation was not a priority for patients (72%, 18 of 25 responding to this item), concerns about insurance (52%, 13 of 25), distance to appointments (48%, 12 of 25), lack of patient and/or provider knowledge (36%, 9 of 25), discouragement by family members (28%, 7 of 25), and fear (20%, 5 of 25). Attending meetings was the most frequently (57%, 16 of 28) reported strategy to increase awareness among and referrals from providers. Provider education was mentioned most frequently (70%, 14 of 20 responding to this item) to improve understanding of the value of family history documentation and increasing referrals. **Conclusions:** Our survey identified several areas in the identification and referral process for cancer genetic services where opportunities for improvement exist including increasing awareness of the importance of genetic risk assessment among general practitioners, creating a simple standard for collecting genetic information and referring patients, and promoting the value of family history and the importance of determining genetic susceptibility, when appropriate, among patients and providers.

Keywords: Genetic risk assessments, Genetic counseling, Testing for familial cancer

doi:10.3121/cmr.2010.943.ps1-08

PS1-09:

Public Opinion of Family History and Genetic Testing for Common Diseases: Results from Focus Groups with Kaiser Permanente Colorado Members

Alanna Kulchak Rahm, MS; Kaiser Permanente Colorado

Background and Aims: With the advent of personalized medicine, consumers are routinely exposed to information about new gene discoveries, family history, and direct-to-consumer (DTC) advertising of genetic tests. Since 2008, the BRACAnalysis® test for breast cancer risk has been steadily advertised directly to consumers in different markets across the US, and at least 3 companies now offer DTC genetic screening for $300 - $1000, with more companies entering this burgeoning market. The specific aims of this project are to: 1) determine how individuals understand the issue of family history and DTC genetic tests, and 2) to determine how individual perspectives about issue salience and issue frames differ by population group.

Methods: As part of a CRN pilot project, focus groups were conducted with Kaiser Permanente Colorado members in 2009 to determine individual perspectives and public opinion about the importance and value of family history, DTC genetic testing, and DTC advertising and other media representations of DTC genetic tests. Focus groups were conducted by concordant population groups: General population KPCO members, members who self-identify as African American, members who self-identify as Hispanic/Latino, women with a recent referral for BRCA1/2 testing, KPCO primary care providers, and KPCO specialty care providers. **Results:** Results on focus group demographics, media use, trust in information, and most trusted information sources are presented. Additional results include coding focus group transcripts for value and polarity (positive/negative) of opinion on family history and genetic testing. Additional coding for how different population groups frame opinion on the issue (progressive, deterministic, caution) include results on whether frames are similar or different across population groups. Finally, information on the impact of media presentations on member opinion and decision-making were assessed. **Conclusions:** Individual opinions about the value of family history and genetic testing for disease risk vary greatly. Salience of themes related to genetic testing and DTC genetic tests specifically may vary across concordant population groups.

Keywords: Direct-to-consumer genetic testing, Health and family history, CRN pilot project

doi:10.3121/cmr.2010.943.ps1-09

PS1-10:

Response to Metformin and Genetic Variants of Organic Cation and Multidrug and Toxin Extrusion Transporters

Robert Davis, MD, MPH[1]; Kathleen Giacomini, PhD[2]; Sook Wah Yee, PhD[2]; Gerard Jenkins, MD[2]; Catherine McCarty, MPH, PhD[3]; Russell Wilke, MD, PhD[4]

[1]Kaiser Permanente Georgia; [2]University of California San Francisco; [3]Marshfield Clinic Research Foundation; [4]Medical College of Wisconsin

Background and Aims: Metformin is the most widely-used anti-diabetic drug in the United States. However, medication management fails to achieve therapeutic goals in ~20% of patients. This study attempted to identify genetic polymorphisms associated with metformin treatment failure. We studied the associations between polymorphisms in two liver and kidney organic cation transporter genes (OCT1 & OCT2) and two kidney multidrug and toxin extrusion transporter genes, (MATE1 & MATE2K) and response to metformin monotherapy. **Methods:** At Kaiser Permanente Southeast and Marshfield Clinic Research Foundation we identified 304 type 2 diabetes (T2DM) patients on metformin monotherapy who: were enrolled for >=6 months prior to initiation; remained on metformin >= 90 days following initiation; and had a HgbA1c measured prior to first metformin prescription and then after initiation. From this group we selected 171 patients who had not received metformin or other anti-diabetics previously, and had baseline HbA1c levels >7.0% prior to metformin initiation. We genotyped 10 SNPs, and assessed response by measuring absolute and relative change in HbA1c after after metformin initiation. **Results:** Three SNPs were identified that were significantly associated with reduced response to metformin, after adjustment for baseline HbA1c, dose, and ethnicity. In a dominant model, heterozygosity or homozygosity for minor A allele in the MATE1 intronic SNP, rs2289669, resulted in a smaller absolute change in HbA1c (mean of 0.45% less reduction in absolute change in HbA1c; 95% CI 0.17 to 0.74%) compared to individuals homozygous for major G allele. In a recessive model, homozygosity for minor A allele in MATE2K 5'-UTR SNP, rs12943590, resulted in smaller absolute change in HbA1c (mean of 0.43% less reduction in absolute change in HbA1c, 95% CI 0.053 to 0.86%). The reduced function SNPs in OCT1 & OCT2 were not associated with metformin response, except for rs34059508 (G465R). This SNP showed a positive (but not statistically significant) association with smaller absolute change in HbA1c (mean of 0.49%; 95% CI -0.06354 to 1.045%). **Conclusions:** These three variants of metformin transporter genes may be important for personalizing treatment for patients with T2DM. A replication study in a larger population is currently being planned.

Keywords: Genetic polymorphisms, Metformin transporter genes, Metformin treatment

doi:10.3121/cmr.2010.943.ps1-10

PS1-11:

Specimen Collection Within the Cancer Research Network: A Critical Appraisal

Mia Hemmes, MPH[1]; Catherine McCarty, PhD, MPH[2]; Heather Feigelson, PhD, MPH[3]; Joanna Bulkley, PhD[4]; Alanna Rahm, MS[3]; Lisa Temposky[5]; Mark Hornbrook, PhD[4]; Robert Davis, MD, MPH[1]; Katrina Goddard, PhD[4]

[1]Kaiser Permanente Georgia; [2]Marshfield Clinic Research Foundation; [3]Kaiser Permanente Colorado; [4]Kaiser Permanente Northwest; [5]Group Health Cooperative

Background and Aims: The Genomics Working Group (of the Cancer Research Network (CRN) Pharmacovigilance Project) explored single-site experiences with genomic studies to understand challenges and opportunities for collecting and using biological specimens. Its specific aims were to: (i) describe the availability of existing biospecimens; (ii) document successful past specimen collection strategies; (iii) identify potential barriers to selected recruitment strategies; and (iv) develop standardized study documents for future genomic research. **Methods:** We distributed a survey on existing biospecimen availability to principal investigators at all CRN Pharmacovigilance sites. Information collected included the number of specimens, storage methods, and type of specimens available. Investigators were also asked to identify past and current studies at their institutions in order to collect information on successful specimen collection strategies. A literature review was conducted both to identify potential barriers to participation and to understand the feasibility of various recruitment procedures. Benefits and limitations of 'opt-out' and 'opt-in' specimen collection methods were examined. Lastly, we developed study documents, including recruitment letters and informed consent forms, for future saliva and blood specimen collection efforts. **Results:** Two of the CRN HMOs currently have large-scale banked blood or saliva specimens (>20,000) within existing repositories. One site has two large-scale studies (>20,000 participants each) with banked specimens able to provide DNA for future research. Whole blood or blood components are the most commonly collected specimen types, and multiple CRN sites have access to banked tumor blocks. There were 33 past or current studies that included biospecimen collection. There was a trade-off between intensive data collection requirements and recruitment yield, cost, and participation burden. **Conclusions:** There is great potential for collection, storage, and use of biospecimen samples for research within the CRN. For future collection efforts, 'opt-out' models allow fast sample accrual, but impact data de-identification requirements. 'Opt-in' models allow for broad data collection, but are resource and time intensive. Pathology time and support may be a barrier to future use of stored samples.

Keywords: Genomics Working Group, Specimen collection strategies, Genomic research

doi:10.3121/cmr.2010.943.ps1-11

PS1-12:

Use of Tumor Registry to Obtain Family History Information

Pandora Ashley, CTR[1]; Sheila Dobin, PhD[1,2]

[1]Scott & White Memorial Hospital; [2]Texas A&M College of Medicine

Background: The Human Genome project has revolutionized the field of medicine to move toward personalized medicine. The family history is a screening tool to identify families at risk for common conditions allowing for personalized care. For breast cancer syndromes, genetic testing, counseling and prophylactic treatment are available. While there are data about the efficacy and clinical utility of the family history, there are areas that still need investigation. Does obtaining the family history lead to patient

recommendations? Do patients act on recommendations? Are there barriers to action and are there improved outcomes? One established barrier is the time to obtain a pedigree and knowledge basis for interpretation. Options for obtaining and interpreting a family history are necessary due to these barriers. We examined the use of tumor registry data as a cost effective option for providing family history, and age information. **Methods:** The tumor registry data were examined to identify women that were diagnosed with breast cancer between 2004-2008. These data were then substratified for age and family history. A family history was considered positive if it met the US Preventative Health Task Force criteria for breast cancer. The EMRX allowed identification of patients who had genetic counseling and or testing recommended and how many patients followed up on those recommendations. **Results:** Between 2004-2008 there were 1,594 patients with a newly diagnosed breast cancer. Of these, 113 had no information (7%). There were 1,112 (75%) that had at least one 1st or 2nd family member with a significant malignancy. There were 61 patients that met criteria for a positive family history. Fourteen patients were at or below age 50, and 47 over age 50. Of the 61 patients, 37 (60.7%) were offered genetic counseling and/or testing. **Conclusions:** The tumor registry data did identify individuals with a positive family history of breast cancer and was cost effective. In conjunction with the EMRX, it is possible to see if the appropriate recommendations were made and whether individuals followed the recommendations. These individuals present opportunities for future research in barriers to care, and biomarker research in individuals with a familial risk.

Keywords: Tumor Registry, Personalized medicine, Family history screening

doi:10.3121/cmr.2010.943.ps1-12

PS1-13:

Using the PMRP Cohort to Develop a Model for Incorporating Genetic and Environmental Factors into Prostate Cancer Screening Decisions

Deanna Cross, PhD[1]; Catherine McCarty, PhD, MPH[1];
Douglas Reding, MD, MPH[2]

[1]Marshfield Clinic Research Foundation; [2]Marshfield Clinic

Background: Prostate cancer screening with PSA has decreased the average age of prostate cancer detection and increased the number of men who undergo prostate biopsies. Currently two thirds of the prostate biopsies performed due to a high PSA test are negative for prostate cancer leading to unnecessary expense and distress for the individual. One way to decrease the unnecessary procedures associated with PSA screening would be to identify individuals who are either at increased or reduced risk of prostate cancer using newly discovered genetic and environmental risk factors. **Aims:** Using the males in the Personalized Medicine Research Project (PMRP) population that have had a PSA test, determine if genetic and environmental factors can be incorporated into the PSA screening model to better discriminate individuals who will have a diagnosis of prostate cancer from those with negative biopsies. **Methods:** Individuals in PMRP who were diagnosed with prostate cancer (N=466) were compared with the entire Marshfield Clinic population to determine cancer screening characteristics such as rate of PSA screening and average age at cancer diagnosis. All men in PMRP who have had a PSA test (N=4659) were genotyped for at least 12 polymorphisms that have been associated with prostate cancer in GWAS studies and dietary history was collected if available. **Results:** Individuals diagnosed with prostate cancer in the PMRP population tend to have more PSA tests prior to diagnosis than the general population (an average of 7) with 69% (N=320) having at least one PSA test prior to a prostate biopsy. A total of 935 of the 4659 men in the study have had a prostate biopsy with a positive biopsy rate of 34%. Using a panel of 12 previously identified polymorphisms; seven were significantly associated with prostate cancer in our population. Individuals with 1 or fewer risk alleles (15.6% of the population 146 of 935) were less likely to have a diagnosis of prostate cancer on biopsy (OR 1.6). **Conclusions:** The PMRP population that has experienced at least one PSA screen is a viable population for testing new screening algorithms that incorporate genetic and environmental factors for better identification of prostate cancer risk.

Keywords: Prostate cancer screening, PSA screening, Genetic and environmental risk factors

doi:10.3121/cmr.2010.943.ps1-13

PS1-14:

Utilization and Effectiveness of KRAS Testing for Colorectal Cancer

Heather Feigelson, PhD, MPH[1]; Katrina Goddard, PhD[2]; Alanna Kulchak Rahm, MS[3]; Pamala Pawloski, PharmD[4]; Catherine McCarty, PhD, MPH[5]; Adedayo Onitilo, MD[5]; Kushi Lawrence, ScD[6]; Robert Davis, MD, MPH[7]; Arnold Potosky, PhD[8]

[1]Kaiser Permanente; [2]Kaiser Permanente Northwest; [3]Kaiser Permanente Colorado; [4]HealthPartners Research Foundation; [5]Marshfield Clinic Research Foundation; [6]Kaiser Permanente Northern California; [7]Kaiser Permanente Georgia; [8]Georgetown University Medical Center

Background: New genomic and personalized medicine (GPM) applications have the potential to enhance our ability to screen for disease predisposition and treatment responsiveness. Surveying colorectal cancer (CRC) tissue for mutations in the KRAS gene is one such test that can help decide how to treat patients with metastatic colorectal cancer (mCRC). KRAS testing provides an opportunity for oncologists to tailor the use of anti-EGFR therapy to increase treatment effectiveness and potentially minimize adverse events. The FDA has recently changed the labeling of anti-EGFR therapies to indicate that it is not effective for the treatment of patients with KRAS mutations. KRAS testing has already become standard clinical practice in many settings. In this study, we will assess the patterns of diffusion and utilization of KRAS testing and evaluate the characteristics of patients, providers, and health systems as they relate to the uptake of KRAS testing. We will also conduct a comparative analysis of KRAS testing for mCRC patients treated in community practices to evaluate its effectiveness in terms of both progression-free survival and overall survival. **Methods:** This study will include a total of 800 mCRC cases diagnosed between January 1, 2005 and July 31, 2010 from 7 HMORN sites. Using electronic records at each site, we will capture information on relevant patient characteristics including disease characteristics, comorbidities, history of all cancer-directed therapies, acute complications, receipt of palliative care and contextual socioeconomic variables. We will use chart review to supplement, or in some cases verify, the electronic data. **Conclusion:** The study will serve as a model for evaluating the potential impact of GPM applications to improve health outcomes, reduce costs, and influence patient and physician decision-making in the area of personalized therapies.

Keywords: KRAS testing, Patient treatment, Genomic and personalized medicine applications

doi:10.3121/cmr.2010.943.ps1-14

Cancer

C-B2-01:

A Panel of Markers with Potential Clinical Diagnostic Application

Nava Nawaz, MD; Geisinger Health System

Background and Aims: Distinguishing low/intermediate grade neuroendocrine carcinoma (carcinoid and atypical carcinoid) from a high grade neuroendocrine carcinoma [small cell carcinoma and large cell neuroendocrine carcinoma (LCNEC)] of the lung can be difficult, especially in small biopsy specimens. Patients diagnosed with a low/intermediate grade carcinoma would be treated surgically white patients diagnosed with small cell carcinoma with chemotherapy. Biomarkers may increase the diagnostic accuracy. **Methods:** We studied 42 consecutive cases of neuroendocrine tumors of the lung (20 small cell carcinomas, 7 large cell neuroendocrine carcinomas, 12 carcinoids and 3 atypical carcinoids) with the objective of comparing the expression of the panel of biomarkers (CD117, KOC, Ki-67, pVHL and p16) between the low and high grade neuroendocrine tumors of the lung. Tissue microarrays were constructed and expression of each biomarker was evaluated using immunohistochemistry. Staining was standardized and scored as "0" = Negative, "1+" = Focal, "2+" = 30 -49% cells staining and "3+" = 50-100% cells staining positively. For the purpose of the present study, a specimen scored as "0" or "1+" was classified as negative, while a specimen scored as "2+" or "3+" was considered positive. In estimating the likelihood of expression of the biomarkers, specimens were

categorized into low grade and high grade. Two-sided non-parametric statistical analyses were performed using the SAS v. 9.3 (SAS Institute, Cary, NC). **Results:** Expression of KOC, p16, pVHL and Ki67 was significantly different between low and high grade tumor categories. No significant difference was observed for CD117. High grade tumors showed greater expression of Ki-67 (OR=13.85, 95% CI 3.34-57.47, p=0.0003), p16 (OR=3.52, 95% 1.75-7.11, p=0.0004) and KOC (OR=4.24, 95% CI 1.88-9.56, p=0.0005) while pVHL expression was less in high grade tumors (OR=0.31 95% CI 0.12-0.84, p=.022). We detected a statistically significant probability of joint overexpression of three of the biomarkers [p16 and KOC and Ki_67] in small cell carcinoma relative to atypical carcinoids (OR=2.53. 95% CI 1.24-5.17, p=.011). **Conclusions:** Findings from this pilot project suggest that Ki-67, KOC and p16 are an effective antibody panel in differentiating high grade neuroendocrine carcinoma from low/intermediate grade neuroendocrine carcinoma.

Keywords: Distinguishing grades of carcinoma, Biomarkers, Diagnostic accuracy

doi:10.3121/cmr.2010.943.c-b2-01

C-C3-01:

Adolescent and Young Adult Cancer Survivors in the Cancer Research Network

Ann Geiger, PhD[1]; Sarah Greene, MPH[2]; Andrea Altschuler, PhD[3]; Sharon Castellino, MD[1]; Stacy Month, MD[3]; Larissa Nekhlyudov, MD[4]; Ann Mertens, PhD[5]

[1]Wake Forest University School of Medicine; [2]Group Health Cooperative; [3]Kaiser Permanente Northern California; [4]Harvard Pilgrim Health Care; [5]Emory University

Background and Aims: Adolescents and young adults (AYA) with cancer face unique challenges related to their stage of physiological and psychosocial development, yet their diagnosis, treatment, and survivorship experiences remain poorly understood. To ascertain the CRN's potential to address these issues, we examined the characteristics of and available follow-up time among AYA diagnosed with cancer at two CRN sites. **Methods:** Using the CRN's Virtual Data Warehouse cancer registry files, we identified all individuals diagnosed with their first primary invasive cancer at ages 15 to 39 years from 1992 to 2007 at one site and 1996 to 2007 at the other. Next, we extracted demographic, vital status, and tumor data, categorizing tumor type using the combined childhood (ICCC) and adult (ICD-O3) classification approach from the SEER 2006 AYA cancer epidemiology report. We used administrative data to calculate post-cancer enrollment through September 2009. To address potential variations in enrollment patterns and pediatric to adult care transitions, we stratified the vital status and follow-up data into ages 15 to 24 years and 25 to 39 years. **Results:** We identified 7,121 AYA with incident cancer, of whom 4,424 (62%) were female and 2,820 (40%) were non-white. Common tumor types included breast (n=1,391, 20%); lymphoma (n=996, 14%); thyroid (n=858, 12%); genital (female, n=798, 11%; male, n=720, 10%); leukemia (n=327, 5%); and central nervous system (n=315, 4%). Among the 1,194 (17%) individuals diagnosed at ages 15 to 24 years, 955 (80%) were alive through the follow-up period; the median enrollment after diagnosis was 3.5 years (interquartile range [IQR] 1.5 to 6.6). Among the 5,927 (83%) individuals diagnosed at ages 25 to 39 years, 4,682 (79%) were alive through the follow-up period; the median enrollment after diagnosis was 4.2 years (IQR 1.7 to 8.0). **Conclusions:** Within two CRN sites we were able to identify a sizable, racially diverse group of AYA cancer survivors who remained enrolled and thus could be followed for several years after diagnosis. The CRN provides a unique setting in which to explore contemporary AYA cancer survivorship issues in the short-term, collect prospective long-term data, and test relevant interventions.

Keywords: Adolescent and young adult cancer, Survivorship, Cancer treatment and diagnosis

doi:10.3121/cmr.2010.943.c-c3-01

C-C3-02:

Ethnic Differences in Interval Diagnosed Breast Cancers in South Carolina

Emily Smith, MSPH, BS[1]; Swann Adams, PhD[2]; Jeanette Fulton, MD[3]; Kamala Swayampakala, MSPH[2]; Carri Clark-Sorenson, BSRT[4]; James Hebert, ScD[2]

[1]Scott & White Healthcare; [2]University of South Carolina; [3]Pitts Radiology; [4]Palmetto Health Richland

Background/Aims: The incidence of breast cancer (BrCA) among African-American (AA) women is lower than European-American (EA) women, yet their mortality rate is twice as high. Numerous hypotheses have been proposed to explain this disparity ranging from the biological to factors related to access to care. The relatively under-studied area of interval-diagnosed BrCAs, tumors which arise between regular mammograms and represent one of the most aggressive types of tumors, among AA women may represent such a biological factor. The goal of this investigation was to describe and compare detection patterns of BrCAs and their related histopathology among AA and EA women in South Carolina. **Methods:** A longitudinal file on 65,766 women was created with multiple clinic visits representing each mammography or diagnostic service performed and the final findings of these procedures. Women with a malignancy diagnosis were classified as cases provided they had an abnormal screening and were subsequently found to have histopathologically-confirmed malignancies. Interval cancers were defined as those that occurred between regular screenings of the American Cancer Society recommended 1-2 years. After electronic identification of the interval cancers, the actual mammography films from each interval cancer case were combined with a random sampling of negative and positive films and underwent a "blinded" review by a radiologist. Chi-square and t-tests were used to assess for differences between AA and EA women and between screen-detected and interval-detected malignancies. Polytomous regression was also employed to describe and compare patterns of BrCA detection among our cohort of women. **Results:** Among the study population, AA women were more likely to be younger than EA women. AA women were also more likely to have poorly differentiated tumors and to have interval-detected malignancies. Variables found to be significantly associated with interval cancers included age and marital status. Furthermore, AA women were found to be at a 1.8 times higher risk of interval-detected cancers than EA women. **Conclusions:** Taken as a whole, these results indicate that the characterization of interval-detected tumors among AA women may prove to be a promising avenue to help explain ethnic disparities in BrCA and offer an opportunity for medical intervention such as increased screening guidelines.

Keywords: Breast Cancer, Ethnic disparities, African American women

doi:10.3121/cmr.2010.943.c-c3-02

C-C3-03:

Indicators of Lifetime and Annual Mammography Screening in the Brazos Valley

Marcia Ory, PhD, MPH[1]; Matthew Smith, PhD, MPH[1]; Angela Hochhalter, PhD[1,2]; Alan Stevens, PhD[1,2]; Meghan Wernicke, MPH[1]

[1]Texas A&M Health Science Center; [2]Scott & White Healthcare

Background and Aims: Early detection and treatment of breast cancer is associated with reduced cancer mortality. While these preventive strategies are still seen as beneficial, new guidelines have recently been announced for the recommended timing of mammogram screenings for various age groups. This study examines patterns of mammogram use in 2006 and examines the relationship between demographic, health status, and healthcare access factors. **Method:** Survey instruments were mailed to a random sample of households in the seven county region of the Brazos Valley in Texas (n=1,935). Data were analyzed from a sample of 617 adult females age 40 and older. Study variables include: age groupings (i.e., 40-49, 50-74), education, race/ethnicity, residence rurality, self-reported health status, depression scale scores (5 items, a=0.802), having had a visit with a medical

provider in the previous 12 months, having had a lapse of insurance in the previous 3 years, and having had a mammogram in the previous 12 months. Associations were examined with Spearman correlation analyses. A logistic regression analysis was performed to identify variables associated with having had a mammogram in the previous 12 months. **Results:** Over ninety percent of respondents (91.2%; 563 of 617) self-reported having had a mammogram in their lifetime and 62.4% (385 of 617) reported having had a mammogram in the previous 12 months. Of the females who had a mammogram in the previous 12 months, 14.0% (24 of 171) reported having not visited a medical provider in the previous 12 months. Having received a mammogram in the previous year was significantly correlated with having more education (ρ =0.083, P<0.05) and not having a lapse in health insurance coverage over the previous 3 years (ρ=0.155, P<0.01). Having received a mammogram in the previous 12 months was significantly associated with having visited a medical provider in the previous 12 months (OR=28.352, P<0.001). **Conclusion:** Most women have had at least one mammogram, which suggests the successful dissemination of preventive cancer screening guidelines and minimal evidence of health disparities. Routine check-ups are the major driver for meeting prior mammogram recommendations, which emphasizes the importance of access to regular care when implementing the new screening guidelines.

Keywords: Breast cancer, Mammograms, Preventive cancer screening

doi:10.3121/cmr.2010.943.c-c3-03

C-C3-04:

Neighborhood Socioeconomic Conditions and Use of Preventive Health Care Services in Insured Populations

Chyke Doubeni, MD, MPH[1]; Scott Robinson, MA, MPH[2]; Hassan Fouayzi, MS[3]; Douglas Roblin, PhD[4]; Terry Field, DSC[3]; Robert Fletcher, MD, MSc[5]

[1]University of Massachusetts Medical School; [2]Lovelace Clinic Foundation; [3]Meyers Primary Care Institute; [4]Kaiser Permanente Georgia; [5]Harvard Medical School

Background and Aims: Several studies have found variations in cancer health outcomes among persons in different socioeconomic (SES) groups, but the presence and extent of such disparities in insured populations is unclear. The objective of this study was to determine whether, among persons enrolled in HMOs, there are differences in the use of services for early detection of cancer according to neighborhood SES. **Methods:** This was a retrospective cohort study of men and women aged 50+ years, enrolled for at least 1 calendar year beginning in 2000 at one of 3 health plans participating in the Cancer Research Network. Follow-up was to the date of disenrollment from the health plan, or December 31, 2007, whichever was earlier. Using administrative data, we obtained dates of examinations and tests related to screening for colorectal cancer (CRC) for men and women and mammography among women. CRC tests were defined as time to the first colonoscopy or sigmoidoscopy (endoscopy) during the follow-up period; and also time to an endoscopy that was not preceded by gastrointestinal conditions in the 6 months prior to the test. SES neighborhood measure was computed using 12 US Census (2000) measures of racial and SES composition and context at the tract level. **Results:** A total of 123,222 members, 54% women and average age 64 years, were followed for an average of 5.5 (SD=2.8) years. During 673,938 person-years of follow-up, about 41% had at least 1 endoscopy and 32% had an endoscopy not associated with prior GI-related diagnoses. Among women, 77% had at least 1 mammogram during the study period; 7% had mammograms during each of the first 5 years of follow-up. In Cox regression models, compared to lowest quartile of SES, persons residing in the highest quartile had a hazard ratio (HR) of 0.76: (95% confidence interval (CI): 0.75-0.78) for receipt of any endoscopy; 0.72: (CI: 0.70-0.74) for 'screening' endoscopy; and 0.86: (CI: 0.84-0.88) for mammography. **Conclusion:** Even among patients receiving care in HMOs, those in socioeconomically deprived neighborhoods are less likely to undergo cancer early detection services. Interventions targeting enrollees residing in lower SES neighborhoods may help reduce cancer health disparities.

Keywords: Cancer health outcomes, Socioeconomic status, Health disparities

doi:10.3121/cmr.2010.943.c-c3-04

PS3-07:

A Microsimulation Model of the Natural History of Smoking in the US

Simran Tiwana, MBA, PhD[1]; Michael Maciosek, PhD[1]; Thomas Flottemesch, PhD[1]; Leif Solberg, MD[1]; Nichol Edwards, MPH[1]

[1]HealthPartners Research Foundation

Background: Smoking and other forms of tobacco use is the largest preventable cause of morbidity and mortality in the US. An understanding of the natural history of this behavior can help in improving smoking cessation efforts. **Aim:** To develop a microsimulation model to depict the natural history of smoking in the US using data from the National Health Interview Survey (NHIS) and a structured literature review. **Methods:** Data from NHIS and the literature were used to model smoking prevalence by year of age over the lifetime of a birth cohort of US teenagers. The model accounted for age at initiation, quit attempts by age, success of quit attempts, and relapse. Smoking states in the model were "never smoker," "current smoker," "recent quitter," and "former smoker." Demographic variables such as age, gender and race/ethnicity were also analyzed to understand variations in smoking behavior by individual characteristics. Utilization of clinical interventions to promote cessation was built-in to the model in order to create two scenarios for use in evaluating the benefit of interventions to reduce smoking. In these two scenarios, lifetime smoking patterns in the absence and presence of clinical intervention were estimated. Use of these scenarios facilitated the comparison of smoking patterns with and without clinical intervention. The second scenario was also used to validate the model against observed prevalence rates and will facilitate future analyses of smoking patterns with selected community interventions incremental to current use of clinical interventions. **Results:** Model estimate of overall smoking prevalence of approximately 20% (for ages 18-65 years) was comparable to the available national estimates for the US. The model also successfully reproduced the smoking prevalence by age, gender and race/ethnicity, thus allowing for future analyses of various interventions at the clinic and at the community level. The model predicts a reduction of smoking prevalence by 4% at age 65, due to clinical interventions. **Conclusions:** Microsimulation modeling provides a useful framework for understanding smoking prevalence by individual variables such as age, gender and race/ethnicity. The current model will be expanded to include the impact of community interventions targeted at smoking reduction/cessation.

Keywords: Variables in smoking prevalence, Microsimulation modeling, Smoking cessation

doi:10.3121/cmr.2010.943.ps3-07

PS3-10:

Barriers to Screening Colonoscopy Differ Among Health Plan Member Groups

Jennifer Vincent, DO[1]; Angela Hochhalter, PhD[1,2]; Kristine Broglio, MS[1,2]; Andrejs Avots-Avotins, MD[1]

[1]Scott & White Healthcare; [2]Texas A&M HSC

Background/Aim: Colorectal cancer screening for average risk patients is recommended beginning at age 50, with screening colonoscopy every 10 years considered by many to be the gold standard for screening (USPSTF, 2008). The purpose of this study is to explore the differences in barriers to colonoscopy between men and women. **Methods:** A stratified random sample of Scott & White Health Plan members was drawn—1000 50-year-old men, 1000 50-year-old women, 1000 men aged 51-80, and 1000 women aged 51-80. Sampled members received surveys by mail requesting information about colonoscopy in the past 10 years, readiness to have colonoscopy in the next six months, demographic information, time since last primary care visit and barriers to colonoscopy for those who had not had the procedure in the past 10 years. We compared barriers to colonoscopy between males versus females by the chi-square test or Fisher's exact test. **Results:** Response rate was 31% (1234 of 4000). Over 35% of the sample (438/1234) reported not having a colonoscopy in the past 10 years. The most commonly reported barriers were "My regular doctor has not told me I need a

colonoscopy "(42%) followed by "I do not think I need the test" (21%). Males were more likely than females to report that they did not think they needed the test (p = 0.042) and that they could not take the time off of work (p = 0.025), and that they had a bad experience with colonoscopy (p = 0.027). **Conclusions:** Survey responses point to the important roles healthcare providers and approaches tailored to the barriers to specific groups can plan in intervention strategies.

Keywords: Colorectal cancer screening, Colonoscopy barriers, Intervention strategies

doi:10.3121/cmr.2010.943.ps3-10

PS3-12:

Obesity and Risk of Proliferative Hyperplastic Lesions

Melissa Stahl, MPH[1]; James Evans, MD, MPH[1]; Azadeh Stark, PhD[1]

[1]Geisinger Health System

Background and Aims: Obesity is a risk factor for breast cancer for postmenopausal women. Aromatization of androstenedione to estradiol in the peripheral adipose tissue and low levels of sex-hormone binding globulin as well as increased serum levels of insulin-like growth factors have been proposed as the underlying biological mechanisms. Women diagnosed with hyperplastic lesions with/without atypia have increased risk for a subsequent breast cancer. We conducted a retrospective study with the primary objective of assessing the association between body weight and the diagnosis of hyperplastic lesions. Our specific aims were: 1) to compare the prevalence of biopsies prior to the diagnosis of breast cancer and 2) to estimate the risk of hyperplastic lesions after adjusting for Body Mass Index (BMI), and other potential confounders. **Methods:** This case-series study benefits from an existing cohort of women (N= 882), ages 40 years and older, diagnosed with and treated for their first primary invasive breast cancer at the Geisinger Health System between 2001 and 2007. Data were obtained from Geisinger's electronic health record; the diagnosis atypical ductal hyperplasia (ADH) was the outcome of interest. Women were categorized according to their BMIs as normal, overweight or obese. All statistical tests were two-sided and analyses were performed using SAS version 9.3 (SAS Institute, Inc. Cary, NC). **Results:** The prevalence of biopsy prior to the diagnosis of breast cancer was not statistically different among the three groups of women. The risk of hyperplastic lesions was elevated for overweight (OR= 13.58; 95% CI= 1.03-178.84; P= 0.047) and obese (OR= 14.76; 95% CI= 1.09-200.09; P= 0.043) women relative to women in their ideal body weight. The association between BMI and other risk factors for breast cancer did not reach the level of statistical significance. **Conclusions:** Preliminary results suggest that excess body weight increases the risk of hyperplastic lesions in postmenopausal women. Biologically, this observed risk may be the result of higher serum levels of unbound estradiol in overweight and obese women. Future larger studies should validate our findings.

Keywords: Breast cancer, Obesity, Hyperplastic lesions

doi:10.3121/cmr.2010.943.ps3-12

PS3-13:

Patient Barriers to Mammography Identified During a Mammogram Reminder System

Adrianne Feldstein, MD, MS[1]; Nancy Perrin, PhD[1]; Ana Rosales, MS[1]; Jennifer Schneider, MPH[1]; Mary Rix, RN, BS, CCRC[1]; Russell Glasgow, PhD[2]

[1]Kaiser Permanente Northwest; [2]Kaiser Permanente, Colorado

Background/Aims: Patient mammogram reminders are effective at raising screening rates, but patient screening barriers remain. We evaluated patient characteristics available in electronic medical records that might be associated with mammogram completion after a reminder program, and identified patient-reported barriers that could help to explain response differences. **Design:** Retrospective cohort study using electronic medical record data and a sub-group patient survey. Setting/Participants: Participants were female Kaiser Permanente Northwest HMO members aged 50-69 who were 20 months past their last mammogram (index date) and who were the target of a reminder intervention (Total N=4,708). A mailed survey was completed by 336 of 665 (50.5%) members of the sub-group that received the survey. **Intervention:** "Mammogram due soon" post card 20 months after last mammogram, followed by a sequence of up to 2 automated phone calls and 1 live call for non-responders. Main outcome measure: Mammogram completion at 10 months following index date. **Results:** The characteristics associated with lower mammogram completion rates were age <60 (OR 0.69; p<0.0001); health plan membership <5 years (OR 0.81; p=0.019); family income <$40,000 per year (OR 0.77; p=.018); and obesity (OR 0.67; p<.0001). Nearly 47% of the cohort was obese. Among survey respondents, being "too busy" (OR 0.54; p=0.048), feeling "embarrassed" (OR 0.09; p=.001) and "too much pain" (OR 0.41; p<.001) were associated with lower likelihood of mammogram completion. Obese women were more likely to report "too much pain" from mammograms compared to non-obese women (31.3% of 160 vs.18.8% of 176; p<0.01). Younger women were more likely to endorse that they believed in preventive screening (84.4% vs. 71.6%; p <0.05), but also that they were "too busy" (19.1% vs. 6.4%; p<0.001) and had more worries about mammogram accuracy (2.5 vs. 2.3 on 5 point scale; p<0.05) than older women. Pain mediated the relationship between obesity and mammogram completion rates (indirect effect = -.111, 95% CI -.229 to -.025, p=.008). **Conclusions:** Important barriers to mammogram completion remain even with effective reminder systems. Obesity is an especially prominent barrier due to patients concerns about pain associated with mammography. Interventions to address/reduce pain may help lower this barrier.

Keywords: Mammogram screenings, Mammogram reminder system, Patient screening barriers

doi:10.3121/cmr.2010.943.ps3-13

PS3-14:

Primary Care Providers Reported Use of Pre-Screening Discussions for Prostate Cancer Screening: A Cross-Sectional Survey

Maggie Gunter, PhD[1]; Ann Von Worley, BA, RN[1]; Herbert Davis, PhD[1]; Shelley Carter, MPH, MCRP, RN[1]; Lawrence Scholl, MPH[2]; Jacqueline Miller, MD[3]

[1]LCF Research; [2]Macro International Inc.; [3]Centers for Disease Control and Prevention

Background and Aims: There is no scientific consensus for routine prostate cancer screening for men of average risk less than 75 years of age using the prostate-specific antigen test (PSA). However, suggested practice is for physicians to discuss the known harms and potential benefits of PSA testing and digital rectal exam (DRE) with their patients. We conducted a survey of primary care providers (PCPs) to determine their practice styles including discussion regarding prostate cancer screening; we also conducted a patient survey to learn whether their PCPs discussed PSA testing and DRE during a health maintenance exam (HME). **Methods:** PCPs in the Lovelace Health System were surveyed about their prostate cancer screening practices for average risk men. Based on their responses, they were divided into two groups: 1) routine screeners (RS), those who routinely order PSA testing without discussing potential harms and benefits and 2) informed decision makers (IDM), those who routinely discuss the PSA test and its benefits and harms. After the HME, patients were surveyed as to whether or not their PCP discussed the PSA test and its harms and benefits during their visit. **Results:** Among the physicians, 35.9% (23/64) were RS and 64.1% (41/64) were IDM. Of the RS patients, 82.3% (51/62) responded that their physician did discuss the PSA test compared to 71.2% (37/52) of the IDM patients (p=0.10). For RS, 58.8% (36/62) of the patients stated their provider initiated the discussion, whereas 56.8% (30/52) of the IDM initiated it. Provider recommendations to have the test were higher for the RS (80.3%) (41/51) compared to 53.1% (20/37) of the IDM p=.0032. **Conclusions:** By patient report, a higher percentage of RS providers discussed the PSA test with patients. As would be expected, most of the RS recommended the PSA compared to only one-third of the IDM providers. Further studies are needed to determine what other factors of physician practice styles relate to discussing or not discussing prostate cancer screening with patients, and how

patient-providers interactions influence screening communication.
Keywords: Prostate cancer screening, Physician communication, PSA testing

doi:10.3121/cmr.2010.943.ps3-14

PS3-16:

The Influence of Travel Time on Breast Cancer Diagnosis and Treatment

Tracy Onega, PhD[1]; Andrea Cook, PhD[2]; Beth Kirlin, BA[2]; Diana Buist, PhD, MPH[2]; Leah Tuzzio, MPH[2]

[1]Dartmouth Medical School; [2]Group Health Research Institute

Background and Aims: Longer travel time to health care services has been shown to be associated with more advanced stage at diagnosis and differences in surgical care for women with breast cancer. The influence of travel time on other disease characteristics at diagnosis and on use of other breast cancer treatments is not known. We examined travel time in relation to stage, nodal involvement, tumor size, primary and adjuvant treatments, and receipt of surveillance mammography to provide a more detailed examination of the role of travel time in access and utilization of breast cancer services to help further understand barriers to recommended care. **Methods:** Using an established cohort of women enrolled at Group Health, with an early stage breast cancer diagnosis from 1990-1999 (N=1306), we linked travel time estimates with tumor and treatment data. Travel time was estimated for each census block in Washington to the nearest radiology facility and was then attributed to women based on geocoded residence data. Tumor and treatment data were abstracted from chart review and from SEER data. We modeled bivariate relations between travel time and outcomes using log binomial generalized linear regression (glm). **Results:** Most women (90%) lived within 30 minutes of the nearest radiology facility. Travel time >45 min. was associated with a greater likelihood of mastectomy vs. breast conserving surgery (Referent group:travel time <10min: RR=1.48; 95%CI:1.03-2.13) and with use of adjuvant chemotherapy (RR=1.65; 95% CI:1.01-2.70). Travel time did not significantly influence stage at diagnosis, tumor size, radiation treatment, or receipt of surveillance mammography in the first two years following cancer treatment. **Conclusions:** In the Group Health population, travel time appears to differentially influence patterns of care for women with early stage breast cancer and does not appear to be related to tumor characteristics at diagnosis.
Keywords: Breast cancer diagnosis, Breast cancer treatment, Travel time and cancer

doi:10.3121/cmr.2010.943.ps3-16

PS3-18:

Use of Antidepressant and Anti-Anxiety Medications Among Breast Cancer Survivors in a HMO

Chantal Avila, MA[1]; Reina Haque, PhD, MPH[1]; Virginia Quinn, PhD, MPH[1]; Joanne Schottinger, MD[1]; Alice Fisher, BA[1]

[1]Kaiser Permanente Southern California

Background: Almost 200,000 U.S. women are diagnosed each year with breast cancer and over 40,000 women will die of the disease. In addition to the medical and functional consequences of the diagnosis and treatment, women experience worry, persistent anxiety, fear and depressive disorders. Overall, 30% of women diagnosed with breast cancer suffer significant distress at some point in their illness trajectory. National health organizations including the Institute of Medicine and National Cancer Institute call for treatment of common symptoms among breast cancer patients such as depression and anxiety. To date, there are only limited reports on the prevalence of treatment, and even fewer studies have examined potential differences by race/ethnicity, age, or tumor characteristics. **Aim:** To describe the prevalence of pharmacotherapy for depressive symptoms/anxiety among patients diagnosed with breast cancer in a large HMO. **Methods:** We identified all women diagnosed with primary breast cancer between 2000-2006 (n=10,408) who had been members of Kaiser Permanente Southern California (KPSC) for 1+ years prior to diagnosis. KPSC is a nonprofit comprehensive prepaid health plan serving 3.2 million socioeconomically diverse members. Data was obtained from the KPSC SEER-affiliated cancer registry and automated clinical, pharmacy, and membership databases. We examined patient and tumor characteristics associated with new use of pharmacotherapy for depression/anxiety. Univariate odds ratios (OR) and 95% confidence intervals (CI) were estimated using logistic regression. **Results:** We found 35% of women (3,611 of 10,408) were newly prescribed either anti-depressant or anti-anxiety medications within a year of breast cancer diagnosis. Younger women (e.g., OR=1.44, CI=1.28-1.63 for 40-49 year olds v. 60-69) and women with higher stage (e.g., OR=3.40, CI=2.87-4.04 for Stage 3 v. Stage 0) were more likely to be prescribed these medications, while African-American (OR=0.81, CI=0.72-0.92) and Asian-Pacific Islander (0.73, CI=0.64-0.84 women were less likely compared to non-Hispanic white women. **Conclusions:** While future research needs to determine the number of breast cancer survivors screened and diagnosed with depression/anxiety, results of pharmacotherapy utilization in this insured population are consistent with national reports of the prevalence of psychosocial distress experienced after breast cancer diagnosis. Potential age and race/ethnicity disparities are of concern and need further study.
Keywords: Breast cancer survivorship, Psychosocial distress, Pharmacotherapy

doi:10.3121/cmr.2010.943.ps3-18

PS3-19:

The Association Between Body Mass Index and Intestinal Stoma-Related Problems

Raymond Skeps, MS[1]; Lisa Herrinton, PhD[2]; Carmit McMullen, PhD[3]; Christopher Wendel, MS[4]; Joanna Bulkley, PhD[3]; Robert Krouse, MD[4]

[1]University of Arizona; [2]Kaiser Permanente Northern California; [3]Kaiser Permanente Northwest; [4]Southern Arizona Veterans Affairs Health Care System

Background: Colorectal cancer (CRC) survivors with an intestinal stoma (or ostomy) may have multiple problems related to their stoma. Some evidence suggests that weight change is linked to increased problems with an ostomy. Aim: To examine the association between BMI and stoma-related problems in a sample of long-term (>5 years post-diagnosis) CRC survivors that received an ostomy. **Methods:** Long-term CRC survivors from three regions of Kaiser Permanente (Northwest, Northern California, and Hawaii) completed a mailed survey. The response rate for respondents with an ostomy was 53% (283/529). The survey included questions about weight and height at time of surgery and at time of survey, stoma location, stoma-related problems, and time to complete daily stoma care. A gain or loss of BMI between time of surgery and survey was defined as change in BMI of 1.5 points or more. Differences in stoma-related problems were analyzed based on demographic and clinical characteristics. **Results:** Of the 268 patients with complete data 41.4% (111 of 268) had a stable BMI, 21.3% (57 of 268) had a decrease in BMI, and 37.3% (100 of 268) had an increase in BMI. Younger (<75 years) survivors were more likely to have problems with clothing caused by stoma location (23% vs. 13%, p=.04). The odds that the location of the stoma caused problems, except clothing issues, were two times greater among survivors whose BMI increased compared to survivors with stable BMI (OR=2.21, 95% CI 1.10-4.47). Moreover survivors with either a BMI increase or decrease were more likely to spend more than 30 minutes per day on stoma care than those with stable BMI (OR BMI increase=2.37, 95% CI 1.12-5.03; OR BMI decrease=2.67 95% CI 1.13-6.29). No significant differences in stoma-related problems were noted related to other demographic or clinical measures. **Conclusion:** Change in BMI is associated with stoma-related problems among long-term colorectal cancer survivors. CRC survivors with an intestinal stoma whose BMI changes may need to adapt equipment and care practices to changes in abdominal shape. Health-care providers should caution patients that significant changes in BMI may lead to stoma-related problems.
Keywords: Colorectal cancer, Intestinal stoma, BMI and intestinal stoma-related problems

doi:10.3121/cmr.2010.943.ps3-19

Research and System Changes/Shared Decision-Making

C-B3-01:

Medical Homes – Relation to Quality, Cost, and Patient Satisfaction

Leif Solberg, MD[1]; Stephen Asche, MA[1]; Thom Flottemesch, PhD[1]; Beth Averbeck, MD[2]; Nancy Salazar[2]; Patricia Fontaine, MD[3]

[1]HealthPartners Research Foundation; [2]HealthPartners Medical Group; [3]University of Minnesota

Background: Medical homes are widely viewed as a partial answer to the problems of inadequate care quality and patient experiences plus excessive healthcare costs, even though there is very limited evidence about whether they can affect these issues. We evaluated the relationship between degree of medical home-ness and measures of quality and patient satisfaction among 21 primary care clinics certified as level III medical homes by the National Committee for Quality Assurance (NCQA). **Methods:** We used the research version of the NCQA certification survey to measure the degree to which each clinic exemplified the medical home, with scores (0-100) overall as well as for each of five domains from the Chronic Care Model. These scores were then tested for associations with clinic-specific performance measures, cost data, and patient satisfaction. **Results:** Despite common NCQA level III attainment, we found considerable variance in scores among these clinics. Total and domain mean scores ranged from 58.6 to 81.8 with SD of 15.0-41.2 on medical home measures. Mean composite diabetes outcome rates ranged from 16.4-41.9%. Clinic-level correlations were highest for Delivery System Redesign and Healthcare Organization domains, and among the five specific components of the composite diabetes measure, blood pressure <130/80 was highest. Mean rate of "Definitely would recommend this office" was 83+5.6% with highest correlation with Decision Support. **Conclusions:** Even within the same medical group, individual clinics all certified as high level medical homes have substantial variance in care quality and patient satisfaction. Further analyses will be done for costs of care and for other performance measures and will adjust for patient factors in order to clarify how well aspects of the medical home that are assessed in the current certification process are associated with quality, cost, and satisfaction.

Keywords: Medical homes, Quality of medical home care, medical home assessments

doi:10.3121/cmr.2010.943.c-b3-01

C-B3-02:

Doctors' Role in Their Patient's Healing: Practices of the Highest Performing Physicians by Patient Survey

Tom Janisse, MD[1]; Elizabeth Sutherland, ND[2]; Nancy Vuckovic, PhD[3]; John Hsu, MD, MPH[1]; Karen Tallman, PhD[1]; Richard Frankel, PhD[4]

[1]Kaiser Permanente; [2]National College of Natural Medicine; [3]Intel; [4]University of Indiana School of Medicine

Background and Aims: The MD-Patient Communication Study aims were the best practice communication behaviors of physicians during outpatient clinic visits; and to collect physician perspectives of communication behaviors. Researchers have consistently found the top predictors of overall patient satisfaction are quality of the physician-patient relationship and contributing communications. There is limited understanding however, of the range of specific behaviors in the interaction associated with positive and negative patient perceptions and reactions. **Methods:** In phase 1, we conducted a naturalistic, observational study of fifty-five, Permanente Primary Care physician-patient visits using videotape recordings, and incorporating patient and physician reactions to the tape. The physicians, who practiced in Los Angeles and Honolulu, spanned the three strata of high, medium, and low historical patient satisfaction scores. In phase 2, a standardized six-question set was posed, in semi-structured, 60-minute interviews, to 77 of the highest-performing physicians on this patient survey, including: 20 of the highest performers (top 5%) from the LA and Honolulu groups; and 42 and 15, respectively, of the highest performing physicians in Portland and Oakland. These interviews were audio taped with permission, transcribed and coded for patterns. **Results:** This abstract addresses the 4th question: "What role do you feel you play in your patients' healing? Do you think you, as a doctor, contribute to your patients' healing through non-technical, non-physical, or non-scientific ways?" All physicians agreed but varied in their role. Representative quotes: "Giving people the confidence to go through something." "People feel better coming in and seeing/talking to you." "People realizing they have the power to heal themselves–their involvement is essential." "Our relationship: interpersonal connection is so powerful." "The art of medicine is the art of healing." These narratives provide deep, coherent learning about physicians' role in healing: relationship, education, empowerment, emotion, personal connection, hope. **Conclusions:** With primary care in crisis nationally, and specialists increasingly procedure-focused, understanding physicians' role in patients' healing, especially as it creates high patient satisfaction, is of great importance to sustaining the highest quality medical care and service.

Keywords: MD-Patient Communication Study, Communication behaviors of physicians, Physician-patient relationships

doi:10.3121/cmr.2010.943.c-b3-02

C-B3-03:

Development and Pilot Testing of Guidelines to Monitor High-Risk Medications in the Ambulatory Setting

Jennifer Tjia, MD, MSCE[1]; Terry Field, DSc[2]; Lawrence Garber, MD[3]; Marsha Raebel, PharmD[4]; Jennifer Donovan, PharmD[5]; Abir Kanaan, PharmD[5]; Shira Fischer, BA[1]; Shawn Gagne, BA[2]; Yanfang Zhao, MS[2]; Jackie Fuller, MPH[2]; Jerry Gurwitz, MD[2]

[1]University of Massachusetts Medical School; [2]Meyers Primary Care Institute; [3]Fallon Clinic; [4]Kaiser Permanente; [5]Massachusetts College of Pharmacy

Background: Inadequate laboratory monitoring of high-risk medications contributes to preventable adverse drug events. One barrier to appropriate monitoring is lack of standardized monitoring guidelines. The study aims were to develop guidelines to monitor high-risk medications and to assess the prevalence of laboratory testing for these medications in a multispecialty group practice. **Methods:** We developed guidelines for laboratory monitoring of high-risk medications as part of a patient safety intervention trial. An advisory committee of national experts and local leaders (clinicians, pharmacists, pharmacoepidemiologists, and patient safety experts) used a two-round, internet-based Delphi process to select guideline medications based on the importance of monitoring for efficacy, safety, and drug-drug interactions. Test frequency recommendations were developed by academic pharmacists based on literature review and local interdisciplinary consensus. To estimate the potential impact of the intervention, we determined the prevalence of high-risk drug dispensings and laboratory testing for guideline medications between January 1, 2008 and July 31, 2008. **Results:** Consensus on medications to include in the guidelines was achieved in two rounds. Final guidelines included 35 drugs/drug classes and 61 laboratory tests. The prevalence of monitoring ranged from <50% to >90%, with infrequently prescribed drugs having a lower prevalence of recommended testing. When more than one test was recommended for a selected medication, monitoring within a medication sometimes differed by > 50%. **Conclusions:** Even among drugs where there is general consensus that laboratory monitoring is important, prevalence of monitoring is highly variable. Further, infrequently prescribed medications are at higher risk for poor monitoring.

Keywords: High-Risk Medications, High-risk medication monitoring, Laboratory monitoring

doi:10.3121/cmr.2010.943.c-b3-03

C-B3-04:

Medication Adherence, Rehospitalization and ER Visits Following Hospitalization for Members of a Medicare Cost-Contract HMO

Angela Hochhalter, PhD[1,2]; Kristine Broglio, MS[1,3]; Karim Prasla, PharmD[4]; Linda Robinson, MA[4]

[1]Scott & White Healthcare; [2]Texas A&M HSC; [3]Texas A&M University; [4]Scott & White Health Plan

Background/Aim: Patient engagement in healthcare is potentially important for moderating risks for adverse events and rehospitalization during hospital-to-home transitions. However, little is known about whether patients' behaviors actually impact outcomes following hospital discharge. The aim of this study was to describe the impact of medication adherence on risk for rehospitalization and ER visits following hospitalization for Medicare beneficiaries enrolled in a Medicare cost contract HMO offered by Scott & White Health Plan. **Methods:** Claims data from June 2006 to June 2008 were selected for all SeniorCare patients who had at least one hospitalization during 2007. The first hospitalization of the year was considered the index hospitalization. Medication adherence in the six months prior to index hospitalization was estimated using the Medication Possession Ratio (MPR). Time to rehospitalization and time to ER visit were calculated from the index hospitalization date of discharge to the event date or last follow-up date. **Results:** The analysis included 3,729 members with at least one hospitalization during 2007. Median age was 78 (range 27 – 105) and 57% of those patients were female. The cumulative incidence of rehospitalization at 6 months was 12.2% (95% confidence interval = 11.1%, 13.4%). The cumulative incidence of ER visits at 6 months was 21.2% (95% Confidence Interval = 19.8%, 22.7%). Median MPR in the six months prior to the index hospitalization was 0.85 (range 0.01 – 1) with 62% of patients with MPRs representative of "high" adherence to prescribed medications. Medication adherence was not significantly associated with rehospitalization or ER visits following hospitalization. **Conclusion:** Most guidelines and interventions for care transitions following hospitalization emphasize the important role of patient or family health behaviors, including medication adherence. No evidence was found that supports the hypothesis that history of adherence to medications is associated with a reduced risk for rehospitalization or ER use. Prospective studies of patient health behaviors during hospital transitions are needed to better understand the impact of patient health behaviors during the time following hospitalization.

Keywords: Patient behaviors, Medication adherence, Patient care transitions

doi:10.3121/cmr.2010.943.c-b3-04

C-C4-01:

Functional Magnetic Resonance Imaging (fMRI) and Diffusion Tensor Imaging (DTI): An Efficient, Non-invasive Alternative to Conventional Pre-surgical Planning in Neurosurgery

Jennifer Robinson, PhD[1]; Batool Kirmani, MD[1]; Manjit Sanghera, PhD[1]; Jacqueline Phillips-Sabol, PhD[1]; Daniel Cruz, PsyD[1]; Charles Wright, MD[1]; Gerhard Friehs, MD, PhD[1]

[1]Scott & White Memorial Hospital

Background: Neurosurgical intervention often requires pre-surgical or intra-operative planning/mapping techniques that are invasive. For example, prior to temporal lobectomy for intractable epilepsy, patients often undergo a WADA test which involves anesthetizing one hemisphere of the brain at a time to localize memory and language functions. For other neurosurgical cases, electrophysiological intra-operative mapping of the cortex is often used during tumor resections proximal to eloquent cortex, or for localization of specific cortex (i.e., motor) when placing neurostimulators (e.g., for pain management). Less common, but emerging as a noninvasive planning tool, fMRI was designated in three CPT codes for pre-surgical planning purposes. Here, we examined the effectiveness of fMRI and DTI by comparing fMRI data to WADA test results (for epilepsy patients) and electrophysiological recordings (for tumor resections and motor cortex stimulator placement). We also examine the utility of DTI in the context of surgical intervention. **Methods:** We examined 8 intractable temporal lobe epilepsy (TLE) patients (5 males, 3 females; 6 left TLE, 2 right TLE) who underwent both WADA testing and fMRI language mapping for pre-surgical planning purposes, 1 tumor resection case in which the tumor was near the motor cortex and intra-operative electrophysiological mapping was employed, and 1 motor cortex neurostimulator case in which electrophysiological mapping was performed. All patients were enrolled in IRB-approved studies. FMRI data (language or motor) was obtained prior to surgical intervention and maps were used intra-operatively using BrainLab. **Results:** In all 8 epilepsy cases, language mapping data was concordant between fMRI and WADA test results. However, fMRI mapping allowed for discrete, focal localization of regions involved in language processes whereas WADA testing only delineated hemispheric dominance. In the tumor resection case, fMRI data was consistent with electrophysiological recordings obtained intra-operatively. Finally, fMRI data was used as the primary localization technique for the motor cortex neurostimulator, and confirmed with electrophysiological recordings. **Conclusions:** Here, we demonstrate the effectiveness of fMRI as a powerful pre-surgical planning tool that has the potential to replace invasive and costly conventional methods. FMRI maps can easily be uploaded and used intra-operatively during stereotactic neurosurgery for accurate localization of complex brain functions.

Keywords: Pre-surgical planning tools, Effectiveness of fMRI, Evaluation of WADA test

doi:10.3121/cmr.2010.943.c-c4-01

C-C4-03:

Teen Tobacco Use and Depression in Primary Care

Virginia P. Quinn, PhD, MPH[1]; Lisa S. Meredith, PhD[2]; Su-Jau Yang, MS[1]; Lisa H. Jaycox, PhD[2]; Ellenie D. Tuazon, MPH[1]; M. Audrey Burnam, PhD[2]

[1]Kaiser Permanente Southern California, Pasadena, CA; [2]RAND Corporation, Santa Monica, CA

Background/Aims: Tobacco use is the number one cause of preventable morbidity and death in the nation. Despite the ever growing list of harmful effects associated with smoking, tobacco use is common among children and adolescents and approximately half who try smoking will progress to regular use and dependence. Of concern, the great progress achieved between 1997 and 2003 in reducing teen smoking has stalled with overall rates near 20%. There is only limited evidence of the effectiveness of smoking cessation interventions in teen populations, and the low probability that adolescents will stop smoking on their own highlights the importance of prevention and early detection. Depressive disorders occur in approximately one in five youth by age 18 and are associated with a broad range of negative effects on health, as well as academic and social functioning. **Methods:** We examined the association of smoking and depression in a large, diverse population of teens seeking primary care from 7 health care organizations in Los Angeles and Washington, D.C. Subjects and their parents were recruited from January, 2005 through March, 2006 to participate in the Teen Depression Awareness Project (TDAP). Among the 4722 teens eligible and interested in participation, 4529 completed a structured telephone interview which assessed depression using the Diagnostic Interview Schedule for Children and queried smoking status. **Results:** Smoking prevalence varied significantly among teens who scored "non-depressed," "sub-threshold depressed," and "depressed" (3.2%, 9.3%, and 15%, respectively). Multivariable analyses controlling for gender, race/ethnicity, age, BMI percentile, and health care site found that compared with non-depressed teens, teens with sub-threshold depression were almost three times as likely to smoke (OR=2.9, CI=1.6, 5.2) and depressed teens were more than 5 times as likely to smoke (OR=5.4, CI=3.4,8.7). Among teens who smoked, 25% suffered depressive symptoms. **Conclusions:** Primary care visits represent an important opportunity to identify teens at risk for and from depression and smoking. Effective treatments for smoking and depression need to address the co-occurrence and interaction of these serious threats to adolescent health.

Keywords: Teen tobacco usage, Smoking cessation in teen populations, Teen smoking and depression

doi:10.3121/cmr.2010.943.c-c4-03

PS3-21:

Making the Most of Your Healthcare Appointments Intervention for Older Adults

Angela Hochhalter, PhD[1,2]; Jennifer Rush, BS[1]; Lisa Sklar, DO[1]; Juhee Song, PhD[1]; Alan Stevens, PhD[1,2]

[1]Scott & White Healthcare; [2]Texas A&M HSC

Background and Aim: Active engagement in healthcare can foster healthy behaviors and promote health, especially among older adults dealing with the complexities of managing comorbid chronic illnesses. This study tested the efficacy of an intervention for increasing patient engagement and improving health-related quality of life among older adults with multiple chronic illnesses. **Method:** The intervention, Making the Most of Your Healthcare, uses evidence-based behavior change techniques to deliver publicly available patient education materials. We report the results of a three-group randomized controlled study conducted in a primary care setting. Seventy-nine participants were assigned to the intervention group, an attention control group, or usual care. The intervention and attention control groups attended a two-hour workshop and participated in two phone calls; one before and one after a naturally-occurring medical encounter. The intervention group's contacts were on patient engagement and the attention control group contacts were on general safety. Self-report measures were gathered by telephone interviews at baseline and six-months following baseline. **Results:** Differences were not found for patient activation, self-reported health or unhealthy days in the past month. The treatment group showed improved self-efficacy for self-management following intervention. **Conclusions:** Contrary to expectations, patient activation scores improved for both the treatment and usual care groups but not the attention control group. These initial findings suggest potential benefits for short-term, low-intensity patient engagement interventions. The intervention can be refined based on participant feedback. Additional testing is required to determine whether changed in patient activation with a refined intervention are possible.

Keywords: Patient engagement, Patient appointment interventions, Healthy patient behaviors

doi:10.3121/cmr.2010.943.ps3-21

PS3-22:

Medical Homes: A Comparison of the Factors that Predict Utilization across the Lifespan

Karon Phillips, PhD, MPH; Scott & White Memorial Hospital

Background: Not having access to a regular source of health care has been noted as one of the main contributors to the existence of health care disparities among ethnic minority populations (Lurie & Dubowitz, 2007). Utilizing a medical home has been proposed as a method to aid in the elimination of health disparities. A medical home is defined as a health care practitioner or facility that a person regularly utilizes for their primary care. Hispanics are less likely than whites to have a regular doctor that they had visited in the past year and African Americans are more likely than whites to visit the emergency room for non-urgent care (Doty & Holmgen, 2006). It is these conditions that brought about the rise of the medical home model. **Aim:** To examine several demographic and health-related variables that can have a significant impact on whether or not younger and older adults have medical homes. **Methods:** The data for this study came from the 2001 Health Care Quality Survey, conducted by the Commonwealth Fund. The respondents were 6,299 adults ages 18 to 99 that responded to the telephone survey. For this analysis, the respondents were divided into the following two age groups in order to compare outcomes by age: 18-49 and 50 and older. **Results:** The older people in the 18 to 49 age group were more likely to have medical homes. Female younger adults were more likely to have a medical home. Younger Non-Hispanic Whites were less likely to have a medical home. Married older adults were more likely to have a medical home. Younger adults with more education and higher incomes were more likely to have a medical home. Having health insurance and more health conditions were both significant predictors of having a medical home for both age groups. **Conclusions:** The demographic factors that predicted whether or not a client had a medical home varied by age group, but there were some common factors. Being able to afford health care increases the likelihood of having a medical home. Racial/ethnic minorities are not less likely to have a medical home.

Keywords: Medical home model, Medical home utilization, Demographic health disparities

doi:10.3121/cmr.2010.943.ps3-22

PS3-23:

Osteoporosis Treatment in a Home Health Care Population

Cheri Rolnick, PhD, MPH[1]; Julie Switzer, MD[2]; Jody Jackson, RN, BSN[1]; Nicole Schneider, BA[1]; Jeanne Dutkowski, MS, C-ANP[2]; Denise Edgett, PHN[1]

[1]HealthPartners; [2]Regions Hospital

Background and Aims: Only a small proportion of home health care patients at risk for fracture receive appropriate treatment. Patients with more comorbidities are least likely to receive treatment. The purpose of this study was to examine osteoporosis prevention and treatment among home health care (HHC) patients at risk for fragility fracture. **Methods:** All patients who received HealthPartners Integrated Home Care services in 2006 were identified. ICD-9 diagnosis codes & pharmaceutical data were examined between 1/1/04-12/31/05 to determine risk status (high vs. average). Patients with a diagnosis of osteoporosis, osteopenia, or Vitamin D deficiency, a history of previous fragility fracture, stroke or those taking a glucocorticoid (at least two orders) were categorized as high risk. Pharmaceutical data (e.g., estrogen, bisphosphonates) was obtained during the same two-year period to determine treatment status. Descriptive statistics were used to document proportion at high risk, with each risk factor and proportion of high risk receiving treatment. Inferential statistics (Pearson's chi square, Fischer's exact test) tested differences in characteristics (age, gender, race, number of comorbidities) among high risk patients with and without treatment. **Results:** A total of 2798 patients were in HHC during this timeframe. Of these, 754 were high risk and 2044 average risk. Approximately one-third (34%, 259 of 754) of high risk patients received osteoporosis medication compared to 4% (85 of 2044) of average risk ($p<0.0001$). We found no treatment differences based on age. Those with higher comorbidity profiles were less likely to receive treatment (28% or 121 of 435 vs. 72% or 314 of 435, $p<0.0001$). **Conclusions:** Only a small proportion of home health care patients at risk for fracture received adequate treatment. Patients with more comorbidities were least likely to receive treatment. The home health environment presents a good context in which an intervention to improve the quality of care for those at risk for fracture can be accomplished. Since the individuals identified are receiving medical and nursing care within an integrated healthcare delivery system, an opportunity exists to develop a program to increase treatment rates for those at greatest risk.

Keywords: Osteoporosis prevention, Fragility fracture in home health care, Patient fragility risk factors

doi:10.3121/cmr.2010.943.ps3-23

PS3-24:

Promoting Innovations in Quality Improvement: Lessons from a Medicaid Health Plan

Clarissa Hsu, PhD[1]; Maggie Jones, MPH[1]

[1]Group Health Research Institute, Center for Community Health and Evaluation, Seattle, WA

Background/Aim: Concerns about the quality of care delivered in the U.S. health care system gained national momentum with the release of the Institute of Medicine's reports To Err is Human: Building a Safer Health System and Crossing the Quality Chasm, which revealed that patients were not receiving the quality or level of care that they needed and called for fundamental change to the health care system. To address this need, health plans across the country have used varying approaches to support quality improvement (QI)—pay-for-performance (P4P) being the most commonly used and discussed approach. However, P4P programs also have many

challenges in design and execution, particularly for Medicaid providers. In order to find an alternative that overcame the challenges of P4P, CareOregon—a non-profit health plan serving Medicaid and Medicare enrollees in Oregon—developed the Care Support and System Innovation (CSSI) Program. An evaluation was conducted to assess the overall impact of the CSSI program in promoting comprehensive improvements in quality of care among network providers and the extent to which it offers a viable alternative to P4P. **Methods:** Data were collected from the 48 medical practices that participated in the CSSI Program between 2005 and 2007. Data collection strategies included site visits, telephone interviews, document review and a web-based survey. Qualitative data were coded and analyzed using a grounded theory approach, emphasizing identification of themes judged meaningful to the study subjects. Quantitative data were analyzed through the use of descriptive statistics and chi-squared analysis. **Results:** The evaluation found that the CSSI Program successfully addressed many challenges inherent in P4P. The CSSI Program successfully engaged providers, fostered a culture of quality improvement within its provider network, and provided practices with the opportunity to develop sustainable and innovative solutions to address quality concerns. Success of the program was attributed to CareOregon's focus on building relationships while providing technical assistance and responsive funding. **Conclusions:** The CSSI Program has provided valuable support for improving quality of health care delivery and encouraged innovation among participating providers. The model provides a viable alternative for overcoming many of the challenges faced by pay-for-performance and other quality improvement programs.

Keywords: Quality of health care delivery, Care Support and System Innovation Program, Quality improvement assessments

doi:10.3121/cmr.2010.943.ps3-24

PS3-25:

Raising Literacy and Capacity for Incontinence and Skin Care in Dementia: Needs Assessment of Family/Friend Caregivers and Healthcare Providers

Jody Jackson, RN, BSN[1]; Donna Bliss, PhD, RN[2]; Cheri Rolnick, PhD, MPH[1]; Kenneth Hepburn, PhD[3]; Casey Arntson[2]

[1]HealthPartners; [2]University of Minnesota; [3]Emory University

Background and Aims: Incontinence can occur in Alzheimer's disease or dementia (AD). Skin damage is frequently a physical complication. Few AD support programs directly address these problems. The purpose of this study is to assess and better meet the needs of informal caregivers and healthcare providers of persons with AD about issues of incontinence and perineal skin care. **Methods:** Audiotaped focus groups or interviews are being conducted with informal (family/friend) caregivers (goal n=56) and healthcare providers including physicians and nurse practitioners (NPs) (goal n=10) to determine needs for raising literacy and care capacity related to incontinence and skin damage. This assessment addresses health literacy content (e.g., knowledge, skills) as well as attitudes and preferred methods of receiving content. Results of this assessment, review of literature of current evidence and recommendations by expert clinical consultants will guide development of an informational and supportive intervention. **Results:** To date, 30 informal caregivers have participated in discussions (mean age 60; 75% female; 50% of care recipients are incontinent). A total of 11 healthcare providers participated in discussions (8 MDs, 2 NPs, 1 Pharmacist; mean age 53; 64% female; mean years of professional experience 23). Literacy needs of informal caregivers include prevalence and reasons why incontinence occurs in AD, when to discuss with healthcare provider and terms to use, types and photos of skin damage that can occur, indications for various absorbent and skin care products, and "step by step" instructions on ways to manage. Literacy needs of providers include evidenced-based recommendations for non-pharmacological management strategies, terms used by families and patients to refer to incontinence, referral or follow-up visit with specialist nurse, and utilization of provider (primary care, geriatrics) who has established relationship with patient. Preferred methods of learning/dissemination for both caregivers and providers include informational brochure, FAQ sheet, and guide to skin care products. Few preferred computer-based materials. **Conclusions:** Family/friend caregivers and healthcare providers of individuals with AD have indicated health literacy needs related to incontinence and associated skin damage and have identified preferred ways of addressing these needs.

Keywords: Incontinence and perineal skin care, Health literacy, Caregivers and health providers

doi:10.3121/cmr.2010.943.ps3-25

PS3-26:

Reasons for Not Achieving Optimal Secondary Prevention Care for Coronary Artery Disease

Thomas Kottke, MD, MSPH[1]; James Smith, MD[2]

[1]HealthPartners Research Foundation; [2]HealthPartners Medical Group

Background and Aims: Adherence to four secondary prevention goals (not using tobacco, LDL measured and <100 mg/dl within one year, blood pressure <140/90 at last visit, and daily aspirin) significantly improves outcomes for patients with coronary artery disease (ICD 9 410-414). However, a significant proportion of patients fail to achieve these four goals. We wished to determine the reasons why patients with CAD failed to achieve care goals in our multispecialty medical group. **Methods:** We abstracted 170 randomly-selected records of patients with CAD who failed to achieve care goals. **Results:** The two most frequent reasons for failure to achieve care goals were: the care team overlooked care needs at the time of an acute care visit (n=98), and the patient failed to return for follow-up (n=28). Other less frequent reasons were: The patient was offered treatment but declined (n=14); the clinician changed a medication in response to a value that was out of range, and the patient was not yet due for follow-up (n=10); and, the patient was not invited back for follow-up (n=9). The following reasons were observed in only one case each: Co-morbid conditions did not justify aggressive goals; the ordering physician failed to follow-up on a completed test; and, the patient was intolerant of statins. Eight patients failed to meet the optimal CAD care goal for other unique reasons. **Conclusion:** Providing clinical care teams with the tools to better track patient care needs (e.g., electronic patient identification and follow-up systems) could significantly reduce secondary prevention care gaps in our medical group.

Keywords: Coronary Artery Disease, Patient care outcome goals, Secondary prevention care

doi:10.3121/cmr.2010.943.ps3-26

PS3-28:

Telemedicine Specialty Consultation in a Medically Underserved Community

Ted Palen, PhD, MD, MSPH[1]; Mike Bodily, MBA[2]

[1]Colorado Permanente Medical Group; [2]Kaiser Permanente Health Plan of Colorado

Background and Aims: During the current national health care reform discussions, health information technologies (HIT) are receiving a lot of attention as means of lowering health care costs, improving access to health care, reducing errors during the delivery of healthcare, and improving health outcomes. Patients in rural or medically underserved areas find it difficult to obtain and maintain adequate access to health care. Telemedicine (TM) services can exchange video and audio information between healthcare providers and patients in different locations. For individuals in rural communities TM may improve access to care through the use of novel care delivery models. We are conducting a proof of concept (POC) study to evaluate the use of TM consultation between a primary care clinic in a medically underserved region of southern Colorado and a specialty care (endocrinology) clinic in Denver. **Methods:** This is a prospective health services POC study. We are taking advantage of a "natural experiment," the expansion of primary care services into a medically underserved area of southern Colorado, to examine the requirements for establishing TM services between a rural primary care clinic and metropolitan based specialists. **Results:** Technical requirements included establishing network capabilities (512 kbps ISDN, H.320), 2 Mbps IP (H.323 or SIP), wirelss LAN connection,

encryption embedded transmissions (H.235 and IEEE 802.1 x authentication); and remote monitoring equipment (exam camera, ENT/otoscope, electronic digital audio stethoscope (frequency: 40 Hz-2000 Hz, response: 45 Hz-1.6 KHz). Legal requirements involved the review of both federal and state statutes governing the use of TM for patient care and geographical/population requirements. Billing and regulatory requirements entail ensuring the use of the correct CPT and modifiers codes for TM and making sure these are operational within the medical record. Establishing criteria to ensure patients are appropriate for TM, the contents for TM informed consent, rules governing the use of TM for Medicare/Medicaid and non-Medicare/Medicaid patients. Establish clinical workflows for TM between the primary care and specialty care clinics. **Conclusions:** Invovle legal counsel early to review state statutes and develop TM patient/provider consent forms. Coordinate services with IT department. Coordinate documentation requirements with the billing and coding department. Work with clinic staff to incorporate TM into the clinic and admnistrative workflow. Define roles and responsibilites. Early planning and inter-department coordination is essential for a successful TM project.

Keywords: Telemedicine services, Medically underserved communities, Improving access to care

doi:10.3121/cmr.2010.943.ps3-28

PS3-29:

The Benefits of Stakeholder Involvement in Research

Kathryn Horner, MS[1]; Ed Wagner, MD, MPH[1]; Erin Aiello Bowles, MPH[1]; Beth Kirlin, BA[1]; Leah Tuzzio, MPH[1]

[1]Group Health Cooperative

Background and Aims: The Oncology Nurse Navigator randomized clinical trial at Group Health is testing whether providing oncology "nurse navigators" to patients newly diagnosed with lung, breast or colorectal cancer affects quality of life and satisfaction with care compared with patients in enhanced usual care. While implementing our research interventions, we integrated input from patients, community groups and the delivery system. **Methods:** Group Health patients and community groups were invited to participate through word-of-mouth outreach by the study team. Our delivery system partners were distributed materials for input via e-mail, phone calls and team meetings. To date, stakeholders have been involved in three main activities. First, our enhanced usual care resource guide was developed after a panel discussion with Group Health patients, caregivers and a community advisor. Second, our nurse navigator training incorporated firsthand patient experiences. Third, our intervention protocols and processes were constructed from input with our oncology department and nurse navigator team. **Results:** Patients and caregivers provided valuable insights and practical feedback while developing our study's enhanced usual care resource guide. Their involvement revealed the importance of making materials feel accessible and upbeat. We have since presented the guide to Group Health's cancer support group who commented they were, "Perfect!" The initial panel discussion was so useful that we invited stakeholders to participate in our nurse navigator training. Patients shared their experiences about feeling overwhelmed and unable to process information during a training session. The involvement of Group Health patients was especially enlightening for our seasoned nurses and emphasized the patient-centered design of our study. Since it is important for our nurse navigator intervention to be a viable delivery system program, input from clinical groups was integral to our protocols and processes. We have not only incorporated standard Group Health work into our intervention (e.g., fatigue assessment) but also, programmed our intervention into Group Health's electronic medical record. **Conclusions:** Stakeholders were willing and often eager to provide feedback on our research. Furthermore, obtaining guidance from these groups early on in this study was critical to building and implementing a truly patient-centered cancer care program.

Keywords: Nurse navigators, Patient-centered cancer care program, Patient navigation

doi:10.3121/cmr.2010.943.ps3-29

PS3-30:

The Group Health Plain Language Network: A System-wide Initiative to Improve Communication from the Ground Up

Jessica Ridpath, BA[1]; Sarah Greene, MPH[1]

[1]Group Health Research Institute

Background/Aims: Limited health literacy negatively impacts health care costs, quality, and outcomes. Complex language and other communication barriers prevent 93 million U.S. adults from finding, understanding, and acting on essential health information—leading to medication and treatment errors, failure to seek preventive care or manage chronic illness effectively, increased use of emergency rooms for primary care, and higher health care costs. The Group Health Plain Language Network is a staff-driven initiative to reduce these barriers by establishing a standard of clear communication with patients throughout the system. **Methods:** The Group Health Plain Language Network was founded in 2007 by a small group of multidisciplinary staff interested in system-level communication improvements to advance health literacy. The Network's overarching strategy is promotion of plain language—a concise, patient-centered communication style that achieves clarity through common vocabulary and straightforward organization. Network leaders set annual goals tied to organizational priorities and emerging health literacy innovations. We also meet at least quarterly to monitor projects carried out by subgroups of the now 30+-member coalition. **Results:** Network membership tripled in just two years, thanks to successful engagement of dozens of individuals and departments in a leadership-endorsed plain language initiative. Primary outcomes include: creating a plain language charter and securing executive-level buy-in; developing an online plain language toolkit for all staff; providing plain language training for subgroups of staff; revising dozens of print and Web-based health education materials; and partnering with the Group Health legal department to revise consent templates for medical procedures—many of which went from >15th-grade reading level to <7th grade. Formal evaluation of improvements to consent templates is planned for 2010. **Conclusions:** The Network's many accomplishments have occurred without allocating additional resources—demonstrating that system-level communication improvements are possible even when resources are scarce. We attribute the Network's early success to our focus on a solution-oriented approach that facilitates wide-ranging buy-in: plain language clearly aligns with other organizational goals, cuts across system silos, and engages staff who may not otherwise feel connected to or see the impact of low health literacy. We hope our experience can serve as a helpful example for other health systems striving to advance health literacy through improved communication.

Keywords: Health literacy, Communication within Health systems, Group Health Plain Language Network

doi:10.3121/cmr.2010.943.ps3-30

Cardiovascular

C-B4-01:

Cognitive Impairment in Patients Hospitalized for Decompensated Heart Failure

Jane Saczynski, PhD[1]; Darleen Lessard, MS[2]; Jerry Gurwitz, MD[1]; Catherine Emery, RN[2]; Frederick Spencer, MD[3]; Robert Goldberg, PhD[2]

[1]Meyers Primary Care Institute; [2]University of Massachusetts Medical School; [3]McMaster University

Background/Aims: Cognitive impairment (CI) is increasingly being recognized as an important clinical issue in the context of providing care to older adults with other prevalent medical conditions, including cardiovascular disease. The purpose of this study was to describe the prevalence of CI among older adults hospitalized with decompensated HF, and examine factors associated with cognitive status. **Methods:** Preliminary data from the Observational Study of Heart Failure Delays are currently available from 277 patients (mean age = 76 years; 46% female) who received care in four area hospitals. Patients were interviewed using a 25-minute standardized

questionnaire within 72 hours of hospital admission to obtain information regarding occurrence and timing of HF symptoms, care seeking behavior, and general knowledge of HF. Cognitive function in 3 sub-domains was assessed using standardized measures of memory, processing speed, and executive function. Cognitive impairment, defined using established norms, was calculated separately for each sub-domain. **Results:** One half of patients (51%, 141 of 277) had impaired processing speed, 42% (117 of 277) had impaired memory, and 65% (180 of 277) had impaired executive function. Approximately one third of patients (32%, 89 of 277) were impaired on only 1 domain, one third (34%, 95 of 277) were impaired in 2 of 3 domains and one fifth (19%, 53 of 277) were impaired on all 3 domains. Only 14% (40 of 277) had no evidence of CI. Patients with a high degree of CI (those impaired in multiple domains) were older, more likely to have less than a high school education, and were more likely to have a history of HF compared to patients with less CI (all p's <0.01). Patients with a high degree of CI also had significantly lower overall knowledge of the signs, symptoms, and self-management activities associated with HF ($p<0.05$). **Conclusions:** These preliminary data suggest that most patients hospitalized for decompensated HF are cognitively impaired. Cognitively impaired patients with HF may have poorer knowledge of the signs and symptoms associated with an exacerbation of HF as well as poorer knowledge of self-management techniques which may lead to poorer care seeking practices and long-term outcomes.

Keywords: Cognitive impairment, Decompensated Heart Failure, Care for older adults

doi:10.3121/cmr.2010.943.c-b4-01

C-B4-02:

Determining Genetic Risk Factors for Post- Hospitalization development of Deep-Vein Thrombosis

Deanna Cross, PhD[1]; Mark Craven, PhD[2]; Steven Yale, MD[3]

[1]Marshfield Clinic Research Foundation; [2]University of Wisconsin-Madison; [3]Marshfield Clinic

Background: Venothromboembolism (VTE) including deep venous thrombosis (DVT) and pulmonary embolism (PE) are significant health care problems. A highly specific DVT risk stratification model requires a combination of genetic, environmental, clinical, laboratory and radiographic measurements. Genetic factors associated with DVT in post-hospitalized medical and surgical patients are incompletely understood. **Aim:** Using the Personalized Medicine Research Project (PMRP) population and a limited number of disease associated polymorphisms were used to determine whether these markers were associated with DVT in the post-hospitlalization period. **Methods:** Marshfield Clinic patients who have experienced a DVT between 1999 and 2007 enrolled in the PMRP were genotyped for 52 disease associated polymorphisms (N=1124). From these individuals we identified 451 who experienced a DVT after post-hospitalization for a medical (N=164) or surgical (N=136) procedure or both (N=151). This cohort was compared to the PMRP population that had a recorded hospitalization without a post-hospitalization DVT during the same time period (N=1662). **Results:** Polymorphisms in APOB (rs1042031), PLAU (rs2227564), HTR2A (rs6313) and the Vitamin D receptor haplotype (rs731236 and rs7975232) were associated with post hospitalization DVT. When the population that incurred a DVT was stratified by DVT category (post medical, post surgical or both), the PLAU polymorphism was most strongly associated with individuals experiencing a DVT post-surgically. Vitamin D receptor haplotype was significantly associated with individuals experiencing both post medical and post surgical DVTs, and polymorphisms associated with cholesterol and lipid levels were most likely to be associated with post-medical DVTs. **Conclusions:** This hypothesis generating study demonstrates that there are many polymorphisms that are associated with DVT that have yet to be characterized. Categorization of associated DVT polymorphisms will involve careful interrogation of both the environmental conditions as well as genetic alleles of individuals. Genes such as PLAU, HTR2A, and Vitamin D are just now being investigated for thrombogenic effects and in future may lead to a better understanding of indentifying the individuals at risk for a DVT post hospitilization.

Keywords: Deep Venous Thrombosis, Post medical deep venous thrombosis, Deep venous thrombosis post-hospitalization

doi:10.3121/cmr.2010.943.c-b4-02

C-B4-04:

Underuse of Aspirin in Women for Primary and Secondary Prevention of Cardiovascular Disease Events

Cathleen Rivera, MD, MS[1]; Catherine McNeal, MD, PhD[1]; Juhee Song, PhD[1]; Joji Varghese, MD[1]; Marcia Ory, PhD, MPH[2]

[1]Scott and White; [2]Texas A&M Health Science Center

Background and Aims: Cardiovascular disease (CVD) is the leading cause of death among women. Consistent with studies documenting that aspirin (ASA) use decreases the risk of CVD events in certain groups, the American Heart Association (AHA) published specific evidence based guidelines for ASA use in women. This paper evaluates the self-reported use of ASA among women and examined characteristics of those most likely to be adhering to clinical guidelines. **Methods:** Data from 127 healthcare centers across the U.S. using a commercial, web-based CVD risk assessment tool (HeartAware™) were analyzed. Volunteer respondents answered questions about their CVD risk factors, the presence or absence of coronary, cerebral, peripheral arterial disease, diabetes, and medication use including daily ASA. Individuals who, based on the AHA 2007 guidelines should be taking ASA (for primary and secondary prevention) were included in the analysis. Univariate and multivariate logistic regression analyses were performed to identify factors significantly associated with ASA intake. **Results:** Of the 21,199 women who should be on ASA based on guideline information, only 42% reported the use for primary prevention and 68% for secondary prevention. Multivariate regression analysis found that African Americans (OR = 0.61, 95% CI 0.53-0.70, $p<0.0001$) and Hispanics (OR = 0.67, 95% CI 0.53-0.83, $p=0.0004$) were less likely than Caucasians to be taking ASA. Other factors that contributed significantly ($p<0.001$) to ASA use were a relationship with a PCP or cardiologist, taking blood pressure medications, past history of smoking, a family history of heart disease, and a family history of high cholesterol. **Conclusions:** Findings from a large cross-sectional cohort revealed that 58% of women who should be taking ASA for primary prevention and 32% of women who should be taking ASA for secondary prevention of CVD events were not following national guidelines. Individuals from racial/ethnic minorities were less likely to be taking ASA compared with Caucasians suggesting targets for intervention. These findings emphasize the need for ASA education among clinicians to provide guidance for targeting educational efforts that can improve CVD outcomes in women.

Keywords: Cardiovascular disease in women, Aspirin use, Cardiovascular disease outcomes

doi:10.3121/cmr.2010.943.c-b4-04

PS1-02:

Factors Associated with Medication Adherence and Emergency Room Visits in the Brazos Valley

Matthew Smith, PhD, MPH[1]; Marcia Ory, PhD, MPH[1]; Angela Hochhalter, PhD[1,2]; Alan Stevens, PhD[1,2]; SangNam Ahn, PhD, MPSA[1]

[1]Texas A&M Health Science Center; [2]Scott & White Healthcare

Background and Aims: Medication nonadherence has been linked to poor cardiovascular health outcomes and increased healthcare utilization and costs. While studies examine medication pill counts, less is known about intentional adjustments in medication use due to economic factors. The purpose of this study is to examine factors affecting economically-driven medication nonadherence and the role of cardiovascular risk factors and disease in explaining emergency room (ER) use. **Methods:** In 2006, survey instruments were mailed to a random sample of households in the seven county Brazos Valley region of Texas (n=1,935). Data were analyzed from a sample of 578 adults age 50 years and older. Study variables include: age

(50-64 compared to 65 years and older), sex, education, race/ethnicity, residence rurality, body mass index, presence of cardiovascular risk factors, perceived access to care, medication adherence scores based on economic factors (6 items, a=0.77), and having visited the ER within the previous 12 months. Two independent logistic regression analyses were performed to identify variables associated with medication nonadherence and the frequency of ER visits. **Results:** Over half of respondents (54.8%; 317 of 578) self-reported having cardiovascular disease (CVD) risk factors and 14.5% (84 of 578) reported having a cardiovascular incident. Medication nonadherence was reported by 25.3% (146 of 578) of respondents and 20.1% (116 of 578) reported having visited the ER in the previous 12 months. Medication nonadherence was associated with being younger (OR=0.431, P<0.001), having cardiovascular disease risk factors (OR=1.756, P<0.001), and perceiving less access to healthcare (OR=0.715, P<0.001). Visiting an ER in the previous 12 months was associated with having risk factors for cardiovascular disease (OR=1.441, P<0.05). **Conclusion:** Medication nonadherence associated with economic constraints remains a problem for a small but significant group of community residing adults, which emphasizes a need for greater surveillance by the healthcare system. Even before the full implementation of Medicare Part D, persons age 65 years and older tended to adhere to medication regimens. The significance of CVD in this Medicare-eligible group as a predictor of ER visits suggests that additional self-management support and training are needed to recognize and address signs of disease exacerbation.

Keywords: Medication adherence, Healthcare utilization, Economic factors and medication use

doi:10.3121/cmr.2010.943.ps1-02

PS1-03:

Health Behaviors in Adults with Risk Factors for Cardiovascular Disease

Katie Heinrich, PhD[1]; Jay Maddock, PhD[1]

[1]University of Hawaii

Background/Aims: Health behaviors of adults with cardiovascular disease (CVD) risk factors impact risk. We compared health behaviors of adults with diabetes, hypertension, high cholesterol, and obesity to those without. **Methods:** We conducted 30-minute random-digit-dial household telephone surveys in 2007 (n=3607). Over 92% of adults willing to answer questions completed surveys, representing their household. Protective behaviors included meeting fruit and vegetable (FV) recommendations (5+ servings/day), reporting "often/always" eating healthy diets, consuming low/very low dietary fat, eating breakfast 6-7 days/week, meeting walking and moderate physical activity (PA) recommendations (>=30 minutes 5+ days/week), and meeting vigorous PA recommendations (>=20 minutes 3+ days/week). Harmful behaviors included drinking soda >=once/week, drinking >=12ounces of soda at a time, and eating at fast food restaurants >=once/week. **Results:** Respondents included Whites (36.5%), Asians (28.5%), Hawaiians/part-Hawaiians (17.0%), female (65.3%), married (59.1%), college educated (54.7%), and mean age 54 (sd=15.8). CVD risk factors included obesity (18.5%), high cholesterol (16.4%), hypertension (15.9%), and diabetes (6.2%; 62.6% of those had Type II). For health behaviors, obese participants were less likely to obtain all seven protective health behaviors; they were more likely to engage in all three harmful nutrition behaviors. Participants with high cholesterol were less likely to do three protective behaviors, but also less likely to eat fast food. Participants with hypertension were less likely to do five protective behaviors. Diabetics were less likely to do three protective behaviors, but were also less likely to drink soda. Logistic regression indicated that obese participants were 1.69 times less likely to eat a healthy diet, a low fat diet (OR=1.61), or meet walking recommendations (OR=2.19), and were 4.02 times more likely to eat at fast food restaurants. Those with high cholesterol were 1.98 times less likely to meet FV recommendations, have a low-fat diet (OR=2.21), or meet vigorous PA (OR=1.64); but were 3.90 times more likely to eat breakfast and avoid fast food (OR=1.9). Those with hypertension were 2.17 times less likely to eat a healthy diet or meet vigorous PA (OR=1.66), but were also 2.01 times less likely to drink soda. Diabetes were 1.66 times less likely to eat a healthy diet or meet vigorous PA (OR=1.83). **Conclusions:** Individuals with CVD risk factors reported worse health behaviors, especially those with obesity. Healthcare interventions should monitor disease progression while reducing harmful and increasing protective health behaviors in individuals at greatest CVD risk.

Keywords: Cardiovascular disease, Adult health behaviors, Cardiovascular disease risk factors

doi:10.3121/cmr.2010.943.ps1-03

PS1-04:

Home Blood Pressure Telemonitoring and Case Management to Control Hypertension: HyperLink Trial Design and Baseline Characteristics

Karen Margolis, MD, MPH[1]; Tessa Kerby, BA[1]; Stephen Asche, MA[1]; Susan Cooper, PharmD[1]; Linda Loes, MD[1]; Michael Maciosek, PhD[1]; Peter Meyers, BS[1]; Nicole Schneider, BA[1]; JoAnn Sperl-Hillen, MD[1]; Patrick O'Connor, MD, MPH[1]

[1]HealthPartners

Background/Aims: Blood pressure (BP) is not controlled in the majority of people with hypertension (HTN) in the U.S. We describe a study of long-term hypertension outcomes that compares home BP telemonitoring and pharmacist case management vs. usual care. **Methods:** HyperLink is a cluster-randomized trial (N=450 patients) being conducted at HealthPartners Medical Group clinics. Sixteen clinics were randomly assigned to either the Telemonitoring Intervention (TI) or Usual Care (UC). Recruitment materials are mailed to adult primary care patients in these clinics whose last 2 BP measurements were uncontrolled in the previous 12 months (>140/90, or >130/80 if diabetes or kidney disease present). To be eligible, they are required to have uncontrolled BP confirmed at a research clinic visit. Other medical exclusion criteria are minimal: pregnancy, recent cardiovascular events, symptomatic heart failure, stage 4/5 kidney disease, and dementia. Participants in the TI group receive a home BP telemonitor that stores and transmits all BP measurements to the clinic pharmacist via a modem to a secure web site. Following one intake clinic visit with the pharmacist, participants and pharmacists communicate by telephone every 2-4 weeks for 6 months. HTN treatment is adjusted based on home BP according to an approved written protocol under a collaborative practice agreement with physicians. UC participants may visit a clinic pharmacist but do not receive telemonitoring. The primary outcome is BP control measured at the research clinic visit at 6 months. Secondary outcomes are BP control maintenance at 12 and 18 months, satisfaction and costs. **Results:** Recruitment began March 1, 2009, and is on track to be completed as predicted in September 2010. During the first 8 mo, 195 participants were recruited, of whom 47% were female, 17% were minority race/ethnicity and 53% were from TI clinics. Detailed baseline characteristics of participants recruited as of February 28, 2010 will be reported. **Conclusions:** Meaningful and sustained improvement in hypertension control will likely require fundamental changes in the current physician-centered office-visit based model of caring for hypertension. This novel intervention could be implemented widely in diverse and large patient populations based on performance in this randomized trial.

Keywords: Blood pressure control, Hypertension outcomes, Telemonitoring and blood pressure

doi:10.3121/cmr.2010.943.ps1-04

PS1-05:

Hyperglycemia Stimulates Intracellular Renin Expression in Both Cardiac Myocytes and Fibroblasts: Implications for Diabetic Cardiomyopathy

Vivek Singh, PhD[1]; Sunil Naik, MD[2]; Kenneth Baker, MD, PhD[1]; Rajesh Kumar, PhD[1]

[1]Texas A&M Health Science Center, College of Medicine; [2]Scott & White Memorial Hospital

Background / Aim: The upregulation of the renin-angiotensin system (RAS) represents a major pathological mechanism in diabetes. We have previously

reported that hyperglycemia preferentially increases intracellular generation of angiotensin (Ang) II. However, circulating RAS is down regulated in diabetes implying the accelerated intracellular RAS mechanism as a major contributor to diabetic cardiomyopathy. In this study, we determined expression of RAS components and their effect on cardiac cells to give us a venue to intervene. **Methods:** Diabetes was induced in Sprague-Dawley rats and C57/BL6J mice with injection of streptozotocin for 5 days and verified by sustained blood glucose levels >15 mmol/L. Control mice received buffered saline alone. One week after diabetes induction the mice hearts were removed and perfused by the Langendorff method. Myocytes were isolated with enzymatic dispersion and centrifugation. RAS proteins were determined by real-time PCR and Western analysis. These included angiotensinogen, renin, angiotensin converting enzyme, AT1, AT2, and ACE 2. Angiotensin II was purified by reverse-phase chromatography and quantified by competitive ELISA. **Results:** Among cells obtained from diabetic hearts, expression of AGT (3.5+/- 0.8 fold), renin (2.4 +/- 0.4), and AT1 (2.6+/- 0.3) was significantly increased compared to cells from control hearts ($p<0.05$, ANOVA). No significant change in the gene expression of ACE (1.2+/- 0.4), ACE2 (0.97+/- 0.2), and AT2 (1.2+/- 0.2), was observed. Increased expression at the protein level for AGT (2.2 +/- 0.1), renin (1.9 +/- 0.08), and AT1 (2.3+/- 0.2) was also observed by Western analysis. No significant changes in the protein levels of AT2, ACE, and ACE2 were observed. AngII levels in cardiac myocytes were determined by quantitative ELISA, which demonstrated significantly enhanced levels of AngII (140+/- 10 fmol/mg protein) synthesis in diabetic mice compared to controls (20 +/- 10 fmol/mg protein). **Conclusions:** This study suggests that local activation of the RAS in diabetes has a significant role in the development of cardiac dysfunction. Demonstration of renin expression in cardiac myocytes and enhanced expression in diabetic conditions represent a particularly significant finding. The latter suggests that locally produced, not circulating renin has a major role in cardiac Ang II generation and subsequent cardiomyopathy.

Keywords: Renin-angiotensin system, Diabetes, Cardiac dysfunction

doi:10.3121/cmr.2010.943.ps1-05

PS1-06:

The Impact of Treatment Intensification and Medication Adherence in Achieving Blood Pressure Control Among Coronary Artery Disease Patients

Colleen Ross, MS[1]; Thomas Maddox, MD[2]; Ella Lyons, MS[1]; Heather Tavel, BS[1]; David Magid, MD, MPH[1]

[1]Kaiser Permanente Colorado; [2]Denver VA Medical Center

Background and Aims: Among coronary artery disease (CAD) patients, control of hypertension reduces rates of myocardial infarction and mortality. Yet, BP control among CAD patients remains sub-optimal in clinical practice. Few prior studies have had the longitudinal data necessary to assess the role of treatment intensification and medication adherence in achieving optimal control. **Methods:** In this retrospective cohort study, we evaluated baseline and 1-year BP control rates among 15,102 HTN patients with an incident diagnosis of CAD between January 1, 2003 and December 31, 2006. Among those patients with sub-optimal baseline BP control, we assessed the contribution of treatment intensification and medication adherence to achieving 1-year BP control. Sub-optimal BP control was defined as systolic BP =140 mmHg and/or diastolic BP =90 mmHg (for those with diabetes or renal disease, sub-optimal control was defined as SBP =130mmHg and/or DBP =80mmHg). Treatment intensification was defined as an increase in BP medication dosage, the addition of another BP medication, and/or a switch of medication that resulted in a higher bioequivalent dose. Medication adherence was calculated using the proportion of days covered by medication prescription, and defined as a PDC > 80%. Logistic regression was used to determine the contribution of treatment intensification and medication adherence on achieving 1-year BP control, adjusting for baseline patient variables. **Results:** At the time of CAD diagnosis, 9,513 (65%) had sub-optimal BP control. At 1 year, 3,628(38%) of these subjects achieved BP control. Treatment intensification occurred more often among those patients who achieved 1-year BP control than those who did not (54% vs. 42%, p-value <0.0001). Medication adherence was similar between patients who achieved 1-year BP control and those who did not (87% vs.86%, p-value 0.10) during the year post-CAD. In adjusted analyses, treatment intensification was significantly associated with 1 year BP control (OR 1.42 95%CI 1.39, 1.45). In contrast, medication adherence was not significantly associated with 1 year BP control (OR 1.02, 95%CI 0.87, 1.16). **Conclusions:** Treatment intensification, but not medication adherence, was significantly associated with 1-year BP control among a newly diagnosed CAD population. Interventions to improve treatment intensification may improve BP control and patient outcomes.

Keywords: Blood pressure, Treatment intensification, Medication adherence

doi:10.3121/cmr.2010.943.ps1-06

Diabetes and Obesity

C-C2-02:

The High Five for Kids Study: An Intervention to Improve Primary Care to Prevent Childhood Obesity

Elsie Taveras, MD[1]; Steven Gortmaker, PhD[2]; Ken Kleinman, ScD[1]; Kathy Mitchell, MD[3]; Sarah Price, MPH[1]; Lisa Prosser, PhD[4]; Sheryl Rifas-Shiman, MPH[1]; Matthew Gillman, MD[1]

[1]Harvard Pilgrim Health Care Institute; [2]Harvard School of Public Health; [3]Harvard Vanguard Medical Associates; [4]University of Michigan Health System

Background and Aims: The preschool age group is ripe for clinically-based obesity prevention interventions. **Objective:** To assess the extent to which a primary care-based obesity prevention intervention (Ix), compared with the usual care control condition (UC), resulted in a smaller age-associated increase in body mass index (BMI) and improvement in specified obesity-related behaviors over the first year of a planned 2-year intervention. **Methods:** High Five for Kids is a cluster-randomized controlled trial in 10 primary care pediatric offices in Massachusetts. We randomly assigned 5 practices to the Ix condition and 5 to UC. Eligible children were age 2.0 - 6.9 years at baseline with BMI > 95th percentile or 85th-<95th percentile if at least one parent was overweight. The major components of the intervention were restructuring primary care based on the Chronic Care Model, stage-based motivational counseling by nurse practitioners, and stage-matched educational modules targeting TV, fast food, and sugar sweetened beverages. We enrolled 486 participants of whom 459 (94%) had primary outcomes measured at 1 year. We used intention-to-treat analysis, adjusted for baseline socio-demographic characteristics and corrected for clustering. **Results:** Mean (SD) age of participants was 4.9 (1.2) years; 29% had an annual household income < $50K; 57% were white, 20% black, 16% Hispanic. Compared with UC, Ix participants had slightly smaller change in mean BMI from baseline to 1 year (-0.18 kg/m2; 95% CI: -0.44, 0.08). Ix participants decreased their TV viewing (-0.41 hrs/day; 95% CI: -0.68, -0.13) and fast food intake (-0.17 servings/week; 95% CI: -0.34, 0.00) more than UC, but there was no effect on sugar sweetened beverage intake (-0.20 servings/day; 95% CI: -0.51, 0.11). In post-hoc stratified analyses, the intervention had a greater effect on BMI change among participants living in households with incomes <$50K (-0.79 kg/m2; 95% CI: -1.45, -0.13) than in higher income households (0.01 kg/m2; 95% CI: -0.34, 0.36). **Conclusions:** After a 1-year intervention period, High Five for Kids was effective in reducing TV viewing and fast food intake but did not significantly reduce BMI.

Keywords: Obesity prevention, Obesity-related behaviors, Obesity interventions

doi:10.3121/cmr.2010.943.c-c2-02

C-C2-03:

The Risk for Diabetes Mellitus Among Women with Gestational Diabetes: A Population-Based Study in Israel

Gabriel Chodick, PhD, MHA[1]; Uri Elchalal, MD[2]; Tal Sela, MD[1]; Anthony Heymann, MD[1]; Varda Shalev, MD[1]

[1]Maccabi Healthcare Services; [2]Hadassah Medical Center

Background and Aims: to determine the incidence of postpartum diabetes mellitus (DM) in the years following a diagnosis of gestational diabetes (GDM) and to determine whether severity of GDM is associated with developing diabetes. **Methods:** a retrospective cohort study was performed among 185,340 pregnant women who had glucose challenge test (OGCT) or 3-h oral glucose tolerance test (OGTT) in a large HMO in Israel. Subsequent diagnosis of diabetes was ascertained by using an automated DM registry. **Results:** a total of 11,259 subjects were diagnosed as suffering from GDM comprising 6.07% of the cohort. During a total follow-up period of 946,978 Person-Years there were 1065 (1.74 per 100 Person-Years) and 1118 (0.12 per 100 Person-Years) diagnoses of postpartum DM among GDM and non-GDM women, respectively. After 10 years of follow-up, 16% of the GDM population developed diabetes mellitus, compared with 1% among the non-GDM population. GDM was associated with an 8-fold higher risk of postpartum DM after adjusting for important confounder such as socioeconomic status and BMI. Among women with GDM history, diabetes risk increased with number of abnormal OGCT values and among women with Type A2 GDM. **Conclusions:** GDM, and particularly severe GDM, are important predictors of future development of DM.

Keywords: Postpartum diabetes mellitus, Gestational diabetes, Development of diabetes among women

doi:10.3121/cmr.2010.943.c-c2-03

PS2-15:

Coding for Obesity in a Health Plan Claims Database

Michael Shainline, BA, MS, MBA[1]; Shelley Carter, BA, MPH[1]; Ann Von Worley, RN[1]; Margaret Gunter, PhD[1]

[1]LCF Research

Background and Aims: The Centers for Disease Control estimated the obesity rate in New Mexico for 2008 to be 25.2%. Sources estimate the following associations between obesity and type 2 diabetes (80%); cardiovascular disease (70%); hypertension (26 %). Yet obesity is infrequently coded as a secondary diagnosis among providers submitting claims. This study examines the frequency with which obesity is documented on claims forms, the relationship between age, gender, and obesity coding, and the relationship between obesity coding and healthcare utilization. **Methods:** Lovelace Health Plan (LHP) claims for calendar year 2008 were queried to identify a diagnosis of obesity documented with an ICD-9 code. Of 4,559,975 claims, 559,672 (12.3%), were for individuals who had a secondary diagnosis of obesity. Outpatient, inpatient, emergency, and total claims per patient were compared for patients with and without a diagnosis of obesity by age and gender. A comparison of major diagnostic categories taken from primary diagnoses for patients with and without coded obesity was also made. **Results:** Mean annual claims for patients coded for obesity equaled $10,983, compared to $5,924 for patients not coded for obesity. For males coded for obesity, the mean annual claims paid were $12,165, compared to $10,409 for females. The figures increased as the age of the patient increased for both patients coded and not coded for obesity. For three major diagnostic categories Endocrine, Metabolic Diseases, (OR=2.5), Skin Diseases (2.0), and Circulatory Diseases (2.0), the odds of having a claim submitted for patients coded for obesity were at least double. **Conclusions:** The prevalence of patients coded for obesity in LHP claims is far lower than the estimated prevalence in New Mexico. Obesity is associated with greater utilization of health care. The odds of patients being coded for obesity are at least double for endocrine, skin, and circulatory diseases. This study describes an association that is assumed to be causative, since obesity is preventable and reversible. However, further studies need to be conducted to determine accuracy of coding. Perhaps incentives for providers to code for obesity should be considered.

Keywords: Obesity coding, Healthcare utilization, Accuracy of coding

doi:10.3121/cmr.2010.943.ps2-15

PS2-17:

Diabetes Social Support Feasibility Pilot Study: Utilizing Mobile Technology and Self-Identified Supporters to Enhance Self-Monitoring of Blood Glucose

Brandi Robinson, MPH[1]; Douglas Roblin, PhD[1]; James Hipkens, MD, PhD[2]; Suma Vupputuri, PhD, MPH[3]; Kevin McMahon[4]

[1]Kaiser Permanente Georgia; [2]The Southeast Permanente Medical Group, Inc.; [3]Kaiser Permanente; [4]Diabetech

Background and Aims: Self-monitoring of blood glucose (SMBG) is associated with improved glycemic control among patients with type 2 diabetes, however, the practice of daily self-monitoring is not optimal. Telecommunications technology may improve adherence to recommended self-management practices by remotely transmitting automated reminders to motivate patients, and utilizing social networking for peer support. The purpose of this pilot study is to demonstrate the feasibility and usability of mobile technology and the potential added value of social support to improve SMBG frequency and glycemic control among adults with type 2 diabetes. **Methods:** Adults 25-74 years of age with type 2 DM and an average HbA1c > 8.0% were recruited from Kaiser Permanente Georgia (KPGA) and Oakhurst Medical Center (OMC, a community health clinic) to participate in a 3-month study using wireless technology. Enrollment sessions with presentations on SMBG techniques, use of the wireless technology, and motivational coaching to enhance social support were conducted in November 2009. During the subsequent 3-months, both diabetes patients and their self-selected supporters will receive text messages to their cell phones summarizing a patient's SMBG frequency and levels. Participants and their supporters will attend a disenrollment session in February 2010 when feasibility and usability will be assessed in focus groups. **Results:** 6 of 161 eligible diabetes patients at KPGA and 9 of 28 eligible diabetes patients at OMC, and their self-selected supporters, consented to participate. The average age of diabetes patients was 49.3 years. 86.7% (N=13) were African-American; and 33.3% (N=5) were male. Five days after enrollment, 60% (N=9) of patients had connected their wireless transmitters and had current blood glucose data. Follow-up phone calls will be made to ensure that all participants are connected to the wireless technology within 10 days of the enrollment session. **Conclusion:** Integrating mobile telecommunications technology with chronic disease management may empower patients in their own self-care and ease the burden on health care providers. Our study will evaluate the potential for studying the use of wireless mobile technology in a larger randomized controlled trial and will obtain participant comments on what changes might improve participant compliance.

Keywords: Self-monitoring of blood glucose, Telecommunications technology and health, Self-selected supporters

doi:10.3121/cmr.2010.943.ps2-17

PS2-18:

Extreme Childhood Obesity is Associated with Increased Risk for Gastroesophageal Reflux Disease in a Large Population-Based Study

Corinna Koebnick, MS, PhD[1]; Darios Getahun, MD[1]; Ning Smith, MS[1]; Amy Porter, MD[1]; Jack Der-Sarkissian, MD[1]; Steven Jacobsen, MD, PhD[1]

[1]Kaiser Permanente Southern California

Background and Aims: Gastroesophageal reflux disease (GERD) is associated with esophagitis and esophageal adenocarcinoma in adults and may consist from childhood. Childhood obesity may increase risk for GERD. Therefore, we investigated whether moderate and extreme obesity is related to a higher odd for GERD in children of different age groups. **Methods:** For this population-based, cross-sectional study, diagnosis of GERD, and measured weight and height were extracted from electronic medical records

of 690,321 children aged 2-19 years who were enrolled in an integrated prepaid health plan between 2007/2008. Percentile of body mass index [BMI]-for-age was calculated according to the sex-specific 2000 Centers for Disease Control and Prevention growth charts to assign weight class (normal weight, overweight, moderate and extreme obesity). **Results:** GERD was diagnosed in 1.5% of boys and 1.8% of girls (P<0.001). Moderate and extreme obesity were associated with 16% and 32% higher odds for GERD in children aged 6-11 years compared to normal weight, respectively (OR 1.16, 95%-CI 1.02-1.32 and 1.32, 95%-CI 1.13-1.56). In children aged 12-19 years, moderate and extreme obesity were associated with 16% and 40% higher odds for GERD compared to normal weight, respectively (OR 1.16, 95%-CI 1.07-1.25 and 1.40, 95%-CI 1.28-1.52). Obesity was not related to an increased odd for GERD in children aged 2-5 years of age. **Conclusions:** In conclusion, extreme obesity in youth may increase GERD risk by up to 40%. Increasing obesity epidemic among youth may further contribute to an increased incidence of other diseases associated with GERD such as esophagitis and esophageal adenocarcinoma. Early screening of obese youth and treatment of GERD symptoms may help to avoid persistence of GERD into adulthood.

Keywords: Gastroesophageal reflux disease, Childhood obesity, Early obesity screenings

doi:10.3121/cmr.2010.943.ps2-18

PS2-21:

Patient Response to a Clinical Study for Diabetes Education Interventions: Demographic Differences Between Patients Who Enrolled and Those Not Interested in Participating

Ann Von Worley, RN, BSHS, CCRP[1]; Dorothy Baumer, MS[1]; Omar Fernandes, MPH[2]; JoAnn Sperl-Hillen, MD[2]; Herbert Davis, PhD[1]; Sarah Beaton, PhD[1]

[1]Lovelace Clinic Foundation; [2]HealthPartners Research Foundation

Background and Aims: The Journey for Control of Diabetes: the IDEA Study, a randomized clinical study, is evaluating the effectiveness of an interactive, group-based learning experience using Conversation Maps™. Patients with uncontrolled diabetes were sent letters describing the study and subsequently contacted to assess eligibility and interest. Recruitment, estimated to take 5 months, was extended to 11 months due to difficulties in obtaining a committed group of eligible participants. Because of these recruitment difficulties, we examined differences between the enrolled subgroup and those who indicated they were not interested in participation in an attempt to identify patient characteristics of those who enrolled. **Methods:** Of the 4197 patients sent recruitment letters, 286 enrolled, 1345 were not interested in participating, and the remaining 2567 were unable to participate for a variety of reasons. Demographic variables of interest were gender, age, ethnicity and A1C level. We used a software tool, GUESS, which utilizes surname to determine ethnicity. A logistic regression model predicting enrollment was fit to the data using a binary logit link. **Results:** The model had a strong predictive accuracy with a likelihood ratio test resulting in p<.0001. To further dissect the significance of the variables, individual maximum ratio tests were performed. Age was a very significant predictive variable (p<.0001) with older subjects less likely to enroll. Gender was not significant (p=.14). The subjects' A1C prior to recruitment was also significant (p<.0001) with the highest enrollment in the groups close to goal (A1C < 7.5) and those with very high A1C's (A1C > 9.0). Finally, ethnicity was significant (p=.0005) with white non-Hispanics more likely to enroll than Hispanics. **Conclusions:** Several demographic variables were used to assess their impact on a person's desire to participate in the IDEA Study. Of those who met the eligibility criteria, enrolled people were younger, fewer were Hispanic, and more had A1C's either almost at goal or extremely out of control. A better understanding of which potential participants may be more willing to enroll in a study could provide insight into more effective recruitment.

Keywords: IDEA study patient participation, Recruitment strategies, Effective recruitment

doi:10.3121/cmr.2010.943.ps2-21

PS2-22:

Pre-Operative Diabetes is Associated With Poor Weight Loss Outcomes Following Roux-en-Y Gastric Bypass Surgery

G. Craig Wood, MS[1]; Christopher Still, DO[1]; Peter Benotti, MD[1]; Xin Chu, PhD[1]; Christina Manney, BS[1]; David Carey, PhD[1]; Glenn Gerhard, MD[1]

[1]Geisinger Health System

Background and Aims: Identification of preoperative predictors of weight loss after Roux-en-Y gastric bypass surgery may lead to better clinical management. The purpose of this study was to identify whether any clinical variables were different in patients with the best versus worst weight loss outcomes at 24 months following RYGB. **Methods:** Patients who were recruited were enrolled in the Bariatric Surgery Program of the Geisinger Clinic Center for Nutrition and Weight Management. Only Caucasian patients with a BMI greater than 35 kg/m2 who underwent primary Roux-en-Y gastric bypass were included in the analysis. An analysis of available data on more than 200 clinical variables related to medication use, co-morbidities, and baseline laboratory and survey data was performed to determine whether any differences present between the 150 patients who lost the most weight and the 150 patients who lost the least. Chi-square tests and Wilcoxon Rank sum tests were used after a Bonferroni correction. **Results:** A total of 1001 patients (80% female) with a mean age of 46.5 years and a mean initial BMI of 50.2 mg/kg were studied. The diagnosis of diabetes was almost twice as frequent in patients who lost the least weight (p <0.0001). Initial weight, BMI, excess body weight, and waist circumference were also statistically higher in patients who lost the least weight (p <0.0001), although the differences were likely not clinically significant in patients of this BMI range. Post-operatively, the percentage of patients with pre-operative diabetes that had a hemoglobin A1c over 6.5% was approximately 2-fold higher in the group who lost the least weight. **Conclusions:** A pre-operative diagnosis of diabetes and post-operative elevation of hemoglobin A1C levels were more prevalent in those patients with the poorest weight loss outcomes following Roux-en-Y gastric bypass surgery.

Keywords: Roux-en-Y gastric bypass surgery, Pre-operative diabetes, Poor weight loss outcomes

doi:10.3121/cmr.2010.943.ps2-22

PS2-23:

Prevalence of Extreme Obesity in Southern California

Corinna Koebnick, MS, PhD[1]; Ning Smith, MS[1]; Karen Coleman, PhD[1]; Darios Getahun, MD[1]; Kristi Reynolds, PhD[1]; Virginia Quinn, PhD[1]; Amy Porter, MD[1]; Jack Der-Sarkissian, MD[1]; Steven Jacobsen, MD, PhD[1]

[1]Kaiser Permanente Southern California

Background and Aims: Specific weight goals and treatment options for extremely obese children and adolescents have been suggested. The objective of this study is to provide current estimates of the prevalence of extreme obesity in a large multiethnic youth cohort. **Methods:** In a cross-sectional study, measured weight and height were extracted from electronic medical records of 710,949 patients aged 2-19 years (87.8 % of eligible patients) who were enrolled in an integrated prepaid health plan between January 1, 2007 and December 31, 2008. Prevalence of extreme obesity was defined as body mass index [BMI]-for-age =1.2 x 95th percentile according to the sex-specific 2000 Centers for Disease Control and Prevention growth charts or BMI =35 kg/m2. **Results:** Extreme obesity was observed in 7.3% of boys and 5.5% of girls. The prevalence first peaked at about 10 years of age with a bimodal distribution in girls (second peak at 18 years, P for sex × age interaction = 0.036). The prevalence of extreme obesity varied among ethnic/racial and age groups with highest prevalence in Hispanic boys (up to 11.2%) and Blacks girls (up to 11.9%). In 12-19 year olds, the prevalence of obesity class 3 (BMI 40-49.9 kg/m2) and class 4 (BMI =50 kg/m2) was 1.8% and 0.2%, respectively, with the highest prevalence in Blacks (3.5%) compared to Whites independent of sex (P = 0.001). **Conclusion:** Extreme obesity in

Southern California youth is a serious issue and frequently observed at relatively young age. The shift towards extreme body weights is likely to cause an enormous burden of adverse health outcomes once these youth grow older.

Keywords: Extreme Obesity in Southern California youth, Obesity treatment, Adolescent health outcomes

doi:10.3121/cmr.2010.943.ps2-23

HMORN Infrastructure

PS1-27:

Use of Tumor Registry to Obtain Family History Information

Kimberly Lane, MPH[1,2]; JeffreyBrown, PhD[1,2]; Richard Platt, MD, MSc[1,2]

[1]Harvard Pilgrim Health Care Institute; [2]Harvard Medical School

Background: The Human Genome project has revolutionized the field of medicine to move toward personalized medicine. The family history is a screening tool to identify families at risk for common conditions allowing for personalized care. For breast cancer syndromes, genetic testing, counseling and prophylactic treatment are available. While there are data about the efficacy and clinical utility of the family history, there are areas that still need investigation. Does obtaining the family history lead to patient recommendations? Do patients FDA's Mini-Sentinel Initiative: The HMORN's Role.

In May 2008, the FDA Commissioner announced FDA's intention to create the Sentinel Initiative. The Sentinel Initiative is an effort by the FDA to create a coordinated national electronic medical product safety surveillance system. The Food and Drug Administration Amendments Act of 2007 (FDAAA) mandated FDA develop methods to obtain access to disparate data sources and to establish an active post-market risk identification and analysis system linking and analyzing data from multiple sources. The law sets a goal of 25 million patients under surveillance by July 1, 2010, and 100 million patients by July 1, 2012. With the funding and support provided by FDAAA, the FDA laid out the vision for Sentinel Initiative. In September 2009, the FDA awarded a single contract to a consortium of 28 institutions led by the Harvard Medical School Department of Population Medicine at the Harvard Pilgrim Health Care Institute, including 13 HMORN members (all Kaiser Permanente plans, Group Health Cooperative, Lovelace Clinic Foundation, Myers Primary Care Institute, Marshfield Clinic Research Foundation, HealthPartners Research Foundation and Henry Ford Health Services), CIGNA, Humana, WellPoint [HealthCore] and Tennessee's Medicaid system, comprising ~60 million covered lives. Additional data resources include the HMORN's ambulatory electronic medical records linked to enrollment and claims data for ~10 million patients; inpatient electronic medical records (EMRs), including blood product use from 88 adult and pediatric hospitals (approximately half are Kaiser plans); plus device and disease registries. Mini-Sentinel will create a 'laboratory' for developing and evaluating safety surveillance scientific methodologies and offers FDA the opportunity to evaluate safety issues in existing automated healthcare data system(s) while learning about the barriers and challenges inherent in these activities. The collaboration provides FDA with a public-private solution that leverages the strengths of the private sector and academia. Over the next five years, this collaboration will work with FDA to create the foundation for the Sentinel Initiative's long-term goal of setting up a coordinated national post-market safety surveillance system.

Keywords: Tumor registry, Family history screening, Sentinel Initiative

doi:10.3121/cmr.2010.943.ps1-27

PS1-28:

Kaiser Permanente Center for Effectiveness and Safety Research

Donald Bachman, MS[1]; Pierre-Andre La Chance, BS[1]; Mark Hornbrook, PhD[1]

[1]Kaiser Permanente Center for Health Research

Background: Kaiser Permanente has inaugurated an interregional research initiative focusing on comparative effectiveness and safety (CESR). All eight regions will partner to take advantage of their large and diverse populations, exceptional scientists, and extensive data resources. **Aim:** To provide HMORN collaborators: (1) an understanding of where CESR is and where it will be going; (2) a description of CESR governance rules; and, (3) a guide to pathways for partnerships with collaborators.

Keywords: Inter-regional research, Comparative effectiveness and safety

doi:10.3121/cmr.2010.943.ps1-28

PS1-29:

Resources to Facilitate Multi-site Collaboration: the PRIMER Research Toolkit

Sarah Greene, MPH[1]; Ella Thompson, BS[1]; Laura-Mae Baldwin, MD, MPH[2]; Anne Victoria Neale, PhD, MPH[3]; Rowena Dolor, MD, MHS[4]

[1]Group Health Cooperative; [2]University of Washington; [3]Wayne State University School of Medicine; [4]Duke University Medical Center

Background and Aims: The national research enterprise has typically functioned in a decentralized fashion, resulting in duplicative or undocumented processes, impeding not only the pace of research, but diffusion of established best practices. To remedy this, many long-standing networks have begun capturing and documenting proven strategies to streamline and standardize various aspects of the research process. The project, "Partnership-driven Resources to IMprove and Enhance Research" (PRIMER), was funded through the Clinical and Translational Science Awards (CTSA) initiative to leverage the collective expertise from two networks: the HMO Research Network and Practice Based Research Networks (PBRNs). Each network has a shared goal of propagating research resources and best practices. **Methods:** We created and distributed an online survey to 92 CTSA and PBRN representatives in March, 2009 to define critical needs and existing resources that could inform a resource repository. The survey identified barriers and benefits to forming research partnerships, and assessed the perceived utility of various tools that could accelerate the research process. The study team identified, reviewed and organized tools based on the typical research trajectory from design to dissemination. **Results:** Fifty-five of 92 invitees (59%) completed the survey. Respondents rated the ability to conduct community-relevant research through true academic-community partnerships as the top-rated benefit of multi-site research, followed by the opportunity to accelerate translation of research into practice. The top two perceived barriers to multi-site research were 'funding opportunities are not adequate (e.g., too few, not enough to support true collaborations), and 'lack of research infrastructure to support [all] partners (e.g., no IT support, IRB, dedicated research staff). Respondents' ratings of the utility of various tools and templates was used to guide development of an online repository: www.ResearchToolkit.org, which is comprised of over 120 distinct resources. **Conclusions:** We are disseminating the ResearchToolkit website via academic and media channels, and identifying options for making it a sustainable resource. Given the dynamic nature of the research enterprise, maintenance and accuracy of a web-based resource is challenging. Still, the positive response to the toolkit suggests that there is high interest in sustaining it. We will demonstrate the Toolkit as part of this conference.

Keywords: Partnership-driven Resources to Improve and Enhance Research, Research processes, Forming research partnerships

doi:10.3121/cmr.2010.943.ps1-29

PS1-30:

O Say Can You C(ER) – An Inventory of Comparative Effectiveness Research Capacity in the HMO Research Network

Ella Thompson, BS[1]; Sarah Greene, MPH[1]; Eric Larson, MD, MPH[1]

[1]Group Health

Background and Aims: The HMO Research Network (HMORN) is uniquely positioned to conduct Comparative Effectiveness Research (CER). The 2009 health care reform debate; Recovery Act legislation and funding mandates; the Institute of Medicine (IOM) report of Initial National Priorities for Comparative Effectiveness Research and other forces have all worked to focus attention on CER as never before. We present results from a survey of HMORN leadership which explored the Network's perceived competitiveness in responding to the IOM-generated top 50 priority topics in CER. The survey results are cross-referenced with research interests of HMORN scientific staff. We also review existing methodological and administrative HMORN resources available to assist with proposing, launching and carrying out CER projects. Finally, we briefly summarize initiatives spearheaded by HMORN leadership to build additional CER capacity across the Network. **Methods:** HMORN Board members were asked to complete an online survey, rating their perceptions of the Network s competitiveness in responding to the top two quartiles of initial national CER priorities outlined by the IOM. Response options were not competitive, a little competitive, somewhat competitive, quite competitive, very competitive and unsure. The initial survey link was sent July 17, 2009. Reminders were sent to non-responders on July 29 and August 14. The survey was completed by 88% of Network leaders (14 of 16). We cross-referenced CER priorities with research interests expressed by Network investigators in the HMORN Researcher Directory, available at www.hmoresearchnetwork.org. **Results:** Overall, respondents view the HMORN as very well positioned to respond to the top two quartiles of IOM Comparative Effectiveness priorities. While some priorities align well with established Network collaborations (e.g., cardiovascular disease, cancer) the HMORN has not yet fully capitalized on other IOM CER priorities, even though capacity appears to exist (e.g., care coordination, inflammatory diseases, bone health, shared decision making, dissemination techniques). **Conclusions:** In the CER arena, the HMORN has significant potential, with numerous opportunities to capitalize on its scientific and collaborative expertise. The Network is further improving its ability to respond to emerging CER funding opportunities by proactively inventorying scientific and methodological expertise, enhancing data capabilities, training staff and developing tools.

Keywords: Comparative Effectiveness, HMO Research Network, Enhancing data capabilities

doi:10.3121/cmr.2010.943.ps1-30

PS3-05:

Electronic Data Collection for a Clinical Trial Conducted within a Health System

Tessa Kerby, BA[1]; Nicole Schneider, BA[1]; Stephen Asche, MA[1]; Linda Loes, MD[1]; Michael Maciosek, PhD[1]; Peter Meyers, BS[1]; Derek Michalski[1]; Karen Margolis, MD, MPH[1]

[1]HealthPartners

Background/Aims: Designing a seamless data collection tool for a research study across multiple physical locations within a health care system is challenging. Paper-based data collection is prone to data entry errors, subject to delays in availability of data, and environmentally wasteful. Web-based data collection tools are costly, time consuming to produce, and have security issues. We used Microsoft Access to create an efficient, low-cost electronic data collection tool for a clinical trial that required availability at numerous locations in the HealthPartners system. **Methods:** The research study required data collection entry points at ten different locations for different types of users, all linked into the HealthPartners computer network. A single Access database with linked modules for recruitment, tracking, eligibility determination and data collection was designed. **Results:** The recruitment module used at the research department integrated data on recruitment mailings and telephone screening of interested respondents, and used an automated algorithm to perform eligibility checks. The research clinic module for clinic visits was populated with eligible participants as determined by the recruitment module. This clinic module included further eligibility checks, data collection and treatment assignment. Participants then became available in the intervention module to pharmacist case managers located at 8 HealthPartners primary care clinics to collect data for the intervention. Based on study entry date, Access created a visit log to aid the case managers with timely adherence to the trial protocol. The database is stored on a secure server that is accessible only to authorized study team members, with further restrictions on data entry and access determined by study team role. **Conclusions:** The disadvantages of Microsoft Access (lack of flexibility, "bugginess", older technology) are counterbalanced by many advantages (ready availability, inexpensiveness, security, the ability to analyze data in real time). Research teams should consider these factors when designing electronic data collection tools.

Keywords: Electronic data collection, Data collection tools, Clinical trials

doi:10.3121/cmr.2010.943.ps3-05

Early Career Investigator Awardees

Plenary III–01:

A Methodology for Quantitative Measurement of Quality and Comprehensiveness of a Research Data Repository

Vojtech Huser, MD, PhD; Marshfield Clinic Research Foundation

Background and Aim: With the existence of research over federated repositories, it is desirable to utilize high quality integrated data repositories (IDRs). IDR can be defined as a data warehouse optimized for research purposes rather than clinical care, which contains clinical, administrative, trial, and -omics data. In this work, we focus on the quality of clinical and administrative components of IDRs. There is no standardized methodology which could quantitatively evaluate the quality of an IDR (e.g., 'Does a given IDR have at least 2000 adult diabetic patients (type 1) with complete pediatric history?'). With the increased interest in research of existing data (such as comparative effectiveness research) and increasing number of institutions with an comprehensive IDRs, it is important to have a mechanism for selecting quality IDRs. **Methods:** Our poster will present a set of IDR quality measures which can compare IDRs in size and completeness. We considered the following criteria for a good measure: the measure is intuitive to interpret; facilitates monitoring improvement; and does not place any arbitrary value on individual measure components. Our methodology proposes a hierarchy of definitions of minimum EHR elements and uses a simple count of each level to quantitatively evaluate an IDR (e.g., count of patients with at least one diagnosis and one laboratory result). **Results:** We have applied our methodology to an IDR at Marshfield Clinic. Our poster will list all measures and results. Selected results were: 1.7M unique patients (level G1), 0.4M patients with at least one diagnosis, lab and prescription (level D3). To facilitate evaluations at other institutions, we have created an ANSI-SQL script which can compute all measures in a single execution. **Conclusion:** Our evaluation methodology provides a quick way to compare IDRs at different institutions. It can be applied to institutions contributing to a virtual warehouse. Our goal was to arrive at a pragmatic set of measures operating on an easy-to-implement event schema. The limitations are: focus on general research idea and event types and criteria included in some level definitions. We plan to conduct a Delphi study involving informatics experts to arrive at an improved consensus set of measures.

Keywords: Integrated data repositories, Quality measurements, Data evaluation methods

doi:10.3121/cmr.2010.943.plenary-iii-01

Plenary III–02:

Propensity Score-based Sensitivity Analysis Method for Uncontrolled Confounding

Lingling Li, PhD[1,2]; Changyu Shen, PhD[3]; Xiaochun Li, PhD[3]

[1]Harvard Medical School; [2]Harvard Pilgrim Health Care Institute; [3]Indiana University School of Medicine

Background: Uncontrolled confounding remains a major concern for comparative effectiveness and safety results obtained from analyzing observational studies, especially those using existing healthcare databases. Sensitivity analyses are of paramount importance and usefulness in assessing the effect of possible uncontrolled confounding on the estimates of the parameter of interest to adequately evaluate the validity of the corresponding results and inference. **Methods:** We develop a sensitivity analysis method to address the issue of uncontrolled confounding in observational studies. In this method, we quantify the hidden bias due to uncontrolled confounding using a one-dimensional sensitivity function (SF), which depends on the propensity score only. Propensity score is defined as the conditional probability of being assigned to a selected treatment given the measured confounders. The new method nicely reduces the dimension of the sensitivity function, and makes it much easier to impose reasonable assumptions on the sensitivity functional forms and the values of coefficients. In addition, it offers opportunities for robust inference since one-dimensional continuous functions can be well approximated by low order polynomial structures (e.g., linear, quadratic). Therefore our proposed approach is especially useful when limited information is available on the type and mechanism of unmeasured confounders. We construct SF-corrected inverse probability weighted estimators to draw inference on the causal treatment effect. We demonstrate the use of the new method by implementing it to an asthma study which evaluates the effect of clinician prescription pattern about the use of inhaled corticosteroids (ICs) for children with persistent asthma on selected clinical outcomes. **Results:** Without considering uncontrolled confounding, daily-use pattern of ICs appears to be harmful than the periodic-use pattern with an increased risk for uncontrolled asthma during the 12-month follow-up period (odds ratio 2.4, 95% CI, 1.7, 3.9). This seemingly harmful effect of daily-use pattern diminishes as the assumed magnitude of hidden bias increases. Nevertheless, within the considered plausible range, the data does not provide evidence suggesting a significant beneficial effect of the daily-use pattern compared to the periodic-use pattern. **Conclusions:** Our proposed approach provides a practical tool to conduct sensitivity analysis for uncontrolled confounding in observational studies.

Keywords: Uncontrolled confounding, Observational studies, Sensitivity analysis method

doi:10.3121/cmr.2010.943.plenary-iii-02

Plenary III–03:

Adherence to Home Blood Pressure Monitoring in Patients with Uncontrolled Blood Pressure

Simrandeep Tiwana, PhD, MBA[1]; Tessa Kerby, BA[1]; Stephen Asche, MA[1]; Nicole Schneider, BA[1]; Michael Maciosek, PhD[1]; Peter Meyers, BS[1]; Linda Loes, MD[1]; Sarah Groen, PharmD[1]; Holly Jewell, PharmD[1]; Krissa Klotzle, PharmD[1]; Ryan Michels, PharmD[1]; Karen Margolis, MD, MPH[1]

[1]HealthPartners

Background/Aims: Home blood pressure monitoring has been advocated as a method for improving blood pressure (BP) control. However, there is little data on patients' adherence to home BP monitoring. The purpose was to study patient adherence to home BP monitoring and telephone visits with a healthcare provider in a randomized controlled trial. **Methods:** The Hyperlink study is a cluster randomized trial in which adult patients with uncontrolled BP are assigned either to the Telemonitoring Intervention (TI) arm or the Usual Care (UC) arm. These preliminary analyses are based on the first 80 participants of a planned enrollment of 450. Patients in the TI arm work with a clinical pharmacist who serves as their case manager and may adjust their treatment according to a protocol. Following one face-to-face meeting, patients and pharmacists meet via phone every 2-4 weeks for a period of 6 months. Patients are instructed to take 2-3 BP readings on 3 mornings and 3 evenings each week, and to transmit the stored BP data to the pharmacist weekly. Adherence is defined as sending = 6 home BP measurements per week. We examined adherence to both telephone visits and the home BP measurement schedule. **Results:** Adherence with the telephone visits was excellent with completion of 359/370 (97%; 95% CI 95%-99%) protocol-mandated telephone visits. Adherence to the home BP measurement schedule was also high, with 73/80 (91%; 95% CI 85%-97%) participants sending an average of >6 BP measurements per week. Participants older than 65 showed greater BP measurement schedule adherence than those younger than 65 (100% versus 86%; p=0.04 by Fisher's exact text). Adherence did not differ significantly by gender, race or employment status. **Conclusion:** Despite an intensive visit and measurement schedule, adherence to blood pressure telemonitoring was very high in the study population. We conclude that blood pressure telemonitoring has the potential to improve BP control by conveying reliable blood pressure data to healthcare providers who can then close the feedback loop by making appropriate therapeutic adjustments.

Keywords: Home blood pressure monitoring, Blood pressure control, Blood pressure telemonitoring

doi:10.3121/cmr.2010.943.plenary-iii-03

Plenary III–04:

Responses to Drug Costs: Year Three of the Medicare Part D Program

Vicki Fung, PhD[1]; Mary Reed, DrPH[1]; John Hsu, MD, MBA[1]

[1]Kaiser Permanente Division of Research

Background/Aims: Many Medicare Part D beneficiaries face substantial prescription drug cost-sharing. In the first year of the program, many beneficiaries reported substantial drug use changes in response to the coverage gap. In response, an increasing number of plans offer generic drug coverage during the gap. We compared responses to Part D costs among beneficiaries with generic-only gap coverage and full gap coverage in 2008, the third year of the Part D program. **Methods:** We conducted telephone interviews in a stratified random sample of Medicare Advantage beneficiaries in an integrated delivery system, age 65+ (N=1201, response rate 70.0%). We sampled equal numbers of beneficiaries with generic-only gap coverage, and beneficiaries with no gap due to low income subsidies (LIS) or employer sponsored insurance (ESI). Beneficiaries reaching the gap threshold in 2008 ($2,510 in total drug spending) were oversampled. We examined three cost responses: cost-cutting strategies (e.g., switching to cheaper medications), decreasing adherence (e.g., not refilling a prescription), and experiencing financial burdens (e.g., going without necessities). We used multivariate logistic regression and adjusted for sociodemographic and clinical characteristics and 2008 drug costs. All analyses and percentages are weighted for sampling proportions. **Results:** An estimated 18.4% of beneficiaries reported using a cost-cutting strategy, 2.9% decreased adherence, and 9.6% experienced financial burdens. After adjusting for covariates, compared with beneficiaries with generic-only gap coverage, LIS and ESI beneficiaries were significantly less likely to report each of the cost responses: cost-cutting strategies (OR=0.50, 95% CI: 0.31-0.83 for LIS and OR=0.58, 95% CI: 0.39-0.87 for ESI beneficiaries), decreased adherence (OR=0.36, 95% CI: 0.14-0.92 for LIS and OR=0.21, 95% CI: 0.07-0.62 for ESI beneficiaries), and financial burden (OR=0.51, 95% CI: 0.29-0.89 for LIS and OR=0.41, 95% CI: 0.23-0.73 for ESI beneficiaries). **Conclusions:** Overall reports of cost-related non-adherence were lower compared with earlier reports among beneficiaries with no gap coverage; nevertheless beneficiaries with generic-only gap coverage were more likely to report non-adherence and financial burdens compared with beneficiaries with no gap. However, beneficiaries with no gap were also less likely to switch to cheaper medications, suggesting a need for additional efforts to guide beneficiaries' drug choices.

Keywords: Medicare Part D, Medication costs, Generic drug coverage

doi:10.3121/cmr.2010.943.plenary-iii-04

All abstracts received on May 27, 2010;
Accepted on May 27, 2010