Clinical Medicine & Research
Volume 6, Number 3/4: 119-151

clinmedres.org

Selected Abstracts from the 14th Annual HMO Research Network Conference, April 13-16, 2008, Minneapolis, Minnesota

Oral Presentations

Research Administration

Abstract C-A1-01
Administrative Support for Advancing Collaborative HMORN Research

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Background: Frequently, only a short time exists between preparation of a multi-site HMORN proposal and its submission. When a collaborative project is under development, the prime institution needs to work individually with other institutions to gather information for submission. This approach is significantly time consuming. **Methods:** Over the past year and a half, the above presenters have been addressing ways in which collaborative HMORN grant submissions and awards could be streamlined and facilitated. This working group has begun to address such issues as: developing a web site in order to house HMORN members' resources, boilerplate documents, guidelines, etc.; effort reporting practices; standardizing checklists and statement of intent forms; compiled human subjects training requirements; facilitating the implementation of multi-site clinical trials; and developing post award subcontract boilerplates. Several working committees were established and convened on a monthly basis to address each of these issues. Each committee was charged with the responsibility of creating guidelines and/or documents that would successfully address these issues. **Results:** The results of this year's efforts will be presented at this workshop. Materials that have been created will be distributed to all audience participants and subsequently posted on the HMORN website. In addition, all attendees will be asked for additional input to the final recommendations of the committees. Lastly, participants at this workshop will be asked to indicate those issues that, as administrators, they believe will continue to need to be addressed in order to further facilitate collaborative grant applications among the HMORN members. **Conclusions:** Multiple multi-site grants have been submitted and awarded to one of the HMORN members on behalf of the HMORN. The CRN, CERT, CCSN, IDSRN, as well as the Vaccine Data Safety Link, the Cancer Care and Outcomes Research Surveillance Consortium and, most recently, the Cardiovascular Research Network are examples. In a tight funding environment, additional collaborative grant applications will become increasingly necessary. Success can be further enhanced with streamlined research administration practices.

Pharmacoepidemiology

Abstract C-A2-02
Development, Implementation and Evaluation of an Educational Curriculum on Pharmaceutical Marketing and Prescribing

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Background: Lawsuit settlement funds from off-label marketing of Neurontin were earmarked for clinician education on drug development, approval and marketing. Four HMORN CERTs sites, including Kaiser Permanente Colorado (KPCO), received grants. **Aims:** To develop, implement, and evaluate curricula on drug marketing and prescribing based on needs assessments of prescribing clinicians (PCs) and KPCO organizational leaders. **Methods:** Online interactive curricula were developed after surveys of physicians, nurse practitioners, physician assistants and KPCO organizational leaders. 'Pharmaceuticals from Development to Practice,' included 3 modules (4 CME credits): Off-Label Use of Pharmaceuticals, Accessing & Appraising Unbiased Drug Information, and Addressing Patient Inquiries about Specific Medications Advertised to Consumers. Modules contained didactic material, case studies incorporating heavily marketed medications, and self-reflection questions. Participants could pose questions to faculty, who responded by email. Participants were invited to a follow-up session to share learnings and interact with faculty. PCs were randomized to participate in 2 phases, the latter cohort a delayed comparison group for pre-post time-series prescribing analysis of heavily marketed medications. Other outcomes included self-reported intent to change, knowledge changes, number and descriptions of questions posed to faculty, qualitative summaries of reflection questions, and participant ratings of each module. **Results:** Final sample sizes were 43 for prescribing and 47 for other outcomes. Each module had 33 to 44 participants. 14 questions were posed to faculty; 131 intent-to-change statements were generated. Nearly all participants agreed that the modules met their objectives. Over 90% of participants indicated increased knowledge on accessing/appraising drug information and off-label prescribing/promotion; 70% indicated increased comfort in addressing patient inquiries. Due to small sample size, cohorts will be combined for prescribing analysis, with participants compared to non-participants. **Conclusions:** Participants valued the curricula on the impacts of pharmaceutical marketing and prescribing. Subsequent evaluation will include effect on prescribing and follow-up on intended practice changes. Additional strategies are needed to increase prescriber interest and participation in curricula on this topic.

Abstract C-A2-04
Adherence to Urate Lowering Medications for the Treatment of Chronic Gout

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Background: Patients with chronic gout require sustained treatment with urate-lowering drugs (ULDs). Little is known regarding adherence to medication treatment for gout. Our aim was to assess the level and determinants of adherence with ULDs prescribed for chronic gout. **Methods:** A retrospective cohort study was conducted using administrative data from two health plans participating in the HMO Research Network Center for Education and Research on Therapeutics. We identified all persons 18 years

or older with a diagnosis of gout who initiated use of a ULD (allopurinol or probenecid) from January 1, 2000 through June 2006 who were enrolled for at least 12 months after the first ULD dispensing. Adherence was measured based on the medication possession ratio (MPR) which was determined by the sum of the day's supply of drug therapy from the first dispensing to the end of the 12-month period. Covariates included age, sex, comorbid illnesses and medications associated with gout, concurrent treatments for gout and the Charlson comorbidity index. **Results:** Preliminary data for 627 gout patients at one health plan indicated the median MPR was 0.49 (±0.32) for allopurinol and 0.48 (±0.37) for probenecid. Factors associated with poor adherence (defined as an MPR <0.80) included younger age (<45 yrs), fewer comorbid conditions, use of nonsteroidal anti-inflammatory drugs (NSAIDs) prior to initiation of a ULD, and use of a glucocorticoid or NSAID after initiating a ULD. **Conclusions:** Nonadherence is common in gout, particularly in young men without other comorbidities. In addition, it appears those with more active gout (based on dispensings of NSAIDs and glucocorticoids) are less adherent.

Abstract C-A2-05

Pneumonia Risk Among COPD Patients Using Fluticasone/Salmeterol Versus Other Inhaled Steroids and Bronchodilators Alone

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Background/Aims: In recently published randomized clinical trials, COPD patients using inhaled corticosteroids (ICS) alone or in combination with long-acting beta-agonists (LABA) were found to have a small but significantly increased risk of pneumonia. The purpose of this project was to determine whether general population COPD patients using a combined fluticasone and salmeterol inhaler had a higher risk for pneumonia compared to those using other inhaled ICS or bronchodilators, either alone or in combination. **Methods:** COPD patients were identified from three health systems in different regions in the United States. The study population was comprised of 5245 individuals who used some form of inhaled treatment during the study period (September 1, 2000 through August 31, 2003), 2154 of whom had at least one pneumonia episode confirmed by chest X-ray or hospitalization. Nested case-control methods were used to calculate odds ratios (OR) for the risk of pneumonia while on therapy. **Results:** With patients using short-acting bronchodilators as the reference group, the only treatment associated with a possibly increased risk of pneumonia was ICS used alone (OR, 1.29; 95% CI, 0.96-1.73; *P*=0.09). Users of LABA alone (OR, 0.92; 95% CI, 0.69-1.22) and fluticasone and salmeterol in combination (OR, 1.03; 95% CI, 0.74-1.42) had no increased risk for pneumonia. **Conclusions:** In this retrospective analysis of a large COPD cohort, treatment with any ICS, LABD, or ICS and LABD in combination was not associated with a substantially increased risk for developing pneumonia. Funded By: GlaxoSmithKline Research & Development.

Abstract C-A2-08

Prescribing to Older Individuals in Conjunction With Emergency Department Visits

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Background/Aims: The emergency department (ED) is a high-risk care setting. Risk of adverse drug events (ADE) associated with ED care is insufficiently explored, particularly among older patients. We examined prescribing to individuals aged 60 years or older during an ED visit. The aims were to (1) ascertain drugs newly initiated in conjunction with an ED visit, (2) determine the proportion of newly initiated drugs that are considered high-risk, (3) determine the proportion of patients with discharge diagnoses associated with increased ADE risk, and (4) describe repeat ED visits among these patients. **Methods:** Patients must have had health plan membership for 6 months prior to the ED visit and remained members (or die) within 6 months after the visit. Data to identify the cohort, determine prescribing, and establish ED visits were extracted from electronic medical records and administrative claims. Drugs were defined as newly initiated if no drug within that therapeutic class was dispensed to that patient within the previous 180 days and if the drug was dispensed within 72 hours of ED discharge or before the next outpatient visit (if sooner). Drugs were classified as high-risk based on literature associating the drugs with ADE (i.e., drug-drug or drug-disease interactions, drug-laboratory monitoring recommendations, drugs to avoid in the elderly). Discharge diagnoses were classified as increased risk of ADE based on published evidence. A repeat ED visit was defined as an ED visit within 180 days of the first ED visit. **Results:** At Kaiser Permanente Colorado in 2006, 6868 older patients were discharged to home after an ED visit, with 1338 patients newly initiated on 1883 drugs. Ten classes accounted for 80% of newly initiated drugs; all are high-risk for ADE among older patients: narcotics (27%), antibiotics (25%), corticosteroids (6%), antihistamine/cold remedies (5%), antispasmodics (4%), anti-anxiety agents (4%), anti-asthmatics (3%), anticoagulants (2%), gastrointestinal drugs (2%), and muscle relaxants (2%). A primary discharge diagnoses was listed in 25% of visits; diagnoses included cardiovascular, respiratory, gastrointestinal, neurologic, metabolic, end-stage renal disease, hypoglycemia, hemorrhage, rash, and syncope. 48% of patients had a repeat ED visit. **Conclusions:** Among older patients, high-risk drugs are often initiated in conjunction with an ED visit. Work is needed to determine the extent to which drugs initiated during ED visits result in ADE.

Abstract C-A2-09

Older Age and Less Aggressive Hypoglycemic Therapy for Diabetes Mellitus

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Background: Pharmacoepidemiologic studies using claims databases show lower intensity of drug treatment for diabetes mellitus (DM) with older age and greater comorbidity, but do not account for level of glycemic control. The aim of this study is to describe patterns of hypoglycemic use among older adults with DM while controlling for patient-level factors, including glycemic control. **Methods:** We conducted a cross-sectional study among enrollees of a mixed-model, not-for-profit HMO operating in New England. We identified 772 patients who were aged 65 years and older, had a diagnosis of type 2 diabetes mellitus from January 1 to December 31, 2002, and used at least one hypoglycemic medication. Information on age, sex, prescription drug dispensings, inpatient and outpatient diagnoses and procedures, and laboratory test results were obtained from HMO automated databases. Comorbidity burden was assessed by calculating the Chronic Disease Score based on prescription drug dispensings. We used multivariable logistic regression to identify the independent effect of age on intensity of hypoglycemic medication use (monotherapy vs multidrug or insulin therapy) while controlling for patient-level factors including glycemic control, Chronic Disease Score, and presence of coronary heart disease (CHD), hypertension and dyslipidemia. **Results:** Overall, 541 (70.1%) used one oral hypoglycemic agent, 181 (23.5%) used two oral agents, 10 (1.3%) used three oral agents, and 26 (3.4%) used insulin therapy. In adjusted analysis, predictors of less aggressive (monotherapy) versus more aggressive (multidrug or insulin) therapy were older age (=85 yrs vs 65-74 yrs; odds ratio, 0.32; 95% CI, 0.15-0.67) and prior hospitalization (OR, 0.45; 95% CI, 0.25-0.80). Poorer glycemic control was associated with more aggressive hypoglycemic therapy (HgA1c >9 vs HgA1c <7; OR, 2.9; 95% CI, 1.3-6.5). History of CHD increased the likelihood of using more aggressive hypoglycemic therapy (OR, 1.6; 95% CI, 1.06-2.45). **Conclusions:** Although prevalence and risk of complications from diabetes increases with age, intensity of drug treatment for diabetes declines with older age even after adjustment for glycemic control and comorbidity.

Health Disparities

Abstract C-A3-02A

Demographic Data Collection on Racial, Ethnic, and Language Preference Information

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Tell me everything about yourself: who you are, where you are from, what languages are you most comfortable in. In 2004, the Kaiser Permanente Partnership Group approved a program-wide policy on the collection of race, ethnicity, and language preference data. Meaningful, authentic, and accurate information is essential to the provision of quality and equitable health care. Health disparities among racial and ethnic minorities continue to be persistent and pervasive. Heightening this complexity is increasing immigration from countries and territories outside of the United States. In 2005, there were over 35 million foreign-born persons in the United States; and our regions rank among the top states with the highest foreign-born populations. A critical barrier to both patient-centered care as well as culturally and linguistically competent care is the frequent lack of patient data. Systematic collection and analysis of demographic data would inform opportunities to improve health care at various levels of service, from provider-patient interaction to system-wide institutional change. Standardized data collection would enhance our care delivery model; improving our ability to eliminate health disparities/inequities as well as attend to the different needs of our various populations. Come explore innovative data collection activities, the challenges and lessons learned in these processes, as well as opportunities for data utilization.

Abstract C-A3-03B

Cardiometabolic Risk and Healthcare Utilization for Hispanic and Non-Hispanic Female Health Plan Members

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Objectives: Cardiometabolic risk (CMR) is the overall risk of developing diabetes and/or cardiovascular disease due to a cluster of modifiable risk factors. CMR has been defined in a variety of ways, but all definitions include some combination of abdominal obesity, hypertension, hyperglycemia, and dyslipidemia. This retrospective study was conducted to (1) determine the prevalence of these CMR factors among female health plan members, identifying differences by ethnicity status (Hispanic vs non-Hispanic); and (2) quantify differences in 2-year healthcare utilization between cohorts of individuals with CMR versus controls without CMR. **Methods:** The study consisted of 2578 female members (27.6% Hispanic) of a southwestern US HMO who had a bone mineral density test during 2003-2004. This population was selected since these patients had, in addition to their bone scan results, a measure of height and weight, allowing us to calculate BMI. The following risk factors were used to define CMR: obesity (BMI >27 kg/m^2), high triglycerides (>150 mg/dL), low HDL cholesterol (<50 mg/dL), high blood pressure (systolic >130 mm Hg or diastolic >85 mm Hg), and high fasting glucose (>100 mg/dL). **Results:** Results showed that Hispanic females had significantly higher prevalence rates of CMR compared to non-Hispanic females (65.8% vs 52.3%, respectively, $P<0.001$). Patients with CMR factors were more likely than controls to have at least one hospitalization ($P<0.05$). Outpatient visit rates and total costs were higher than controls, particularly for those patients with a diabetes diagnosis. Patients with obesity and diabetes and patients with obesity, diabetes, and dyslipidemia averaged approximately 34 visits vs approximately 22 visits for their respective controls ($P<0.01$). Total costs were about $11,500 for those cases with diabetes vs $5,500 for controls. Total costs for all CMR cases were about $7,000 vs $5,500 for controls. **Conclusions:** Higher rates of CMR among female Hispanics compared to female non-Hispanics are consistent with earlier studies. The higher utilization for those with CMR suggests the need for health maintenance organizations to identify and monitor health plan members with CMR. Future research should explore cultural diversity as it relates to CMR, including differences between Hispanics and non-Hispanics in access to care and disease management programs.

Obesity

Abstract C-A4-01

Incidence of Overweight and Obesity Among Child, Adolescent, and Adult Enrollees of a Managed Care Organization

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Background: While the prevalence of adult obesity and pediatric overweight (OW) is well known, incident obesity/OW is minimally described in the literature. We estimated 1-year incidence rates of adult obesity and pediatric OW among enrollees of a group-model managed care organization. We also examined demographic, clinical, and socioeconomic correlates of incident obesity/OW. **Methods:** Enrollee-level data, including enrollment history and demographics, height and weight measurements and chronic disease history, were linked with US Census data based on residential address and geocoded to the census block group. Among enrollees with more than one BMI in a year, the average of BMIs was used for ascertaining adult obesity and the last BMI was used for ascertaining pediatric OW. Separate analyses were conducted for adult (18-74 years) and pediatric (2-17 years) enrollees. Associations of incident obesity/OW with enrollee and area-based residential characteristics were assessed using bivariate statistics. **Results:** In 2006, 37.0% of adult enrollees (n=155,887) were obese. Among adult enrollees not obese in 2006 with BMI measured again in 2007 (n=67,200), 5.8% became obese by 2007. Incident obesity was associated with age (6.6% for 30-39 years, 3.4% for ≥70 years; $P<0.01$) and pre-existing diabetes (7.8%, $P<0.01$) and hypertension (6.7%, $P<0.01$). Incident obesity was higher among adults living in areas with higher percentage of black residents ($P<0.01$), adults with a high school education or less ($P<0.01$), and lower median household income ($P=0.02$). In 2006, 33.7% of child and adolescent enrollees (n=29,995) were OW. Among children and adolescents not OW in 2006 with BMI measured again in 2007 (n=10,743), 9.2% became OW by 2007. Incident OW was associated with age (11.4% for 2-9 years, 6.3% for 13-17 years; $P<0.01$), male gender (9.7%, $P=0.04$), and pre-existing diabetes (25.0%, $P=0.01$). Incident OW was higher among children and adolescents living in areas with higher percentage of black residents ($P=0.01$), adults with a high school education or less ($P=0.01$), and lower median household income ($P<0.01$). **Conclusions:** Rates of incident obesity among adults and OW among children and adolescents will be compared to similarly calculated rates for metabolic syndrome conditions. Findings inform the need to target lifestyle intervention recruitment to specific subsets of enrollees at risk of becoming obese or OW.

Abstract C-A4-03

BMI, Health Behaviors and Utilization of Preventive Services in the California Men's Health Study

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Background: Two-thirds of U.S. adults are overweight or obese. Obesity is a major risk factor for cardiovascular disease, type II diabetes, and certain cancers including prostate and colorectal. While overweight and obesity are associated with increased morbidity, mortality and health care costs, their association with health behaviors and use of preventive health services is unclear. **Methods:** We examined lifestyle and screening exams in the past 5 years by categories of body mass index (BMI) in the California Men's Health Study (n=84,170). The cohort includes Kaiser Permanente members 45-69 years of age in 2003-2004 with nearly 40% belonging to a minority racial/

ethnic group. **Results:** 25% reported healthy weight (BMI=18.5-24.9); 45% overweight (BMI=25.0-29.9); and 19% and 7% obesity categories I or II+ (BMI=30.0-34.9, 35+). In multivariable analyses controlling for sociodemographics and health care characteristics, we found significant differences in health behaviors and use of preventive services by categories of BMI. Obese men reported lower levels of alcohol consumption and were less likely to be a current smoker. On the other hand, overweight and obese men were less likely to consume a diet with <30% of calories from fat [OR (CI), 0.71 (0.68-0.74); 0.49 (0.46-0.51); 0.38 (0.35-0.41)]. A similar trend was seen for physical activity. Overweight and obese men were less likely to participate in moderate activity [OR (CI), 0.81 (0.78-0.84); 0.51 (0.48-0.53); 0.31 (0.29-0.33)] or vigorous activity [OR (CI), 0.73 (0.70-0.76); 0.47 (0.44-0.50); 0.29 (0.26-0.32)]. An inverse trend was found for sedentary behavior. Men with a BMI of 35+ were twice as likely to report sedentary behavior for 6.5+ hours/day [OR (CI), 2.04 (1.90-2.18)]. For screening exams, overweight and obese men were more likely to report having had their glucose, cholesterol, and triglycerides tested, and among men with diabetes, their HgAlc. In contrast, obese men were less likely to report a PSA test [OR (CI), 0.84 (0.79-0.89); 0.74 (0.68-0.80)] or, among men at average risk for colorectal cancer, a screening sigmoidoscopy [OR (CI), 0.84 (0.79-0.90); 0.73 (0.67-0.81)]. **Conclusions:** Despite having more primary care visits, obese men may be at greater risk due to lower utilization of common screening exams. Results suggest targeted efforts are needed to increase cancer screening and physical activity, and lower consumption of dietary fat among patients with elevated BMIs.

Abstract C-A4-04

One-Year Weight Change and Glycemic Control After Diagnosis of Diabetes Mellitus Type 2

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Background/Aims: Limited real-world data describe weight change, associated factors, and glycemic control after diagnosis of diabetes. This study evaluated weight trajectories, glycemic control, and associated factors in the first year after diagnosis of diabetes mellitus type 2 in otherwise healthy patients. **Methods:** Participants were patients aged 21-75 with diabetes mellitus type 2 diagnosed between January 1, 1997 and December 31, 2004, identified from electronic medical records. Eligible patients for this retrospective cohort study met weight measurement criteria and did not have a condition associated with unintentional weight change (n=4135). We estimated 12-month patient weight trajectories using growth curve analyses, grouped similar trajectories using cluster analysis, and compared characteristics among groups. **Results:** The four weight trajectory groups were 'higher stable weight' (n=757; 18.3%), 'lower stable weight' (n=2236; 54.1%), 'weight gain' (n=664; 16.0%), and 'weight loss' (n=478; 11.6%). Most patients (65.9%) had some weight loss by 8 months and then regained. After adjustments, weight losers were more likely than gainers to be older, be female, take fewer medications, have had nutritionist visits, and have lower mean glycosylated hemoglobin (HbA1c) levels. Weight losers were less likely to be in a race group at higher risk for obesity, have depression or dyslipidemia, or have taken more than 30 days of a sulfonylurea alone or in combination with metformin. **Conclusions:** Most diabetes patients lost some weight after diagnosis. Weight loss trajectories were strongly associated with better glycemic control when compared to weight gain. Patients with certain characteristics may need more support for weight loss, and most need support for weight loss maintenance.

Abstract C-A4-05

US Immigration is Associated With Obesity Among Asian-Pacific Hotel Workers in Hawaii

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Background/Aims: The Work, Weight and Wellness (3W) program is a randomized trial funded by the National Institutes of Health, National Heart, Lung and Blood Institute. The program aims to decrease obesity among hotel workers in Hawaii. In this study we examined patterns of obesity in relation to migration status and ethnicity at baseline. **Methods:** Four thousand five hundred thirty hotel workers in 31 hotels were measured for weight, height and waist circumference at baseline, prior to intervention. Ethnicity and place of birth were self-reported. Data analysis was done using SAS. **Results:** Forty-five percent of hotel workers were born outside of the U.S. Of hotel workers born in the U.S., 35% were born in Hawaii, while 9% were born on the U.S. mainland. Among hotel workers born outside of the U.S., 38% were born in the Philippines, 3% in Japan, 3% in Southeast Asia, 1% in other Pacific islands, and 12% in other locations. Self-reported ethnicity was 44% Filipino, 32% other Asian, 13% Pacific Islander, 9% White and 3% other ethnicity. The body mass index (BMI) of immigrants was 2.2 kg/m^2 higher than that of non-immigrants, on average, and waist circumference was 5.1 cm higher, on average. The BMI of males was greater than that of females and the interaction of sex and immigration on BMI was significant. The BMI of Pacific Islanders and Filipinos was greater than that of Whites, while BMI of Asians was lower than that of Whites; however, Filipino BMI was no longer greater than White BMI after adjusting for migration status and sex. Being immigrant, male and Pacific Islander was associated with greater BMI, while being Asian was associated with lower BMI. **Conclusions:** Birth outside of the U.S., male sex, Pacific Islander ethnicity and Filipino ethnicity were associated with obesity. Future study will examine the differential effects of the 3W intervention program on obesity, and if this was modified by migration status, sex and ethnicity.

Cancer

Abstract C-B1-02

Spiritual Quality of Life of Long-Term Colorectal Cancer Survivors With Permanent Intestinal Stomas

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Background: Religious and spiritual beliefs can influence adjustment to medical treatments and outcomes. This mixed methods cross-sectional study examined spiritual quality of life (QOL) of long-term colorectal cancer survivors with permanent intestinal ostomies. **Methods:** Men (n=88) and women (n=55) with ostomies whose total scores fell in the upper (n=71) or lower (n=72) quartiles of the validated City of Hope Quality-of-Life ostomy-specific (COHQOL-O) survey provided quantitative and qualitative data regarding spiritual dimensions of QOL. Analyses included chi-square and analysis of variance ± standard deviations with significances set at $P<0.05$. Content analysis was used to explicate meanings for spirituality items in survey narratives and focus groups. **Results:** The high COHQOL-O group was significantly more likely to be older (74±9 vs. 70±1.3, $P<0.01$) and married or partnered (72% vs. 55%, $P<0.03$). Upper quartile subjects had more favorable scores for the spiritual items Sense of Inner Peace, Hopeful, Reason to be Alive, and support from spiritual (e.g., prayer) and religious (e.g., church) activities compared to the lower quartile (all $P<0.0001$). The two groups did not differ for the item Positive Changes in life related to having an ostomy. Qualitative comments made by participants reflected the meaning of their high or low spiritual QOL scores. **Conclusions:** Spiritual

dimensions of QOL are significantly influenced by an intestinal stoma. Qualitative comments provided insight into the meanings and live experiences related to the spirituality items. Persons with ostomies report less inner peace, feeling less hopeful, not having a reason to be alive, as well as fewer spiritual and religious activities for coping. An understanding of these factors will facilitate integration of holistic care and treatment in this population.

Abstract C-B1-03

The Trustworthiness of Administrative Health Plan Data in Chemotherapy Research

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Background: Collecting chemotherapy administrations is important to any study of cancer treatment. However, abstracting data from medical records can be time consuming while chemotherapy data from tumor registries may be lacking sufficient detail. The goal of this study was to describe the accuracy of automated chemotherapy data from administrative health plan databases compared with data from tumor registries. **Methods:** From eight Cancer Research Network (CRN) tumor registries, we identified 1218 women diagnosed with primary ovarian cancer between January 2004 and June 2006. Using the Virtual Data Warehouse (VDW), we linked cases to all known automated chemotherapy administrations through June 2006 by pooling administrative health plan data from procedure, pharmacy, and diagnosis automated databases. We then calculated the sensitivity of these three data sources for capturing any chemotherapy administrations compared to chemotherapy as coded by tumor registries at each site. **Results:** The health plan data contained records of at least one chemotherapy administration in 51.3% of cases (range across sites 4.3%-80.0%) while the tumor registry data contained such records in 68.8% of cases (range 57.3%-95.2%). The overall sensitivity of administrative data compared to tumor registry data was 69.3% (range 2.9%-95.2%) and varied by administrative data source: 52.8% (range 0.0%-90.3%) using procedures, 46.5% (range 0%-80.7%) using pharmacy records, and 29.1% (range 0.0%-65.9%) using diagnosis codes. Sensitivity decreased over time from 81.4% among cases diagnosed January-June 2004, to 47.7% among diagnoses between January-June 2006. **Conclusions:** Tumor registries appeared to capture the chemotherapy administrations more often than automated health plan administrative data. We noted wide variability in the sensitivity of administrative data by site. Capture of administrative data may be enhanced through site-specific coding of chemotherapy administration and additional understanding at each site of clinical and billing coding practices.

Abstract C-B1-05

Development of an Instrument to Assess Comprehension of Spoken Cancer Prevention Messages

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Background: The ability to understand orally communicated health-related messages is a critical component of health literacy. Recent attention has focused primarily on the prevalence and impact of inadequate health literacy with regard to written communication, largely ignoring that the majority of health information is communicated orally. Most Americans rely on physicians or television for health information, but there is an alarming lack of information on how well people comprehend orally presented health information. We will report on our efforts to develop and validate a computer-based assessment of health literacy–oral around cancer prevention and screening. **Methods:** Our methods include a multi-step test development process, beginning with iterative team reviews of the dimensions to be considered in test development, a literature review and member interviews to identify potentially confusing terms and concepts, and collection of sample messages from the media and simulated physician–patient encounters to provide a basis for the actual test items. **Results:** Our process identified 13 dimensions to be considered in selecting and scripting the cancer prevention and screening messages that will be included in the assessment. Four of these dimensions are (1) the purpose of the message (instructional, informational/didactic, or query), (2) message style (narrative, statistical, or factual), (3) setting/context (messages available to the public, including those delivered via radio, television, or internet; messages delivered to the individual including messages delivered in physician-patient encounters, or in person or telephone encounters with other healthcare providers), and (4) content (e.g., cancer causes, screening, risk, epidemiology). The presentation will include full descriptions of all 13 dimensions with illustrative examples, the results of the iterative test specification process and sample items. **Conclusions:** We have successfully completed the first steps in developing a test to assess comprehension of health literacy oral in the context of cancer prevention and screening. The next steps include soliciting feedback on our methods and results to date, and suggestions for pilot testing and refining our materials.

Analytic Methods

Abstract C-B3-01

Data Quality Assessment of the Vaccine Safety Datalink Dynamic Data Files

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To enhance our ability to rapidly detect adverse events following immunization, the Vaccine Safety Datalink (VSD) developed dynamic data files (DDF). The DDF are created through weekly extracts of selected electronic medical records data at participating VSD HMOs. However, the timeliness and completeness of these files depend largely on the data storage capacity and infrastructure at each of the HMOs. VSD Data Managers produce a series of weekly, monthly, and annual reports to identify patterns that might signal a data quality problem in the DDF. All sites collect multiple weeks of event data during the weekly data extracts. To assess data quality, we can examine summaries of any particular week of event data repeated over multiple extracts. One data quality report summarizes the number of observations in a dataset for a given event week across multiple extracts, and calculates the percent change in observations across extracts. We used this report to estimate the number of weeks (or 'lag time') until the diagnosis and vaccination data at each HMO become relatively stable in the DDF. For each event week, we estimated the lag time until stability for outpatient diagnoses, inpatient diagnoses, and vaccinations in the DDF. Stability was defined as four consecutive extracts with less than 1% change (positive or negative) from the previous week. We created a set of criteria to define anomalous extract weeks and then imputed the percent change for these anomalous weeks in our estimation of lag time. Anomalous weeks included extracts in which datasets were not updated (i.e., the percent change across event weeks was 0%) and extracts in which the percent change across all event weeks was equal to 5%. The average lag time for outpatient diagnoses ranged from 3 to 19 weeks, and the average lag time for inpatient diagnoses ranged from 3 to 25 weeks across HMOs. The average lag time for vaccinations ranged from 2 to 26 weeks. Our findings suggest that the timeliness of diagnosis and vaccination data varies across the HMOs. In spite of this limitation, the DDF have proven to be a useful tool for rapid vaccine adverse event detection. Continuous data quality assessment of the DDF enables problems to be identified rapidly and either corrected or properly documented.

Abstract C-B3-02
Algorithm for Real-Time Identification of Blood Pressure Data Entry Errors Using Longitudinal Data From the Electronic Health Records

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Background/Aims: Data from electronic health records (EHR) are prone to error due to collection methods or human entry. However, historical measures can be used to validate subsequent measures. Real-time algorithms can be created that utilize longitudinal data to identify and require confirmation of questionable data during the patient encounter. **Methods:** We developed algorithms for identifying potential errors in the Geisinger Health System EHR. These were developed with two key principals in mind: (1) the algorithms should be relatively simple to program and implement, and (2) the identification of erroneous values should depend, to varying degrees, on both a patient's historical data and on data from the overall population. The more encounters the patient has had in the past, the more heavily the outlier cutoff values should depend on that patient's historical data. The algorithms were tested and refined on a sample of over 2 million systolic blood pressures from over 212,000 individuals. **Results:** The selected algorithm utilized prior measurements in the EHR and allowed for the possibility that the stability of the measurements might vary across subjects (e.g., the standard deviation might vary with the mean). The properties of the algorithm are described and are used to identify cutoffs for defining 5%, 1%, and 0.1% of the measurements as questionable data. Future studies are planned to test the usefulness of the algorithm in real time. In addition, these studies can be used to identify a cutoff threshold that results in an appropriate balance between flagging too many accurate values, and not flagging enough inaccurate values. **Conclusions:** An algorithm that uses historical blood pressure data can be used to identify potential errors during the patient encounter. The relatively simple algorithm does not require complex programming/software and likely can be tailored to optimize use by clinicians. The implementation of such an approach has the potential to improve the quality of EHR data.

Abstract C-B3-03
Applications of Mediation Analysis in Behavioral Medicine Research

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Background: In a typical regression model, the total effect of an independent variable (e.g., social support or strain) on a dependent variable (e.g., health status) is estimated. In mediation analysis, a regression model accounts for the possibility that the total effect consists of a direct effect and an effect mediated through a third variable (e.g., patient activation). We examined the potential mediating effects of patient activation between various psychosocial circumstances and health status, dietary intake, exercise, and obesity among a sample of adults in a group-model managed care organization (MCO). **Methods:** A mixed-mode survey (written and Internet options) was administered from October through December 2005 to 5309 MCO enrollees, 25-59 years of age, who were randomly sampled from 3 condition cohorts: (1) adults with type 2 diabetes, (2) adults with elevated lipids but no acute CVD history, and (3) adults with no major morbidities (low risk). The survey included previously validated measures of psychosocial circumstances that measured support or strain between patients and physicians (care delivery climate), among friends and family members (social climate), and among coworkers (work climate); patient activation (PAM-13); healthy behaviors (e.g., exercise, dietary intake); and physical and emotional health (SF-12). Using the approach of Baron and Kenney, linear and logistic regression models were estimated to compute the mediating effect of patient activation. The mediating effect was tested for significance using the Sobel test. **Results:** Twenty-two hundred twenty-four completed the survey (42% response rate). Forty-five percent of respondents were black; 60% were female. Adjusted for condition cohort and other patient covariates, psychosocial circumstances tended to have significant ($P<0.05$) total and direct effects on health status (better with more supportive climates), diet and exercise (better with more supportive climates) and BMI (lower with more supportive climates). Patient activation was a significant mediator (Sobel $P<0.05$) of the observed relationships between psychosocial circumstances and each of the three outcomes (health status, health behavior, and BMI) for all cohorts. **Conclusions:** Patient activation has an important mediating role between psychosocial circumstances and health and healthy behaviors, particularly with respect to social climate.

Abstract C-B3-04
Evidence-Based Medicine Integrator (EBMI): A New Simulation Architecture for Chronic Disease

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Background: Computer simulation models are increasingly used in complex chronic disease to prioritize treatments, study the effects of treatments, and guide policy and management. The accuracy of these models is doubtful, particularly in real-world use. **Methods:** We designed EBMI to 'think' as an evidence-based clinician thinks, by combining the best user-specified trial evidence about treatment effectiveness with the best possible individualized estimates of patient risk. Local validity is much more likely because EBMI's risk functions can be estimated from local data. The use of local data also allows the model to be used for real-time clinical prioritization in local settings. **Results:** EBMI reproduces Kaiser Permanente Northwest data very closely and, in its only validation to date against a clinical trial, closely replicated the Heart Protection Study. More validations and studies using the model are underway. **Conclusions:** It is possible to design a simulator that is both more evidence-based and more locally valid than existing models. EBMI and its source code are now available to other researchers, clinicians and managers.

Diabetes

Abstract C-C1-02
Factors Associated With Continued Inertia Among Patients With Diabetes

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Objectives: To estimate the prevalence of and factors associated with inertia among patients with diabetes. **Methods:** Using automated clinical and pharmacy data, we identified an insured cohort of patients with diabetes at the time they initiated oral monotherapy during the period, 2000-2005 (n=5082). Actuarial methods were used to estimate time to inertia (defined as 2 HbA1c values over 8% at least 90 days apart, not yet dispensed insulin with no medication change in the preceding 90 days). Among the subset facing inertia (n=1391), actuarial methods and Cox regression were used to estimate time to and factors associated with appropriate care defined as either a medication intensification (dose change, class change, or class addition) or an HbA1c $\leq$7%. **Results:** At inception, mean age of the cohort was 60.1 years, mean HbA1c was 8.6% and 97% were dispensed either Sulfonylurea or Metformin. Forty-eight percent were female and 37% African American. Eight percent of patients faced inertia within 1 year, 18% within 2 years, 26% within 3 years and 33% within 4 years. Before the time of inertia, 35% had been dispensed combination therapy. At the time of inertia, 20% had no medication on hand (i.e., were non-persistent in their medication use) and mean HbA1c was 9.7% (range 8.1%-18.9%). Mean time to appropriate care was 7.3 months, with 27% having neither an intensification nor HbA1c $\leq$7% within 1 year. Those with no medication on hand (hazard ratio (HR)=0.67; 95% CI, 0.56-0.82) and those who had progressed to combination therapy (HR=0.86; 95% CI, 0.76-0.98) faced longer delays. Increased delays were also associated with increasing drug co-payments (HR=0.95; 95% CI, 0.92-0.98). HbA1c levels greater than 11% (HR=1.48; 95% CI, 1.11-1.97) were associated with shorter delays, as were dispensings for an anti-hypertensive (HR=1.17; 95% CI, 1.01-1.37), lipid lowering (HR=1.19; 95% CI, 1.03-1.37), and anti-depressant (HR=1.46; 95% CI, 1.17-1.82)

medication. Increasing visit frequency to primary care (HR=1.85; 95% CI, 1.58-2.18) and endocrinology (HR=2.08; 95% CI, 1.45-2.97) were associated with decreasing delays, as were increasing income levels (HR=1.04; 95% CI, 1.00-1.07). **Conclusions:** Patients with diabetes facing inertia are at risk of further delays in appropriate management. Our findings suggest the presence of patient, physician and system barriers to appropriate care. Increased contact with the health care system may mitigate risk.

Abstract C-C1-03
Moving the Big N

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Background: Nationally the trend for hospitalization of diabetics has been slow to show improvement. In 2003, the rate of hospital discharge for diabetes as any-listed diagnosis (360.7 per 1000 people with diabetes) was only slightly lower than the rate in 1980 (398.7 per 1000 people with diabetes). Decreasing hospitalizations and improving health outcomes for 17,678 patients has been a system wide initiative in Marshfield Clinic since 2005. **Methods:** Numerous interventions have occurred since 2005 to improve health outcomes and decrease costs for the diabetes population. Evidenced-based guidelines were deployed and CME activities were created for providers. Clinical information support tools and applications deployed included wireless tablets for primary care providers and staff, an electronic point of care reminder tool, medication management and electronic planned care applications were also deployed. The diabetic foot exam process was standardized and medical assistants were trained to perform foot exams. Standing orders for staff to give influenza and pneumococcal vaccinations and schedule necessary lab tests or office visits were developed. Feedback on diabetes quality metrics at the organization, division, department and individual primary care provider level was provided every quarter on a rolling 12-month basis. **Results:** The all-cause hospitalization rate for persons with a diagnosis of diabetes has decreased from 360 per 1000 in 2005 to 317 per 1000 in 2007. This decrease in hospitalization lead to improved economic outcomes and quality of life by avoided hospitalizations. Conservative estimates of the cost savings range from $5,202,000 to $14,137,200. **Conclusions:** Significant improvement in this population has been demonstrated system wide by a decrease in all-cause hospitalization rates and composite diabetes process and outcome measures. Use of an electronic health record is essential but not sufficient to affect change. Ongoing measurement of practice performance has assisted in the change. Physician champions have been crucial for spread. Improvements are significant, however, opportunities remain.

Abstract C-C1-04
The Effectiveness of Diabetes Care Management in a Large, Integrated Delivery System: a TRIAD Study

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Background: Numerous studies have examined the effect of care management (CM) programs on diabetes outcomes such as A1c control. Most evaluations have been small randomized controlled trials; few studies examine how CM translates to real-world settings in terms of success at reaching target populations, or effectiveness for improving outcomes in large populations. The aims of this project are to assess the appropriateness of entry into a diabetes (DM) nurse-delivered CM program in Kaiser Permanente Northern California (KPNC) compared with program guidelines, to determine the proportion who meet program entry criteria, and to compare the trajectory of intermediate outcomes in patients who receive CM to that of similar patients who don't receive CM. **Methods:** KPNC automated databases were used to identify all DM patients from 2000-2005 and to determine whether patients enrolled in CM. We examined whether CM enrollees and non-enrollees met the eligibility criteria for the CM program. Using propensity score matching, we matched CM patients to similar patients who were eligible but did not enter CM. We compared trajectories of A1c, LDL-c, and blood pressure levels of CM patients to those of their matched controls, adjusting for baseline risk factor levels. **Results:** Between 2000 and 2005 less than 10% of all KPNC diabetes patients entered CM, representing approximately 25% of all eligible patients. Up to 22% of those in CM each year did not meet program entry criteria. CM patients were similar to the overall DM population in age, gender, blood pressure, and LDL-c levels; they had higher A1c and microalbumin levels. There were small but statistically significant differences in A1c, LDL-c, and blood pressure levels between CM patients and their matched controls 6, 12, and 15 months after program exit. There were significant improvements in CVD risk factor levels in all KPNC DM patients over time, regardless of whether or not they received CM. **Conclusions:** While eligibility guidelines for diabetes nurse care management were not strictly adhered to, care management did have a small but significant impact on intermediate outcomes. However, these improvements were small compared to the risk factor improvements over time in the overall DM population.

Abstract C-C1-05
Who Does Not Complete a First-Fill for a Diabetes-Related Prescription?

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Background: Research on medication adherence is primarily conducted using insurance or pharmacy claims data, focusing on patients who have already obtained their first prescription for a defined condition. Claims data alone cannot be used to assess first-fill rates. **Methods:** We conducted a retrospective cohort study that examined first-fill rates for patients prescribed medications to treat diabetes by linking prescribing information from electronic health records (EHR) to pharmacy claims data of one insurer. EHR data were obtained from the Geisinger Clinic, a large group practice serving a 31-county area of central and northeastern Pennsylvania. The Clinic includes 41 community practice sites with primary and multi-specialty care, all of which have used an EHR since 2001. Claims data were obtained from Geisinger Health Plan, a payer that accounts for 30% of Geisinger Clinic patient volume. Adherence was defined as a claim generated for the first-fill prescription within 30 days of the index date. **Results:** Of 1132 patients written a new, first-time prescription for any diabetes medication, 962 (85%) generated a corresponding claim within 30 days. Therapeutic class, refills, co-pay, baseline A1c values, and change in A1c values were associated with first-fill rates. Gender, race, age, comorbidity score, number of office visits, and number of medications prescribed had no association ($P<0.05$). **Conclusions:** Adherence relates directly to higher A1c levels and is associated with therapeutic drug class, higher number of refills, and lower co-pay. As expected, patients with higher adherence exhibited greater change in A1c levels. Patients with relatively lower baseline A1c levels, while at lower risk for diabetes complications, are at higher risk of not adhering to diabetes medications.

Abstract C-C1-06
Identifying Depression Among Diabetes Patients Using Natural Language Processing of Office Notes

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Purpose: To compare two methods for identifying depression among health plan enrollees with diabetes—administrative data base codes versus natural language processing (NLP) of office note verbal narratives. **Background:** In research studies in health care systems, depression cases can be identified through coded data in the health plan administrative data system, including diagnosis (ICD-9) codes and pharmacy codes. However, depression is often

under-coded. Clinician notes offer an alternative source for identifying depression. Natural language processing tools can be used to enhance case identification where clinician notes are available in electronic form. **Methods:** The sample was comprised of 2680 health plan enrollees that had received a new diabetes diagnosis within the previous two years. Using phrases that included the embedded term 'depress', two reviewers coded all cases with an appropriate indication of depression, excluding inappropriate uses of the term ('denies depression'; 'depressed fracture'; 'no history of depression'). On cases where there was disagreement, the two reviewers looked at the full note to determine the appropriate decision. The depression cases identified through the administrative database were compared to those identified through NLP in terms of clinical and demographic characteristics. **Results:** Of the 2680 incident diabetes patients, 260 (10%) were identified through both methods, and an additional 141 were identified with depression through NLP only. There were 37 depression cases identified through administrative codes with no NLP evidence of depression. There were no significant differences between NLP versus administrative data criteria in terms of gender, age, comorbidity, or A1c of those identified with depression. However, patients identified through the administrative system had more primary care visits and had longer continuous enrollment in the health plan. **Conclusions:** Use of NLP increased numbers of identified depression cases by almost a third. The NLP tool provides an efficient way to enhance the identification of depression cases, both for research and population-based quality improvement efforts. As more and more medical providers establish paperless offices, NLP will be an increasingly useful and efficient tool that can be used by both clinicians and researchers for a variety of purposes. This study was funded by NIH/NIDDK: Grant #DK066050.

Quality Improvement

Abstract C-C2-01

Guided Care: The Translation of Research Into Cost-Effective Primary Care for Persons With Chronic Conditions

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Background: 'Guided Care' (GC) is primary care into which several successful innovations in chronic care have been translated, in accord with the 'chronic care model.' This study examines the effect of GC on the quality of medically complex older adults' health care. A registered nurse based in a primary care practice and supported by a web-accessible, evidence-based electronic health record, works closely with 2-4 physicians in caring for 50-60 of their multi-morbid older patients. For each patient the nurse performs a comprehensive assessment at home and then collaborates with the physician, the patient and the caregiver to customize an evidence-based 'Care Guide' for healthcare professionals and a personal health 'Action Plan' for the patient and caregiver. Thereafter, the nurse monitors the patient's chronic conditions proactively, coaches the patient in self-management, smoothes transitions between settings of care, coordinates multiple providers, educates and supports caregivers, and facilitates access to community resources. **Methods:** Using claims-based predictive modeling, we identified the top 25% chronically ill older patients at highest risk for health care utilization in the subsequent year within three Kaiser Permanente practices. A total of six primary care teams representing 20 primary care physicians and 403 of their patients consented to participate in the trial of which three teams were randomized to receive a GC nurse. We assessed quality of care after 6 months using the Patient Assessment of Chronic Illness Care (PACIC), an instrument which measures self-reported quality of care in five domains. **Results:** Eighty-six percent of GC patients (n=204) and controls (n=199) responded to baseline and follow-up interviews. Patients receiving GC were two times more likely to rate the quality of their care as 'highest quality' compared to patients in the control group after adjusting for baseline sociodemographic characteristics, health status, functional ability, practice site, satisfaction with healthcare and PACIC score (OR, 1.99, P=0.054). GC patients had a significantly higher rating of care within the following domains: goal setting (OR, 2.55, P=0.003), coordination of care (OR, 3.09, P=0.006), and decision support (OR, 1.73, P=0.026). **Conclusion:** Preliminary results suggest GC improves the quality of care for complex, chronically ill older adults.

Abstract C-C2-02

iList (Intervention List) – Planning Care for a Large Population

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Background: Improvement of diabetes care for a population of 17,993 has been a system-wide initiative since 2004. Multiple strategies have been implemented to meet this aim. The Intervention List, also known as iList, is a software application that was introduced to help physicians and staff plan interventions at the individual patient level to improve care. iList contains lists of patients with diabetes who are not meeting quality metrics and may lack a follow-up appointment. **Methods:** Algorithms to identify high-risk patients who are not at goal for diabetes quality metrics and link them to personal care providers were developed by the Data Warehouse. iList was deployed to all primary care practices in the system. Standing orders were developed for staff to use in conjunction with iList to schedule necessary test or office visits. Training was held to assist staff and physicians in improving care through iList, a defect recovery list. In addition, the process of diabetic foot exams was standardized and support staff was trained to perform foot exams. **Results:** Significant improvement in diabetes care has been demonstrated by the improvement in the composite diabetes process and outcome measures. The percent of patients who have met all diabetes process measures has increased from 13.4% prior to iList implementation to 42.4%. The percent of patients who have met all diabetes outcome measures has increased from 10.1% to 19.1%. **Conclusions:** iList has helped physicians and staff to attach names to those patients in their practice who are not meeting all of the quality metrics and take action to improve care where there may be gaps. Awareness of the need to plan chronic care is not necessarily self evident and education of providers and staff has been helpful. Planning care builds trust with patients. Use of the application has emphasized the staffs' ability to help patients improve their health. Standing orders have facilitated the process of planning care. Planning care saves time and physicians recognize the efficiencies. Adaptive change needs to accompany technical change for successful implementation.

Abstract C-C2-05

Taking Advantage of Natural Experiments for Implementation Research: a DIAMOND Opportunity

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Background: Faced with the challenge of how research can help medical care cross the quality chasm separating what we think we know and what we actually do, new approaches and designs for research are needed. We especially need research that helps us understand problems in implementation and how to improve care. Since care and financing changes occur at an increasingly rapid pace, they provide huge opportunities for learning if we can only build and fund appropriate parallel research studies. This paper will describe such a study of a major statewide initiative to change the financing and care for depression in Minnesota. **Methods:** The DIAMOND (Depression Improvement Across Minnesota – Offering a New Direction) study proposal was developed in conjunction with a similarly named collaborative plan for changing the way all health plans and the state paid for primary care of depression and for facilitating care changes that would implement evidence-based care. The implementation was planned in a way that would be most feasible for stakeholders while also being compatible with a sophisticated quasi-experimental research design that involved staggered implementation with multiple baseline measures of practice systems, care processes, and patient outcomes. It also featured evaluation of changes in worker productivity and in healthcare utilization/costs while also measuring the extent of penetration through the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, and Maintenance). **Results:** The research proposal to NIMH

received a high score, and was funded in time to develop and implement the measurements before the changes began. Study measures required extensive cooperative efforts by the payers and medical groups, which were made possible by the ongoing integration of the initiative and the research and because all participants recognized the value of the measurements for assessing the effects and aiding decisions to maintain and extend the payment changes. **Conclusions:** It is possible to fund and evaluate even extensive change projects if developed collaboratively and flexibly with operational leaders in such a way as to provide information they value. Luck helps too.

Health Informatics

Abstract C-C3-01
Assessing the Use of an EMR Prompt for BMD Testing in Rheumatology

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Background: We conducted a multi-phase project to examine issues surrounding bone health following the Women's Health Initiative (WHI) findings. Phase One involved surveying women regarding behaviors and concerns related to menopause management, and Phase Two involved surveying providers regarding these same issues. In Phase Three we developed a bone mineral density (BMD) testing prompt within the electronic medical record (EMR). Phase Four assessed whether the prompt made a difference in the number of patients at risk who received BMD and/or a bone health medication. **Methods:** Rheumatology patients were our target population (key priority for the health plan). All patients were age 40+, on prednisone, with no record of BMD in the previous two years. The Prompt: The following message appeared in the EMR: 'This patient is at risk for osteoporosis due to prednisone use. We have no record of a recent Dexa scan.' Data was obtained on BMD testing, prednisone use and treatment within the following time periods: 6-3 months and 3-0 months pre-prompt and 0-3 months and 3-6 months post-prompt. The proportions for whom BMD testing was ordered and/or who were on a bone health medication were determined; data were analyzed to assess if percentages were the same, decreasing or increasing. rheumatologists were asked the value of continuing its use. **Results:** BMD testing proportions were quite low in all periods but showed a slight increase over time (from periods 3-0 months pre and 0-3 and 3-6 months post). The use of prednisone was the same over time. Bone health medication was fairly consistent with a very slight increase in percentage use over time. These figures did not reach statistical significance. Providers reported the prompt was more of a hindrance than a help; it could not be tailored enough where clinical intervention was relevant. Due to the lack of enthusiasm, we dropped the alert. **Conclusions:** While prompts to providers seem beneficial in theory, putting them into practice has challenges. Providers do not always find them adequately tailored and report that too many competing reminders become distracting.

Abstract C-C3-02
The Next Step: Achieving Health Behavior Change Through Technology

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Background: Web-based technologies offer an efficient patient-centered means of educating patients and improving their chronic disease self-management skills. Our objective was to engage patients in the use of an internet-based health behavior change program. **Methods:** We tested the effectiveness of a web-based behavior change application designed by HealthMedia, Inc. (HMI) in patients with cardiovascular disease, diabetes, and/or heart failure. Eligible patients were required to be registered users of MyGeisinger, a web-based patient portal used to access medical information, communicate with providers, and review test results. Patients randomized to the intervention group received multiple letters and e-mails inviting them to use HMI's behavior change tool. Control group patients did not have access to the HMI application. Given the low initial response rate (only 11.9% enrolled in the HMI application), we conducted a phone survey of 30 non-enrollees. The survey included 35 questions about internet usage, MyGeisinger usage, and reasons for not enrolling in the HMI system. **Results:** All respondents reported having access to an internet-connected computer. Ninety percent of the respondents indicated that they accessed the internet 2-7 times per week. Seventy percent of respondents reported that they were active users of MyGeisinger. The most common reasons for not using the HMI system included: not knowing the physician who signed the letter inviting them to participate in the study (67%), technical problems with the computer, website, login or pop-up windows (67%), and needing more information about the intervention (43%). **Conclusions:** The target population (i.e., comfortable using a web-based patient portal) for an internet-based behavior change tool was easy to identify. Several barriers remain to get these technology-savvy users to additionally adopt a web-based behavior-change application. In a separate analysis of MyGeisinger usage, 86% of the intervention group used MyGeisinger three or more times during a 12-month period. We conclude that motivating patients to use an electronic health tool that provides a platform for exchanging information (e.g., MyGeisinger) is fundamentally different from engaging patients in electronic health tools for health behavior change. There is a need to reduce and/or eliminate the technical hurdles and to develop better ways of providing information to prospective users about the purpose and benefits of web-based behavior change tools.

Abstract C-C3-03
Implementation of Electronic Decision Support for Providers to Improve Diabetes Care

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Background: An electronic decision support tool called Diabetes Wizard (DM Wizard) was implemented in four HealthPartners Clinics from October 2006 through May 2007 as part of the NIDDK funded study entitled 'Reducing Clinical Inertia in Diabetes Care.' The DM Wizard was integrated into the electronic health record (EHR) as an EPIC smart form and accessed through the visit navigator screen at a patient's encounter. It was also printed for provider review prior to entering the exam room. It gave clinically relevant data on the patient's A1c, blood pressure, lipids, and relevant comorbidities. In addition, it was programmed using complex algorithms derived through expert consensus to list 3-4 specific recommendations for drug intensification along with safety alerts and reminders for each of the three clinical domains. **Methods:** Sixty-one providers were randomized at the clinic level to one of three study arms: (1) Control (2) SimCare Plus (a simulated case-based learning program for providers) or (3) DM Wizard. Six clinics received staff training and, for 6 months, received feedback, utilization reminders and paid incentives for DM Wizard use. Providers also completed a 'visit action resolution' form (a checklist of reasons for clinical inertia). A provider survey assessed satisfaction. The following were tracked electronically during the 6-month intervention and incentive period, and for 3 months after: (1) rate of opening the DM Wizard at eligible encounters (all visits of patients with diabetes) (2) rate of nurse printing the DM Wizard for the provider (3) rate of provider completion of the visit resolution form. **Results:** One hundred percent of providers agreed with listed treatment suggestions and would recommend use of the DM Wizard to other physicians. The form printed by the nurse and available prior to entering the exam room was seen as valuable by most providers. The DM Wizard was opened during eligible diabetes encounters 75% of the time, with printing and visit resolution completion rates of 88% and 87% of opened forms, respectively. Three months after the incentive period, rates of opening the DM Wizard dropped to 50%. **Conclusions:** The DM Wizard EHR tool was implemented successfully with high provider use rates and satisfaction. Use declined substantially after the study intervention period correlating to discontinuation of feedback, reminders, and incentives. The cost of maintaining high rates of DM Wizard utilization and keeping algorithms up to date will need to be weighed against the clinical benefits achieved.

Abstract C-C3-04

Changing Prescriber Behavior Using Academic Detailing and Computerized Decision Support

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Background/Aims: Harvard Pilgrim Health Care (HPHC) is one of 28 Attorney General Consumer and Prescriber Grant Program grantees. Four HMORN CERTs sites, including HPHC, received grants. An overall goal of the Program is to identify best practices for educating clinicians about the influences on their prescribing and for changing their prescribing behaviors. At HPHC, our aim was to test the effectiveness of computerized clinical decision support (alerts), alone and in combination with group academic detailing, to reduce the use of heavily marketed hypnotic medications at Harvard Vanguard Medical Associates (HVMA), a 14-site group practice that uses the Epic electronic health record. **Methods:** We randomly allocated the 14 practices to three study groups: (1) Alerts Only (n=5 practices), (2) Alerts plus Detailing (n=5), and (3) Usual Care (n=4). Internal medicine clinicians in both the Alerts groups received prescribing alerts when initiating new prescriptions for eszopiclone (Lunesta), zaleplon (Sonata), ramelteon (Rozerem), and controlled-release zolpidem (Ambien CR) between March and December 2007. We carried out group academic detailing sessions in June and July 2007 followed by an educational mailing in the fall. **Results:** A pre-planned interim data analysis (August 2007) demonstrated that hypnotic study alerts were triggered on 98 separate occasions. After receiving an alert, 30% (95% CI, 21%-40%) of clinicians changed the prescription to an alternative recommended medication. We plan to extract post-intervention data in January 2008 and will present findings of the intervention at the HMORN meeting. In addition, we carried out pre-intervention and post-intervention surveys of all clinicians at HVMA in 2006 and 2007 which assessed clinicians' perceptions of the influences on their prescribing, with special attention to the role of direct-to-consumer marketing. We will present the results of these surveys, as well. **Conclusions:** Developing interventions using health information technology and group detailing to improve the use of medications is a high priority for many HMORN organizations. The results of this study should be generalizable to many HMORN sites, including but not limited to the many organizations that have deployed the Epic electronic health record.

Abstract C-C3-05

Electronic Support for Public Health (ESP): Automated Detection and Reporting of Notifiable Conditions

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Background: Legislation and good citizenship compel practitioners to report key diagnoses that affect the public good. Public health reporting, however, is frequently paper-based, incomplete, lacking key details, and delayed. We sought to leverage electronic medical record (EMR) systems to automate the detection and reporting of notifiable diseases to a health department. **Methods:** The Electronic Support for Public Health (ESP) system consists of an independent server within the central data processing center of Atrius Health, a large multisite medical practice with over 600,000 patients. The server is populated by nightly extracts generated by Atrius Health's Epic Care EMR. The extracts contain codified data on every patient encounter from the preceding 24 hours including demographics, diagnoses, lab orders, lab results, vital signs, vaccinations, and prescriptions. Relevant codes are mapped to standard nomenclatures. EMR data on the server is analyzed using novel algorithms to detect patients with notifiable conditions. When a patient is identified, an HL7 electronic message is securely transmitted to the state health department. The ESP server is deliberately decoupled from the source EMR in order to minimize interference with clinical computing, ease modification of case-detection algorithms, and permit compatibility with different proprietary EMR systems. The number and completeness of electronic case reports are compared to concurrent, conventional, paper-based reports. **Results:** ESP has been operational since January 2007 and has reported 1121 cases of chlamydia, 146 cases of gonorrhea, 25 cases of pelvic inflammatory diseases, and five cases of acute hepatitis A. Comparison with ongoing traditional reporting shows a 44% increase in the number of chlamydia and gonorrhea cases reported. ESP includes treatment details on 100% of reports versus 88% of manual reports and has noted 86 cases of concurrent pregnancy versus five in paper reports. Algorithms to detect additional disease are being validated. **Conclusions:** Automated analysis of electronic medical record data can increase the number, clinical detail, and accuracy of notifiable disease reporting. The architecture pioneered for this system can potentially support additional public health objectives such as novel vaccine or medication adverse event detection and reporting. Collaborators are invited to help refine the system and test implementation in a new site.

Abstract C-D2-01

The Use of Computerized Medical Records to Investigate the Association Between Diabetes and End Stage Renal Failure

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Background: In many countries diabetes-mellitus (DM) is a leading cause for end-stage renal-failure (ESRF). The objective of the current study is to demonstrate the use of computerized medical records to describe the association between the prevalence of ESRF patient needing dialysis and DM by using data from both types of patient populations. **Methods:** Data from an Israeli HMO were used to identify 57,030 DM-patients and 647 ESRF-patients. Nearly one-third (30.8%) of the ESRF patients had DM. **Results:** ESRF-patients <35 years had a 45-fold higher prevalence of DM compared to the general population. Overall, ESRF women had a weighted prevalence rate of 3.11 (95% CI, 2.63-3.68) for diabetes; a significantly lower prevalence rate of 2.03 was calculated for men (95% CI, 1.75-2.36; $P<0.05$). **Conclusions:** The present study demonstrates the potential of harnessing large computerized medical databases to provide epidemiological data about the association of important chronic diseases which can be used to explore and improve the quality of disease management of DM and ESRF patients, and for health service planning and research.

Abstract C-D2-03

Family Health History: New Standards and Enhanced Utility for a Valuable Preventive Tool

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Background: Family health history (FH) is an underutilized tool in healthcare and could play a central role in enhancing the use of preventive services for a variety of disorders of major public health importance. Existing clinical prevention guidelines for screening and management of disorders incorporate FH information. Unfortunately, obtaining a FH is time-consuming and many primary care providers are insufficiently trained to effectively interpret the information they obtain. Studies show that clinicians often neglect FH in the context of healthcare visits. A potential solution would be the development and widespread adoption of interoperable health information technology (HIT) systems that facilitate patient entry of FH information and provide automated clinical decision support for

clinicians. **Methods:** The American Health Information Community (AHIC) is a federal advisory body organized to make recommendations to the Secretary of the US Department of Health and Human Services on how to accelerate the adoption of HIT. In July 2007, AHIC advanced recommendations to improve electronic health information exchange via the implementation of standards for FH information. The first step to developing interoperable HIT systems for the collection, interpretation, and exchange of FH information is the development of a widely accepted core minimum dataset for FH. To this end, the Personalized Healthcare Workgroup of the AHIC assembled the FH Multi-Stakeholder Workgroup to develop a minimum core dataset. The workgroup is comprised of over 40 members representing approximately 18 different public and private organizations with expertise in the area of FH, HIT, and healthcare delivery. **Results:** The FH core dataset for primary care was developed using an interactive, iterative process that used the proposed standards for FH information contained in the Continuity of Care Record (CCR) as a foundational document. Some key features of the core dataset are, FH information should be collected in a structured manner that permits the generation of a pedigree, age of disease onset should be collected, and self-identified race and ethnicity data should be included as FH information. The document outlining the requirements will be made available for public comment in early 2008. **Conclusions:** The document should serve as a solid foundation for public and private efforts to create HIT systems and demonstration projects examining the utility of interoperable FH information in clinical and research settings.

Abstract C-D2-05

Creation of State Legislation to Protect and Facilitate Use and Exchange of Electronic Health Information

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Background: In examining potential barriers to implementing a statewide health information exchange in NM, we identified as a key barrier NM's laws regarding the protection of health information. The laws are fragmented and dated, adopted prior to HIPAA, and address only health data in paper-based formats. Enactment of specific state legislation authorizing transmission, use, and exchange of electronic health information would eliminate the detrimental effects of the existing state laws. **Aim:** To develop and pass comprehensive state privacy legislation in New Mexico governing the use, storage, and exchange of electronic health information. **Methods:** Review of health privacy legislation nationally, interviews with privacy experts, development of a draft of the legislation, and solicitation of input from a variety of stakeholder groups to identify controversial areas of the legislation and to garner legislative support were performed. Key privacy experts (e.g., legislators, healthcare providers, and attorneys) discussed their concerns and opinions about electronic transmission of health information. Attorneys researched privacy legislation in other states and drafted NM's Electronic Health Information Act. This draft was examined and discussed with numerous stakeholder groups to determine needed revisions. **Results:** Interviews with key privacy experts and stakeholders revealed conflicting points of view concerning the legislation, especially regarding issues of patient consent. Patient privacy advocates strongly favored patient control of access to their health data and more restrictive rules for patient consent than required by HIPAA. In contrast, providers, payers, and advocates for health information exchange networks typically favored less restrictive patient consent (consistent with current HIPAA regulations) to avoid additional time, burden, expense, and delays in implementing health information exchange. Review of legislation in other states revealed only Minnesota and Nevada have enacted laws specifically addressing electronic health information exchange. **Conclusions:** Current NM legislation (and legislation in most other states) does not adequately address the use and exchange of electronic health information. Current efforts to develop health information exchange networks in NM and elsewhere require resolution of key patient privacy issues and the passage of appropriate legislation. Funded by the Agency for Healthcare Research and Quality.

Health Economics

Abstract C-C4-01

Prevalence-Based Costs of HIV-Positive Patients With Multiple HAART Switches

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Background/Aims: Highly active antiretroviral therapy (HAART) successfully treats patients with HIV. However, many patients do not achieve complete suppression. Perhaps the most important reason for treatment failure is infection with antiretroviral drug-resistant variants, which threatens to increase treatment cost as well as limit HAART's clinical effectiveness. This study examines the resource utilization and cost implications of multi-drug resistance using the HIV+ population of Kaiser Permanente Northern California (KPNC). **Methods:** Retrospective cohort analysis of all HIV+ patients in KPNC between January 2000 and June 2005 (total study period). Continuous active membership of 12 months and minimum 12 months of continuous HAART. Cases defined as HIV+ patients on third or later HAART regimen; controls defined as HIV+ patients on first or second HAART regimen. Regimen switch defined as combination change of two or more additions or subtractions of antiretroviral therapy (ART) drugs to or from an existing HAART regimen. Costs include outpatient, inpatient, and pharmacy categories. **Results:** All results are for 2004 only (291 cases, 1,676 controls); costs reported in person-years. Mean total pharmacy costs were $17,668 for cases vs $12,417 for controls ($P<0.04$). Of mean pharmacy costs for cases, 85% were ART-based (controls=90%). Mean number of 2004 fills for both ART and non-ART drugs were higher for cases (20 vs 15 for ART; 21 vs 15 for non-ART). Mean total outpatient costs were $3,275 for cases vs $2,238 for controls ($P<0.06$). Mean ER visits and mean primary care visits, but not specialty care visits, were both higher for cases than for controls ($P<0.03$). Mean inpatient costs were $3,803 for cases vs $1,738 for controls. Mean number of stays was higher for cases than for controls (0.29 vs 0.16; $P<0.05$), but length of stay did not differ between groups. **Conclusions:** In 2004, patients with HIV on at least their third HAART regimen incurred mean pharmacy costs 40% higher than similar patients on first or second regimen. Outpatient and inpatient costs also appear higher among cases, but not strikingly so. Overall cost differentials between cases and controls may be underestimates, as laboratory, radiology, and home health have not yet been added. These cost categories may well widen the cost differences between HIV+ patients who have been forced to switch HAART regimens more than once relative to those who have not.

Abstract C-C4-04

Entering and Exiting the Coverage Gap by Medicare Part D Beneficiaries With Diabetes: a TRIAD Study

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Background/Aims: Many Medicare Part D enrollees face gaps in their prescription drug cost coverage after $2,250 in annual drug expenditures. Beneficiaries with chronic illnesses may be particularly vulnerable to coverage gaps, with estimates ranging as high as 64% of diabetic beneficiaries entering the gap. We examined total drug costs and out-of-pocket drug costs, and rates of entry and exit into the Part D coverage gap for beneficiaries with diabetes in two large California Medicare Advantage plans. **Methods:** Beneficiaries from two large health plans in the TRIAD (Translating Research Into Action for Diabetes) Study offering Medicare Advantage Part

D plans in California were included if they had diabetes; signed up for Part D between November 15, 2005 and March 1, 2006; and had a drug coverage gap starting at $2,250. Entry and exit into the gap was determined using pharmacy databases. Beneficiaries hit the gap after incurring $2,250 in total drug costs; beneficiaries exited the gap after incurring $3,600 in out-of-pocket costs. **Results:** In 2006, 25% of the 45,732 beneficiaries reached the coverage gap and then paid the full price of their drugs. Only 1% of beneficiaries exited the gap and qualified for 'catastrophic' drug cost assistance. On average, diabetes beneficiaries incurred $1,942 in total drug costs during 2006. For beneficiaries who did not enter the coverage gap, total drug expenditures and out-of-pocket drug expenditures remained stable over the year. For the beneficiaries who fell into the drug coverage gap in 2006, total drug costs were much higher overall and decreased over the year as out-of-pocket expenses increased. **Conclusions:** This is the first examination of diabetic Medicare beneficiaries under the Part D program. Fewer entered the coverage gap than had been previously estimated. Those entering the gap, however, had lower subsequent monthly drug expenditures. Potential reasons for both include lower than expected drug prices or drug adherence and higher than expected use of less expensive drugs, such as generics. Future work will examine these alternative explanations and explore risk factors for entering the Part D coverage gap.

Cardiovascular Disease

Abstract C-D1-02

Disparities in Patients' Ability to Participate in a Web-Based Intervention to Improve Blood Pressure Control

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Background: Electronic medical records and Web communications bring new opportunities to provide healthcare. Still unknown is whether this type of care will improve health outcomes and its affect on utilization and costs. Care in this environment may also be limited by the 'digital divide' between users and nonusers of Web communications. 'Electronic Communications and Home Blood Pressure Monitoring (e-BP)' is a randomized controlled trial designed to test the effectiveness of home BP monitoring, Web communications (secure patient e-mail that interfaces with an electronic medical record shared between patients and providers), and pharmaceutical care to improve hypertension control. We describe the proportions and characteristics of hypertensive patients willing and able to participate in an electronic healthcare intervention. **Methods:** Patients with uncomplicated hypertension received mailed invitations, a telephone survey, and in-person visits to determine their eligibility and willingness to participate. Eligibility requirements included access to a computer, the Internet, and an e-mail address. We performed a cross-sectional study on the subset willing to answer the telephone survey (n=7286), evaluating demographic differences between three populations: (1) those ineligible due to at least one computer access reason; (2) those eligible based on computer access, but not enrolled in the study for other reasons; and (3) those eligible and enrolled. We ran Pearson's chi-square test to evaluate bivariate associations. All *P*-values were two-sided. **Results:** Of those answering the telephone survey, 78% had computer, Internet, and e-mail access. These patients were significantly more likely to be male ($P<0.001$), younger ($P<0.001$), Caucasian ($P=0.01$), more educated ($P<0.001$), employed ($P<0.001$), and with a commercial healthcare plan ($P<0.001$), but no more likely to have a home BP machine. Enrolled patients with computer access and uncontrolled hypertension were not more likely to be male, but otherwise they were similar to those with computer access but not enrolled for other reasons. **Conclusions:** Most patients we contacted with hypertension had computer, Internet, and e-mail access, but a 'digital divide' persists. Chronic disease disproportionately affects older people, racial minorities, and those with less education. If electronic healthcare is to be effective in improving chronic disease health outcomes, additional efforts will be required to include these patients.

Abstract C-D1-03

Atrial Flutter is an Independent Predictor of Increased Mortality During Long Term Follow-Up

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Background: Atrial flutter (Afltr) and atrial fibrillation (Afib) are the two cardiac arrhythmias most frequently encountered in medical practice. Unlike Afib for which epidemiologic data paved the way for clinical trials that subsequently revolutionized its treatment, little is known about the course of the estimated 200,000 new cases diagnosed with Afltr in the U.S. every year. The purpose of this investigation was to determine whether Afltr is an independent predictor of death. **Methods:** Using the Marshfield Epidemiologic Study Area, a database that captures nearly all medical care and deaths among its 58,820 residents, we identified all patients newly diagnosed with Afltr in the region from July 1, 1991, through June 30, 1995. Incident cases were age and gender matched with controls and all were followed prospectively. To minimize the potential contribution of associated comorbidities, the analysis was limited to incident Afltr cases without Afib and adjusted for 11 pre-existing risk factors selected *a priori*; age, gender, stroke, myocardial infarction, heart failure, hypertension, rheumatic heart disease, hyperlipidemia, chronic pulmonary disease, diabetes mellitus and thyroid abnormality. Multivariate Cox models were fitted to obtain hazard ratios and 95% confidence intervals. **Results:** A total of 1356 person-years of follow-up were completed in 76 patients and 76 controls. There were 54 deaths (71%) among Afltr group and 37 deaths (49%) among controls ($P=0.0079$). After adjustment, the risk of death among incident cases with Afltr was 1.5 times that of controls (Hazard Ratio=1.56; 95% Confidence Interval: 1.01-2.41, $P=0.04$). **Conclusions:** (1) Our data suggest that Afltr is an independent predictor of death. (2) Since Afltr can now be easily and safely cured in the outpatient setting in virtually all patients, if our findings can be reproduced in other populations, consideration should be given to conducting prospective randomized trials to determine whether eliminating Afltr can improve survival in these individuals.

IRB

Abstract C-D4-01

IRB Review of Multi-Institutional Research

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Statement of the Problem: Because IRB review of multi-institutional research can involve as many IRBs as there are institutions participating in the research, the process can be frustrating, time-consuming, and unnecessarily iterative for both IRBs and researchers, and can also possibly cause researchers to miss funding opportunities. **Definition of the Intended Outcome:** Among a network of 16 affiliated large organizations engaged in significant epidemiologic research, each with its own IRB, arrive at a method to improve the IRB review process of multi-institutional research, while at the same time, assuring that regulatory and policy requirements are met. **Description of Program:** Determine which group of low-risk data-only studies will be used to beta test the new approaches to IRB review of inter-institutional research. Communicate with involved researchers, IRB Chairs, and IRB Administrators to discuss the review process options to determine the approaches to be tested. Evaluate the processes used for the review of each study and modify process as appropriate for the next study. Inform Chairs and Administrators of the results of each test. Recommend an approach for adoption by all members of the network. **Evaluation Method:** Testing of procedures currently underway. **Suggestions:** When completed, this process may prove adaptable to others engaged in multi-institutional research review.

Poster Presentations

Abstract PS1-01
The 21st Century Research Library: An Evolutionary Model for the Diffusion of Knowledge

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Background/Aims: The past decade has been a time of tremendous social, economic, and institutional change for the research community. Transformations in libraries mirror these transitions as libraries embrace new technologies and adjust to the shifting priorities of parent institutions. In the process, research libraries are becoming more committed to the creation and dissemination of knowledge through collaborative development, interdisciplinary scholarly alliances, open access measures, and user participation, reflecting a reversal from traditional proprietary operations. Through this evolutionary path, research libraries are emerging as more effective agents for the diffusion of knowledge in the research community. **Methods:** Within the changing environment of the 21st century, research libraries are seeking to understand the new ways in which clients search for and use information. Emerging web technologies and digital information resources have created an expanding base of users and have generated new service demands. Libraries are facing these challenges through more efficient resource sharing arrangements and by targeting and creating new user groups via digitalized content and electronic services. **Results:** Significant change and innovation are occurring in research libraries of all sizes and characteristics. These transformations can be summarized as: the expansion of electronic resources and Web 2.0 technologies; a redefinition of collection development; the development of tools to enhance user access; reconfiguration of library space to support learning and research; an emphasis on instructional technology services and information literacy; and the assumption of leadership in scholarly communication and publication issues. **Conclusions:** The extraordinary pace of the information technology evolution is likely to continue and accelerate, resulting in new opportunities for information dissemination. The research community will benefit from an awareness of and support for the library's innovative efforts.

Abstract PS1-02
A Database-Driven Approach to Producing PHS-398/2590 Other Support and Biosketch Research Support

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Background: Preparation of timely and accurate PHS-398/2590 Other Support (OS) and the Research Support component (Section C) of the PHS-398 biosketch can be challenging. Project information for investigators needs constant updating as projects are funded and completed. Responsibility for creating and maintaining Other Support and Research Support information typically spans multiple individuals and departments, including the investigator, administrative and project support staff, and business services, and generally no one has all the required information. Although there are commonalities between Other Support and Research Support, there are also significant differences and the two are not directly interchangeable. **Methods:** Center for Health Research (CHR) enhanced an existing Microsoft Access database used for project lifecycle tracking to collect the common elements for investigator Other Support and Research Support. The enhanced database includes: PI, project title and alias, funder, grant number, a concise project description, annual project dates and direct costs, roles and yearly FTE for key personnel associated with the project, and overlap statements. Also included is an entry screen that captures and allows editing required information, and queries to produce formatted MS Word output for Other Support and Research Support. **Results:** CHR will make available a CD-ROM version of the database preloaded with sample data, entry screen, queries, and examples of formatted output to HMORN members. A summary discussion of NIH policy and guidelines for Other Support and biosketches, along with use of tools such as the eRA Commons, CRISP, and the Notice of Grant Award to populate fields will also be presented. **Conclusions:** A database-driven strategy allows key project information to be entered and maintained in a single location. Accurate and correctly formatted Other Support and biosketch Research Support can then be generated for multiple investigators with a touch of a button. Programming logic separates projects as active, pending, or completed within 3 years of the query date. MS Access and MS Word are common business tools at most sites, so this system is essentially cost-free and can easily be maintained and modified by persons without extensive programming expertise. After an initial time investment in populating the database, significant labor savings and an increase in accuracy can be expected compared to a manual system.

Abstract PS1-07
A Laboratorian's Lamentations Over LOINC

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Background: The increasing need to transfer data from the performing laboratory to hospitals, clinics, utilization management reviewers, clinical researchers, public health workers and others that use laboratory data requires a level of standardization that is inherent in neither data traditionally produced by the laboratory nor reporting information system. Portability and merge-ability of the data is essential to conduct multi-site clinical trials and epidemiological studies. Comparing or combining lab results performed in different laboratories, which is integral to the Virtual Data Warehouse (VDW) of the Cancer Research Network (CRN), is challenging. Barriers include locally defined test codes. Most codes are easily recognized, such as K+ for potassium, others are less intuitive. It is also common to find normal ranges of different labs to be significantly different. This creates difficulties when trying to combine into one dataset for analysis as the values are not necessarily equivalent. This was historically addressed by using indirect criteria to compare data from different sites instead of absolute criteria. The INR for prothrombin time (PT) is an exception as the World Health Organization directed a massive standardization effort for PT in 1983. LOINC was designed to address these relational issues. The feasibility of using LOINC for the standardization of lab tests in the VDW is being explored. This report describes the strengths and limitations of using LOINC at Henry Ford Health System (HFHS). **Methods:** Regenstrief Institute's RELMA program was used on lab data to test LOINC implementation. The process of mapping test code to LOINC was manual and iterative, but the resulting file contains sufficient detail to create a one-to-one relationship between data sources. **Results:** The introduction of LOINC to laboratory databases allows the known methodological nuances to become part of the reported lab result. Nearly 31,000 of the 41,000 LOINC observation codes pertain to laboratory testing. **Conclusions:** It is advantageous to model the VDW databases to conform to LOINC in structure and nomenclature. Designing our data to universal standards will facilitate use in healthcare informatics. This process will require a person with considerable laboratory knowledge to accomplish accurate LOINC implementation. Coding complexities and redundancies require thorough investigation to determine appropriate LOINC codes are selected for data retrieval.

Abstract PS1-08
Using the Virtual Data Warehouse for a Multi-Site Study to Examine the Association Between Chemotherapy and Stroke

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Background: The Cancer Research Network (CRN) developed the Virtual Data Warehouse (VDW), a locally maintained dataset with consistent data content and structure across the CRN member sites. The VDW was used to conduct the multi-site study, 'Is Stroke a Late Effect of Chemotherapy?' The administrative and data extraction processes used to conduct the study are described. **Methods:** Four CRN sites participated in this 'data-only' study: Henry Ford Health System (HFHS) in Detroit, MI, Group Health Cooperative (GHC) based in Seattle, WA, Kaiser Permanente Colorado (KPCO) in Denver, CO, and Kaiser Permanente Northern California, with overall efforts led by a non-CRN site, Wake Forest University in Winston-Salem, NC. Four sites contributed data, HFHS served as the programming site, and WFU

served as the data coordinating and analysis center (DCC). Sites obtained Institutional Review Board (IRB) approval. The VDW tables accessed included Tumor Registry, HMO Enrollment, Diagnoses, and Pharmacy. The CRN study programmer wrote SAS programs for identification of cancer cases, covariates, and stroke outcomes. The VDW programs were beta tested by a second study site. After testing, the programs were provided to the remaining two sites for data retrieval. The programs transformed the data into an entirely de-identified dataset by calculating cancer diagnosis date and all other dates to 'age in days'. The resulting data files were transferred to the DCC using the CRN secure file transfer protocol. **Results:** Four different levels of IRB approval were necessary across the five sites, indicating local differences in interpretation of human subjects' requirements. The VDW program development period at the lead programming site required two months, after which data were available. Beta testing took two days to complete. The third site, which ran as a 'plug and play' after beta testing worked out some additional issues requiring slight program modifications. The time from posting the final VDW program to upload of study data took less than one week for the two sites with mature VDW structures. The fourth site delivered data within three months. Preliminary analyses were generated within one month. **Conclusions:** Using the VDW provided efficiency for labor, cost, and time. Such studies increase the overall value of the VDW as the skills of users improves.

Abstract PS1-09

The Feasibility of a Feasibility Study: Using the VDW to Assess the Diffusion of Ovarian Cancer Treatment

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Background: The Virtual Data Warehouse (VDW) has potential for studying diffusion of proven cancer treatments within the Cancer Research Network (CRN). Assessing the feasibility of VDW diffusion studies is important in guiding the development and conduct of future studies. The purpose of this study was to assess the feasibility of a low-budget, multi-site CRN feasibility study using the VDW to evaluate the diffusion of intraperitoneal chemotherapy among women with ovarian cancer. **Methods:** Using an online open-ended survey, project staff answered eight questions about the issues and challenges they experienced in conducting the study, including VDW-related data pulls and medical chart abstractions. For each question, we asked whether and how they resolved these challenges. **Results:** We received responses from staff at all eight sites (n=19). Having one macro VDW program developed at one site and run at the other sites was recognized as an efficient process. Issues related to the VDW included site-specific homegrown codes, limited data sources, and source data values. Some sites did not have VDW formatted data. Concerns related to the chart abstraction included the lack of a separate instruction guide and having numerous site specific data sources. Insufficient funding was cited often and some sites overspent their budgeted allowance (mostly for chart abstraction). The responses included issues related to the scientific aspects of the study that the respondents felt were not adequately resolved, partly due to lack of regular communication and conference calls. Several respondents commented that the project team did the best they could under the financial and time constraints. **Conclusions:** A low-budget, multi-site feasibility study using the VDW may be feasible, but has a number of significant limitations. The utility of the VDW remains variable across sites and data sources are not uniform; the inclusion of chart abstractions for validation required more effort than anticipated; and scarce project team conference calls limited discussion of methodological and scientific aspects of the study. Future VDW studies should carefully assess the data available from automated sources at each participating site, budget sufficient time for medical record abstraction and provide adequate funding for investigators, programmers, and medical record abstractors.

Abstract PS1-10

Impact of Pre-incentives on a Web-Based Follow-Up Survey

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From many previous studies, we have learned that sending a $2 bill in an invitation letter to participate in health research increases the likelihood of participation. In the Guide to Decide Study, thousands of women were invited to log on to a Web site to answer a baseline questionnaire, and they were mailed $10 as a thank you when it was complete. Most of the women were exposed to a decision aid that gave them risk information about using tamoxifen or raloxifene as a prophylactic for women with increased risk for breast cancer, and they were asked to return to the Web site 3 months later to complete a follow-up survey. A control group of women were promised access to the decision aid if they returned to the Web site to complete a follow-up survey 3 months after enrollment. One theory would suggest that women who received access to the decision aid at baseline would be more engaged and therefore more likely to return to the Web site to complete the 3-month follow-up questionnaire. Another theory would suggest that women who were not given access to the decision aid would be most inclined to return after 3 months to do so. This poster will illustrate whether there is a difference between a $2 and $5 pre-incentive when mailed in a letter to participants inviting them back to answer survey questions 3 months following their enrollment. Further, we will test whether the amount of the pre-incentive and the corresponding response rates differ between the intervention group and the control group.

Abstract PS1-11

Patient-Centered Communication Research in Integrated Delivery Systems

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Background: Considerable differences exist between the ways in which communication is conceptualized in the academic field of communication studies, on the one hand, and in clinical practice, on the other. Theorists in the field of communication studies have conceptualized communication as (1) mutual and interactive, (2) concerning the establishment of shared meaning, and (3) multilevel and embedded in organizational and institutional systems. Healthcare practitioners have tended to operationalize communication as (1) directional, (2) concerning the transmission of information, and (3) dyadic in terms of physician-patient consultation. **Methods:** A literature-based theoretical review focusing on the academic field of communication studies. **Results:** Loosely-coupled organizational systems can excel at locale-specific innovation while failing at horizontal coordination and organizational learning. Bureaucratic tendencies of complex organizations are inherently dehumanizing. In integrated healthcare delivery systems, attaining and maintaining a state of patient-centeredness will require continual vigilance. **Conclusions:** Patient-centered communication extends beyond the context of physician-patient interaction to include provider-to-provider communication, healthcare team coordination, applications of electronic medical records, intraorganizational issues of continuity of care, and interorganizational issues of patient-centered communication policy dissemination. A research agenda about patient-centered communication for integrated delivery system researchers is proposed as a means for systematically improving patient-centered communication.

Abstract PS1-12

Self-Efficacy and Attendance as Predictors of Weight Loss Following a Group Intervention

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Background: Self-efficacy in a specific area has typically been shown to predict actual success in goal attainment. However, in the dieting area there have been inconsistent findings regarding the relationship between self-efficacy and weight loss. Therefore, the main aims of the current study were (a) to test the success of a short-term group intervention in achieving weight loss, (b) to test whether participation in the intervention improves self-efficacy, (c) to test whether eating-related self-efficacy predicts weight loss in this program, and (d) to examine whether attendance in more sessions of the program is related to increased weight loss. **Methods:** The study followed up on a group intervention aimed at lifestyle changes, which took place at the Maccabi HMO and was facilitated by trained dietitians. The group method was based on nutritional skills coaching (e.g., planning a balanced diet, incorporating behavior and lifestyle changes). There were 190 participants in 19 groups of a 10-session program who took part in the study. Participant mean age was 45 years (SD=12 yrs), 92% were female and 60% had post-high school education. Participants filled in the Eating Self-Efficacy Scale at the second and last sessions, and provided self-reported weight by phone 3-months and 12-months post-intervention. Group facilitators measured height and weight, and noted attendance at each session. **Results:** BMI significantly decreased from the first session (mean BMI=31.4) to the last one (BMI 30.4). Weight loss (calculated as change in BMI) was retained; further non-significant decreases were seen at 3-months (BMI=30.1) and 12-months (BMI=29.8). Participants attended an average of 7.5 sessions and increased attendance was correlated with greater weight loss (r=0.20, $P<0.05$). Eating self-efficacy (in emotional states and social situations) significantly improved during the course of the group intervention. Initial low emotions-related self-efficacy was related to higher initial BMI but only initial low social-situations-related self-efficacy was related to weight loss. Higher goals at program outset were linearly related to greater weight loss. **Conclusions:** The short-term group intervention was successful in attaining weight loss and improving self efficacy. Participants who initially had difficulties in controlling overeating in social situations benefited the most from the program. Attendance in more sessions of the program was found to be related to increased weight loss.

Abstract PS1-13

High Five for Kids: Predictors of Participation in a Clinically-Based Obesity Prevention Intervention

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Aim: To examine predictors of participation in an obesity prevention trial among preschool-age children. **Method:** High Five for Kids is a cluster-randomized controlled trial of a planned 500 children in 10 primary care pediatric offices. Eligible children are 2-6.9 years old with BMI >95th percentile (obese), or 85th-95th percentile (overweight) if at least one parent is overweight. The initial intervention period is 12 months, with a 1-year follow-up period, and the primary outcome is BMI. Through screening of electronic medical records, we have identified and contacted 766 age-eligible and BMI-eligible children to date. We recruit parents via telephone following an introductory letter. We interviewed 220 of 306 (72%) parents who refused participation (refusers). **Results:** Parents who refused participation (n=220) did not differ from those who participated (n=470) by education (62.8% vs 55.3% with college degree, $P=0.07$) or by the number of children at home (2.2 vs 2.3, $P=0.21$). Children of parents who refused participation did not differ from those who participated by age (4.5 yrs vs 4.6 yrs, $P=0.65$) or sex (48.1% vs 44.5% female, $P=0.36$). The two groups did differ by proportion of children in BMI category (63.6% vs 52.9% overweight and 36.4% vs 47.0% obese, $P=0.009$). After adjusting for parent education level, number of children at home, and child age and sex, we found that parents were 53% more likely (OR=1.53; 95% CI, 1.10-2.14) to participate if their children were obese vs. overweight. Among the 80 refusers with obese children, 27.5% cited as a reason for refusal that their children did not have a problem with weight versus 37.9% among the 140 refusers with overweight children. **Conclusions:** Overweight parents of preschool-age children with a BMI 85th-95th percentile are less likely to have their children participate in an obesity prevention trial than parents of children with BMI >95th percentile. One reason appears to be that they less frequently consider their children to have a weight problem.

Abstract PS1-15

Assessment of First-Fill Adherence Rates For Patients With Hypertension Using Linked EHR and Claims Data

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Background: Much of the distance between the promise of evidence-based medicine and reality of improved patient outcomes can be attributed to problems in the 'last mile,' or patient adherence – the extent to which a person's behavior coincides with medical or health advice. Studies of prescription adherence have been hampered by methodologic problems. Most rely on patient self-report of adherence or cross-sectional data of plan-wide prescription fills to estimate patient-level adherence. We used a unique combination of electronic health record (EHR) data from clinics and prescription claims data to understand first-fill rates for hypertension and factors associated with first-fill behavior. **Methods:** We conducted a retrospective cohort study and linked individual patient data for new (i.e., first-time) prescriptions of medications for hypertension from EHR, with claims data obtained from an insurance plan. EHR data were obtained from the Geisinger Clinic, a large group practice serving a 31-county area of central and northeastern Pennsylvania. The Clinic includes 41 community practice sites with primary and multi-specialty care, all of which have used an EHR since 2001. Adherence was defined as a claim generated for the first-fill prescription within 30 days of the index date. **Results:** Of 3240 patients written a new, first-time prescription for any antihypertensive medication, 2685 (83%) generated a corresponding claim within 30 days. Gender, age, therapeutic class, number of medications prescribed within 10 days of prescription, number of refills, co-pay, comorbidity score, baseline systolic blood pressure, baseline diastolic blood pressure, change in systolic blood pressure, and change in diastolic pressure were significantly associated with first-fill rates ($P<0.05$). Race, number of hypertension medications ordered, number of office visits prior to prescription, post-systolic blood pressure, and post-diastolic blood pressure had no association. **Conclusions:** The data reveal characteristics of patients who are less likely to adhere to treatment for hypertension. Patients who are older, female, have comorbidities, and/or have relatively lower blood pressures may be less likely to adhere to treatment for hypertension. Patients with these characteristics may be potential candidates for interventions to improve adherence.

Abstract PS1-16

A Study Design to Evaluate Group Dialogue Activities to Improve Diabetes Outcomes

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Background: Behavior change and self-efficacy are key for patients with diabetes to sustain blood sugar goals, but many do not receive enough support for successful ongoing self-management. After initial education, Medicare reimbursement for diabetes education, commonly delivered on an

individual basis, requires physician referral and cannot exceed 2 hours of training per year for a beneficiary, plus 1 hour of nutritional services. We propose to study a novel and more cost-effective approach to improving self-efficacy and outcomes for patients with established type 2 diabetes who are not achieving optimal glycemic control. This randomized trial will formally evaluate the impact of a conversational group-based experience called IDEA (Interactive Dialogue Educational Activity). **Methods:** This multi-site, randomized, prospective trial will randomize 621 patients with A1c >7% to one of 3 study groups: (1) IDEA, 244 patients receive group sessions totaling 8 hours, with an average of 10 patients per group, using conversation maps as a conduit to facilitate dialogue between providers and patients; (2) Individual Education (IE), 244 patients receive 2 hours with a nurse educator and 1 hour with a dietitian; and (3) Usual care (UC), 133 patients receive no research intervention. The primary analyses will involve mixed model regression to assess whether IDEA improves outcomes compared to IE and UC. A1c, blood pressure, and lipids will be evaluated 6 and 12-months post-randomization, and behavioral, emotional, and satisfaction outcomes will be evaluated through survey at baseline, 3, 6, 9 and 12 months. Depending on 12-month results, a longitudinal four year post-intervention analysis is planned to assess sustainability of treatment effects and cost-effectiveness. **Results:** Results of this Merck funded trial, expected by June of 2010, could shed landmark evidence on whether education emphasizing interactive group activities can improve diabetes outcomes for patients who are not achieving optimal glycemic control. In addition, the study will assess whether this type of group experience is more effective than more traditional and costly individual education. **Conclusions:** Better ways are needed to improve diabetes patient self-management behaviors and outcomes. This rigorously designed study will contribute to knowledge necessary to determine the best content and style of delivery for diabetes education.

Abstract PS1-17

Husbands' Support and Women's Psychosocial Adjustment to an Ostomy Resulting from Colorectal Cancer

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Background/Aims: Some colorectal cancer (CRC) patients require a permanent ostomy (a surgically created opening on the exterior of the abdomen that allows feces to be eliminated from the body). An ostomy can create psychosocial distress for women and affect their body image, sense of self, and sexual functioning. Little is known, however, about how a husband's (or long-term male partner's) support influences their wife's psychosocial recovery. **Methods:** In this multi-site, NCI-funded study of long-term CRC survivors, participants completed the modified City of Hope-Quality of Life questionnaire, which yields scores of health-related quality of life (HR-QOL). We then conducted in-depth interviews with 30 female participants covering the topics of body image; sexuality in terms of personal history; meanings of sexuality practices and desires; and information needs regarding sexuality. Interviews were tape recorded, transcribed, and analyzed using standard qualitative methods. We compared women's global HR-QOL survey scores to interview discussions about husbands' support and psychosocial adjustment to an ostomy. **Results:** Of the 30 interviewees, 22 were married/partnered at the time of surgery or shortly thereafter. Of the 22 married/partnered women, 17 described positive support from their husbands as key to psychosocial adjustment, 3 described how a lack or withdrawal of support impeded recovery, and 2 described their husbands' support as neither positive nor negative. Among the 20 women who expressed either a positive or negative influence of their husbands' support, correlations with HR-QOL were noted. In 17 cases, women's high or low HR-QOL scores matched the positive or negative qualitative findings. The remaining 3 cases had positive qualitative data and low HR-QOL scores, but each of these women had serious current comorbidities. **Conclusions:** Husbands'/partners' support or lack thereof can have considerable short-term and long-term influences on the psychosocial recovery of female CRC patients with ostomies. Future research could validate these findings in a larger sample.

Abstract PS1-18

The Effect of No Tube on Gastric Emptying in Patients Undergoing Pancreatic Surgery

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Background: Delayed gastric emptying occurs in about 30% of patients undergoing pancreaticoduodenectomy. Tube feedings have been thought to exacerbate this problem. The main objective is to determine the effects of not performing enteral feedings via jejunostomy tube after pancreatic resection. **Methods:** We conducted an IRB approved, clinical trial in patients undergoing pancreaticoduodenectomy or total pancreatectomy. Patients were randomized to either a jejunostomy feeding tube placed at the time of surgery with tube feedings started 48 hours later followed by an oral diet on postoperative day 5 (Group A), or no feeding tube and started on an oral diet on postoperative day 5 (Group B). Drainage from the nasogastric tube, need for parenteral nutrition, and days until discharge were compared. We used t-test or non-parametric Wilcoxon test for comparing the main variables using one-sided test with a 0.05 level of significance. **Results:** Twenty-seven patients were included in the study: 15 in Group A, and 12 in Group B. The groups were similar in baseline characteristics except average age; 69 years in Group A vs 58 years in Group B (P=0.015). Comorbidities and indications for surgery were not significantly different between the two groups. In addition, 24 of 27 (89%) patients had cancer. The majority of patients had the nasogastric tube for 4 days with no significant difference seen in the output volumes between the two groups. Despite the enteral nutrition, 54% of the patients in Group A required parenteral nutrition compared to 25% in Group B (P=0.23). The average number of hospital days was 19.6 for Group A, and 9.1 for Group B (P=0.06). **Conclusions:** Patients tend to do better on no enteral feedings via jejunostomy tube after pancreatic resection. This finding has been translated into practice at our institution and patients resume oral intake postoperatively without jejunostomy tube feedings.

Abstract PS1-19

Improvements in Colorectal Cancer Screening Among Medicare Enrollees, 2000-2005

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Background: Medicare expanded coverage of colorectal cancer (CRC) screening in 2001 to include reimbursement for screening colonoscopy. The objective of this report was to examine trends and factors associated with CRC screening among non-institutionalized Medicare beneficiaries aged 65-80 years from 2000-2005. **Methods:** We used data from the Medicare Current Beneficiary Surveys for 2000, 2003 and 2005 linked to Medicare claims data. The primary outcome for this study was the proportion who were up-to-date for CRC screening, defined as undergoing home fecal occult blood testing (FOBT) within one year and/or colonoscopy within five years of the interview date. We used the Chi-square test for trend to assess changes over the six-year period under study and examined predictors of screening using multivariable logistic regression models. **Results:** The characteristics of the participants were similar for all three study-years. For 2000, median age was 73 years; 57% were female; 81% were whites, 9% were blacks, 7% were Hispanics, and 4% other ethnicities; 37% had income >$25,000; and 33% had 8th grade or less education, 35% up to high school graduation and 31% were educated beyond high school. During the study period, there was a statistically significant increase in the proportion of beneficiaries undergoing CRC screening from 44% to 51%. FOBT rates decreased from 18% to14% while colonoscopies increased from 36% to 57%. These changes were all statistically significant. For each of the three interview-years, enrollees were less likely to have been screened if they had not heard about CRC screening, did not know that Medicare provided reimbursement, a physician did not recommend testing, were lower income, less educated populations and experienced difficulty in receiving healthcare. **Conclusions:** CRC screening among Medicare beneficiaries increased significantly from 2000 to 2005, following the introduction of expanded coverage. This increase occurred in tandem with increasing use of colonoscopy among beneficiaries. However, efforts are still needed to increase the reach of CRC to disadvantaged populations.

Abstract PS1-20

Fiscal Tracking of Clinical Research: Marshfield Clinic Research Foundation Community Clinical Oncology Program

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Background: Marshfield Clinic Research Foundation (MCRF) is the research division of Marshfield Clinic. MCRF has received 25 years of Community Clinical Oncology Program (CCOP) funding from the National Cancer Institute (NCI). Grant funds require that each CCOP attain a specified number of credits through new participant enrollment and follow-up each year. The Principal Investigator (PI) and CCOP Administrator are responsible for tracking annual CCOP revenues and expenditures as well as CCOP credits. Revenue and expense details involved in the performance of CCOP clinical trials are difficult to track. Limited information is available regarding the true cost of CCOP clinical trials. **Methods:** Marshfield Clinic Research Foundation (MCRF) developed a tracking system utilizing electronic and manual processes, and established individual accounts for each research base within each source of revenue such as the NCI CCOP grant, pass-through additional federal and industry funds, additional private funds. Within each individual account established, expenditures were tracked electronically by various cost categories such as staff salaries and benefits (based on time and effort reports), laboratory sample preparation for send-outs, travel expenses to attend research-base meetings, copying, printing, telephone. **Results:** This poster provides general information and graphic depictions of how MCRF tracked CCOP revenues and expenditures from June 1, 2006 through May 31, 2007. Credit information per research-base and total by treatment, cancer control and follow-up credit is also provided. The data indicated that 52% of the expenses were funded by NCI grant funding, 12% from additional funds provided by the research bases, 29% from institutional support, and 7% from other funds donated for oncology research. **Conclusions:** To sustain a CCOP, significant financial support by the recipient institution is essential over and above the support of the infrastructure. During 2006-2007, MCRF recorded $4600 in expenses for each goal credit.

Abstract PS1-21

Radiotherapy Delay in Older Women With Early-Stage Breast Cancer

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Objective: To assess predictors of delayed radiotherapy (RT) and the potential impact of RT delay on breast cancer outcomes in older women with early-stage breast cancer. **Methods:** We studied 616 women, ages 65 years or older, who were diagnosed with early-stage breast cancer from 1990-1994 at six HMOs. These women were a subset of the Cancer Research Network's Breast Cancer Treatment Effectiveness in Older Women (BOW) cohort. All women included underwent breast conserving surgery and radiotherapy, but no chemotherapy. We examined whether race, age, estrogen receptor (ER) or progesterone receptor (PR) status, Charlson comorbidity index at diagnosis, tamoxifen use, tumor size, histology, and lymph-node positivity were associated with RT delays of more than 8 weeks post-surgery using chi-square tests and multivariate logistic regression. We applied Cox proportional hazards models to assess whether RT delay and demographic and clinical variables were associated with 10-year breast cancer recurrence rates. **Results:** Of the 82 women with delayed RT, 17 (21%) recurred, whereas only 73 of 534 (14%) without delay recurred (P=0.09). Of those with delays >8 weeks, mean delay was 114 days (16 weeks) and median was 69.5 days (10 weeks). African American race compared to White race was associated with delayed RT (OR, 3.1; 95% CI, 1.5-6.6) in multivariate analyses that controlled for demographic and clinical variables and HMO site. Breast cancer tumors larger than 2 cm were associated significantly with higher recurrence rates (HR=4.2; 95% CI, 2.2-8.1), as were subjects with more than 4 positive lymph nodes (HR=6.6; 95% CI, 1.9-22.7). There was a trend towards higher recurrence rates for subjects with RT delay (HR=1.7; 95% CI, 0.91-3.0). **Conclusions:** Although African American race was associated with RT delay, RT delay itself was not strongly associated with recurrence rates. Tumor characteristics are the major predictors of recurrence in this population of breast cancer patients.

Abstract PS1-22

Differences in Treatment of Ductal Carcinoma *In Situ* by Race/ Ethnicity in Large Integrated Health Plans

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Background and Aims: The diagnosis of ductal carcinoma in situ (DCIS) has increased markedly in the U.S. from 4,800 in 1983 to 59,000 in 2005. Although racial differences exist in the detection, diagnosis, evaluation, and treatment for invasive breast cancer, the extent of disparity for DCIS is unclear. Because women with DCIS are at high risk for local recurrence or invasive disease, it is critical to determine the degree of treatment disparities among racial/ethnic groups. We examined racial/ethnic variation in adjuvant therapy in a cohort of 3,000 women diagnosed with DCIS between 1990 and 2001 and treated with breast conserving surgery in three geographically diverse health plans based in California and Massachusetts. **Methods:** We reviewed medical records and abstracted information regarding DCIS treatment, demographic characteristics, and comorbidity. Stratified analyses and multinomial logistic regression were conducted. **Main Findings:** After adjusting for age, diagnosis year, study site, and geocoded income, odds ratios suggest that minority women were as likely to undergo adjuvant radiation therapy as white women. Asian/Pacific Islander women were somewhat more likely to receive adjuvant tamoxifen therapy (adjusted OR, 1.3; 95% CI, 0.7-2.2) compared to white women; however, there was little difference between white women and Hispanic women (adjusted OR, 0.8; 95% CI, 0.4-1.7) or black women (adjusted OR, 0.9; 95% CI, 0.5-1.7). Black women were somewhat less likely than white women to undergo a combination of adjuvant tamoxifen and radiation therapy (adjusted OR, 0.6; 95% CI, 0.4-1.0). Combination therapy was used to a similar extent in whites, Hispanics and Asian/Pacific Islanders. In a subset of patients for whom we had pathology data, tumor size and histology were controlled for in the analysis of adjuvant radiation therapy; however, these results were generally similar to those of the whole cohort. **Conclusion:** We found modest, though statistically insignificant, racial/ethnic differences in DCIS treatment. The similar use of adjuvant therapy by Asian, Hispanic, and white women is impressive and may be due to the general access to care in these managed care plans. The reasons for possible lower use of combined therapy among black women are unclear and require further study.

Abstract PS1-23

Control of Bowel Function by Colorectal Cancer Survivors With Permanent Intestinal Stomas: Behavioral Strategies

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Background: There are a growing number of colorectal cancer (CRC) survivors in the United States, many of whom live with a permanent intestinal stoma (ostomy). Bowel function control has tremendous implications to overall health-related quality of life (HR-QOL). **Methods:** Long-term (>5 years) CRC survivors with and without ostomies from three Kaiser-Permanente sites (Northwest, Northern California, Hawaii) were surveyed utilizing the City of Hope Quality of Life (mCOH-QOL)-Ostomy , followed by focus groups for patients with higher and lower HR-QOL. We compared HR-QOL for items specific for dietary changes and bowel function. Qualitative research techniques were used to analyze the open-ended questions, with the investigation team coding entries independently, reviewing discrepant codes, and reaching coding consensus. **Results:** Two hundred eighty-six ostomate and 395 non-ostomate CRC

survivors completed the survey. While more controls felt comfortable with their diet less than one month after operation (48.6% vs 41.3%), a greater proportion took over one year or never felt comfortable with their diet (21.9% vs 18.0%). Ostomates had less problems with constipation (P=0.001), and more with gas (P=0.02) than controls. More cases avoided vegetables (P=0.007), while a greater proportion of controls avoided carbonated beverages (P<0.001) and utilized specialty diets (P=0.03). There were multiple dietary and behavioral changes utilized to control bowel habits, including the timing of eating, exercise, and food avoidance. **Conclusions:** CRC survivors utilize multiple techniques to control their bowel function, and thus control their lives. Insight into these methods can lead to meaningful interventions for this population of cancer survivors.

Abstract PS1-24

Fatigue and Sleep Quality of Persons with Ostomies: Gender Differences

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Background: Some colorectal cancer (CRC) patients require a permanent ostomy (a surgically created opening on the exterior of the abdomen that allows feces to be eliminated from the body). An ostomy can create psychosocial distress and affect body image, sense of self, and sexual functioning. Few studies have examined health-related quality of life (HR-QOL) relevant to disturbed sleep of CRC survivors with ostomies; moreover, no studies have examined gender differences of ostomates on quality of sleep and fatigue. **Methods:** HR-QOL was examined in this cross-sectional study of long-term (>5 years) CRC survivors with ostomies, who receive care at Kaiser Permanente health systems in California, Oregon, Washington, and Hawaii. Participants completed the City of Hope Quality of Life Ostomy questionnaire, which includes demographic and scaled items, and narrative comments for greatest challenges associated with having an ostomy. Two items, 'fatigue' and 'sleep disruption' (scale from 0 to 10), served as dependent variables. Age, ethnicity, education, partnered status, body mass index (BMI), and time since surgery were included in models. Data were analyzed using t-tests and ordinal logistic regression modeling with significance set at P<0.05. **Results:** Women (n=118) compared to men (n=168) were less likely to be partnered (25% vs 55%, P<0.0001). There were no differences for age, ethnicity, education, BMI, or time since surgery. Regression modeling for fatigue showed women to have lower HR-QOL compared to men (0.65 decrease, P<0.01), adjusted for time since surgery (modest positive association, P<0.05). Regression modeling for sleep disruption also showed women to have poorer HR-QOL (0.57 decrease, P<0.01), adjusted for age (modest positive association, P<0.001). CRC surgical controls without ostomy showed no significant gender difference for either HR-QOL item. Qualitative narrative comments suggest sleep disruption is associated with fear of, or actual, leakage during hours of sleep. **Conclusions:** Women CRC survivors with ostomies report more fatigue and sleep disruption that may contribute to poorer HR-QOL compared to their male counterparts. Higher rates of fatigue for women are consistent with gender differences in other health conditions. These findings can provide a foundation for gender-specific ostomy interventions to improve sleep quality.

Abstract PS1-25

Statin Use is Associated With a Reduced Risk of Colon Cancer Recurrence

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Background: A significant body of data suggests that statin use reduces the risk of developing colon and other cancers, although other data have not confirmed these findings. **Aims:** To examine whether statin use helps prevent recurrence of colon cancer in patients with resected disease. **Methods:** We conducted a retrospective analysis of patients treated for stage I-III colon cancer in a large metropolitan health system. Incident cases of colon cancer between 1995, and the present were identified through the tumor registry of the health plan-owned hospital. All identified cases were then crosschecked against the HMO membership database. Data regarding statin use was pulled from the HMO outpatient pharmacy database. For each patient all available data from the 5-year window prior to first diagnosis of cancer until either recurrence or most recent data available was obtained. Demographic data and survival data from the tumor registry were then combined with pharmacy data regarding statin use in a single database for analysis. Recurrence and time to recurrent disease were compared in statin users and non-users. **Results:** A total of 358 colon cancer cases were available for analysis. Median follow-up of patients after diagnosis of colon cancer was 49 months. Eighty-nine patients (24.9%) used statin drugs for some period of time with a median of 780 days of use. Median age of all patients enrolled was 69 years (range, 24-95 yrs). Statin use was higher in patients ages 61-75 years (33%) than in those aged 24-60 years (22%) or those aged 76-95 years (19%) P=0.02). There was no association between statin use and stage at diagnosis. Only 6 of 89 patients (6.7%) with any statin use relapsed as opposed to 43 of 269 (16%) of patients with no statin use (Fisher's exact, P=0.03). Kaplan-Meier analysis of relapse curves found a significant difference in relapse between groups with a 2-year recurrence rate of 3.7% among statin users and 10.1% among non-users (Log Rank, P=0.03, using age stratification). **Conclusions:** Statin use was associated with a decreased risk of recurrence in patients diagnosed with stages I-III colon cancer in this study. Further study of statin use in the prevention of colon cancer is warranted.

Abstract PS1-26

The Content of Physician-Patient Discussions During Routine Health Maintenance Exams

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Background: Little is known about the content of routine health maintenance exams (HMEs) delivered by primary care physicians (PCP) in today's busy primary care practices. We describe the frequency of patient-physician cancer screening discussions amidst the competing demands of other preventive services during routine HMEs to understand HME content in the real world of primary care. **Methods:** We use direct observation of PCP-patient interactions during HMEs to examine discussions around breast, colorectal (CRC), cervical, lung and prostate cancer screening and other lifestyle topics. Visits represent the first 103 visits completed in an NIH-funded study using in-office observations, audio-recordings and patient surveys to study CRC screening recommendations. Physician participants (n=34) are general internists or family physicians practicing in a large integrated delivery system in southeast Michigan with patient-specific electronic medical record prompts for evidence-based cancer screening. Patient participants were aged 50-80 years who scheduled an HME with a participating physician and were due for CRC screening (i.e., no colonoscopy or barium enema within 10 years, flexible sigmoidoscopy within 5 years, or fecal occult blood testing (FOBT) within 12 months). **Results:** CRC screening was mentioned in 96% of observed HMEs. Among visits by women (n=74), 85% mentioned breast and 51% cervical cancer screening. Among visits by men (n=29), 72% mentioned prostate cancer screening. Lung cancer screening was mentioned in 15% of visits. The physician initiated these discussions more than 80% of the time, with the exception of lung cancer screening (53%). Colonoscopy was overwhelmingly the procedure recommended for CRC screening (82%), followed by FOBT (37%) and others (4%). Other topics frequently discussed were exercise (88%), cholesterol (81%), smoking (68%), weight (68%), blood pressure (65%), and diet (65%). While these discussions were usually initiated by physicians, patients were relatively more likely to initiate discussions around weight (41%) and diet (35%). **Conclusions:** In this study

of patients due for CRC screening, discussions did occur and specific recommendations frequently were made for CRC screening. Other cancer screening and preventive issues were discussed, but less frequently. PCPs are uniquely positioned to impact the delivery of these preventive measures and seem to be successfully striving to meet guidelines, particularly those for CRC screening.

Abstract PS1-27

Enrollment Rates of Hispanics Identified Via Surname for a Web-Based Nutritional Intervention

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Objective: To describe the enrollment rates and individual characteristics of Hispanics and non-Hispanics invited to participate in a multi-site Web-based intervention promoting increased fruit and vegetable consumption (MENU). **Methods:** A total of 5751 randomly selected members were invited to enroll in a Web-based nutritional study. Probable Hispanic status was determined by the Latino surname algorithm based on the Passel-Word Spanish Surname List utilized by the 1990 US Census. We computed enrollment rates stratified by ethnicity status and used logistic regression to examine characteristics associated with the likelihood of enrollment. To address potential bias associated with the use of Hispanic surname, sensitivity analyses were conducted comparing self-reported ethnicity of enrolled members to the Passel-Word-identified ethnicity. **Results:** There were 2871 probable Hispanics and 2880 probable non-Hispanics invited to join the study. A total of 174 (6.1%) probable Hispanics and 340 non-Hispanics (11.8%) enrolled in the study for a total enrollment of 514 (8.9%) invitees. Overall, Hispanics were 47% less likely to enroll, females were four times as likely to enroll, and those people with a median income census tract less than $41,994 were 44% less likely to enroll. Stratifying by probable ethnicity status suggests Hispanics females were 87% more likely to enroll and Hispanics with a median income census tract less than $41,994 were 46% less likely to enroll while the odds for non-Hispanics enrolling increased 14% for each decade increase of age and non-Hispanics with a census tract median income less than $41,994 were 43% less likely to enroll in MENU. Self-reported Hispanic rates showed a sensitivity of 91.1% and specificity of 88.8%. Total enrollment of Hispanics into MENU totaled 192 (7.6%), of which 146 (76.0%) were enrolled by Kaiser Permanente Colorado. **Conclusions:** This study demonstrates that identifying Hispanics through surname for oversampling can be highly successful in terms of sampling yield and accuracy. However, results from this study suggest that Hispanics are significantly less likely to enroll in a Web-based nutritional intervention. Additional research is needed to identify methods of attracting more Hispanic subjects to these kinds of interventions.

Abstract PS1-28

The Relationship of Social Support and Smoking Cessation Among African Americans Enrolled in the Project Quit Study

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Background/Aims: African-Americans are disproportionately affected by the health consequences of smoking. Cigarette smoking is one of the main contributors to lung cancer, which is the second most common cancer among this group. Social support is a key component of effective non-pharmacological cessation programs. The objective of this analysis was to examine the association of social support and smoking cessation at 6 months among African-Americans enrolled in a randomized trial. **Methods:** In 2006, 204 African-American members from two large managed care organizations enrolled in Phase I of a Web-based smoking cessation intervention, Project Quit. In addition to the Web-based intervention, participants received a free course of nicotine replacement therapy (patch). All participants received layers of tailored messages to encourage cessation. Each participant was asked at baseline if they had someone who would be supportive while he/she quit smoking. The number of supporters was categorized in three groups: (1) 0-1 supporters; (2) 2-4 supporters; and (3) 5 or more supportive persons. The primary outcome of the study was 7-day abstinence at 6-month follow-up, regardless of use of other cessation products and services. Logistic regression modeling was used to test the association between smoking cessation with the number of social supports and tailoring intensity. **Results:** Among the 202 African-Americans, 65 (32.2%), 98 (48.5%) and 39 (19.3%) reported 0-1, 2-4, and 5 or more supportive persons for smoking cessation, respectively. For the 46 people who quit, we observed a trend toward significance for social support and quitting (P=0.07). The odds ratio for quitting for group 2 versus 1 was 0.86 (95% CI, 0.38-1.94; P=0.71), and for group 3 versus 1 was 2.35 (95% CI, 0.91-6.05; P=0.08). Adding tailoring intensity did not contribute to cessation (P=0.70). **Conclusions:** A larger support network specific to smoking cessation is advantageous beyond personally relevant computer tailoring for this African-American population. Our findings suggest that people with higher social support are more likely to quit regardless of the tailoring intensity. Further research should explore the synergistic relationship of computer-based interventions and personal support networks in smoking cessation among African-Americans.

Abstract PS1-29

Social Characteristics and Health Care Utilization Associated With Exemption From Immunization

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Background: This study evaluated usefulness of automated databases in identifying vaccine exemptions. It also studied social characteristics and health care utilization patterns of children who were exempted from immunization. **Methods:** We conducted an observational cohort study of children aged 0 through 6 years enrolled in two large health plans. We used both the immunization registry and medical record to identify the child's vaccine exemptions and assess the child's status regarding recommended vaccinations. We categorized children into racial, education, and income groups based on the distribution of these characteristics in his/her community from 2001 census data. We used administrative data to identify the child's utilization on well-child, outpatient, prescriptions, ER and hospital visits. The knowledge of these characteristics will provide critical information on designing interventions to improve immunization compliance and long-term follow-up with these children. **Results:** We compared exemption information found in the medical record with that found in the administrative data of our chart review sample. Although negative predictive value of the electronic data compared to the chart reviews was 92% and 90% for 2-year and 6-year olds, respectively, positive predictive value was only 52% and 62%, respectively. Additionally, our results indicate that exemptors are more likely to come from well-educated, higher income areas than non-exemptors. Exemptors were found not to have opted out of the health care system and continue, although less frequently for the age 2 group, to use services in the health plans. **Conclusions:** Without better-automated data and the need for chart reviews, tracking of children with immunization exemption status would be expensive. Since parents of exemptors are well-educated, interventions should focus on communicating to parents of exemptors the most updated information on vaccines and vaccine preventable diseases.

Abstract PS1-30

Parent Perceptions of Neighborhood Safety and Children's Physical Activity: Implications for Health Messages and Advice

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Background: Physical activity (PA) in early adolescence has been demonstrated to be associated with not only the risk of pediatric overweight and obesity but also with the trajectory of lifestyle habits and the risk of

overweight and obesity in early adulthood. The specific aim of this study was to assess how parents' perception of neighborhood safety is associated with PA in children aged 10-12 years. **Methods:** Based on a cross-sectional design, 201 parent-child dyads were enrolled from a random sample of Kaiser Permanente members in two distinct geographic areas in Oakland, California, designed to represent relatively high and low SES based on zip code and census tract information. Parents and children were interviewed by telephone and asked their perception of the neighborhood environment (a modification of the Neighborhood Environment Walkability Survey (NEWS)) including factors related to traffic and crime safety, social capital, and aesthetics, and about frequencies of specific crimes. For each domain, a summary score was created, which was the mean of the score of all items in the domain. Parents reported the number of days/week their child participated in vigorous and moderate PA. Ordered logistic regression was used to model the association between the NEWS/crime frequency variables and parents' report of children's vigorous and moderate physical activity. Analyses were stratified by high-income versus low-income zip codes and adjusted for child's gender, parental SES variables and race/ethnicity. For each model, we obtained the odds ratio, 95% confidence interval, *P*-value, and q-value to adjust for repeated testing in each domain. **Results:** In the adjusted model, items from the NEWS that were significantly associated with parents' report of children's vigorous PA included safety of parks at night and the presence of crosswalks and pedestrian signals. The crime frequency summary score and frequency of some specific crimes (i.e., murder, being beaten up, teens carrying guns) were also associated with children's vigorous PA. **Conclusions:** The results of this study indicate the importance of considering parents' concern for children's safety in the design of programs, interventions, health messages and counseling that aim to promote children's physical activity.

Abstract PS1-31

The Association Between Body Mass Index and High Sensitivity C-Reactive Protein by Gender

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Background/Aims: Prior studies relating inflammatory biomarkers to obesity demonstrated a correlation between elevated body mass index (BMI) and elevated C-reactive protein (CRP). To date, however, little research has examined the association of the newer, high-sensitivity CRP assay (hs-CRP) to BMI of both men and women. **Methods:** In this cross-sectional study, the association between BMI and hs-CRP by gender was estimated in 376 subjects recruited from a network of community-based, primary care clinics in eastern Pennsylvania. The data were analyzed with Spearman's correlation and multivariate linear regression, accounting for age, gender, high density lipoprotein, and hypertension. The natural logarithmic transformation was used due to the presence of right-skewness of the distribution of hs-CRP. **Results:** All subjects were Caucasian, 52% were male with a mean age of 62, BMI of 30.6. The sample consisted of 21% with diabetes mellitus and 72% with hypertension. There was a significant positive association between BMI and hs-CRP (r=0.28) for the entire sample. This association was slightly weaker in males (r=0.24) compared to females (r=0.31), and did not significantly vary (*P*=0.9425). The adjusted associations demonstrated limited confounding (males: r=0.23; females: r=0.28), suggesting that BMI may be an independent factor for elevated hs-CRP. **Conclusions:** BMI and hs-CRP correlate positively, slightly more for women than men. In patients with elevated BMI, elevated hs-CRP has potential for use as a cardiac risk stratification tool. Elevated levels of hs-CRP in the obese individual could direct initiation of statin use to reduce the chronic inflammatory state or assist in cardiac risk stratification. In a time of limited patient resources and tighter budgets, these data give promise for the judicious use of biomarkers based on BMI for cardiac risk stratification.

Abstract PS1-32

Attorney General Consumer and Prescriber Grant Program. Changing Prescriber Behavior: The Meyers Primary Care Experience

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Background: The Meyers Primary Care Institute (MPCI) is one of 28 Attorney General Consumer and Prescriber Grant Program grantees. Four HMORN CERTs sites, including MPCI, received grants. The Institute is developing curricular interventions to educate prescribers regarding the influence of pharmaceutical marketing on prescribing behavior. Our objectives are to encourage prescribers to incorporate understanding of this influence into their practice and utilize best evidence to improve patient care. **Methods:** In 2006-2007 the MPCI convened a multidisciplinary group of advisors with skills in research, patient care and education. We convened focus groups of prescribers (NP, PA, PharmD and MD) to learn about their experiences with pharmaceutical representatives. Integrating this evidence with detailed data from the peer reviewed literature and recommendations regarding best-practices in electronic learning, we are developing 6 educational modules: (1) Pharmaceutical Development and Regulation; (2) Evidence-Based Medicine; (3) Pharmaceutical Marketing; (4) Organizational Influence; (5) Communication with Pharmaceutical Representatives; and (6) Communication with Patients. These modules will be freely accessible to all prescribers via web-based delivery systems, will include downloadable PowerPoint presentations and content notes for faculty who wish to integrate them into their own curricula, and PDA downloads for clinicians. **Results:** We will showcase elements from the modules, discuss issues of development and implementation, and suggest ways in which HMORN partners may be able to utilize these and other grantee resources to improve the practice of their clinical partners.

Abstract PS1-36

Secular Trends in Diagnosis and Antibiotic Treatment of Childhood Infections

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Background: Antibiotic prescribing rates for young children have declined dramatically in recent years. We aimed to determine what drove this decline in 8 communities throughout Massachusetts. **Methods:** We obtained automated claims data from four large health insurers on antibiotic dispensings and visit diagnoses in children 3 to <24 months of age and 24 to <48 months of age from Sept 1998-August 2003, and created diagnosis categories for common infections. We determined diagnosis rates (# visits for each diagnosis/total # of person-years [p-y]), antibiotic treatment rates (# visits for each diagnosis associated with an antibiotic/ total # of p-y) and the percent

treated (# visits for each diagnosis associated with an antibiotic/total # of visits for each diagnosis). We additionally assessed antibiotic dispensings not associated with a specific visit. **Results:** We analyzed a total of 78,253 p-y. Among those aged 3 to <24 months, overall treatment rates decreased from 2.8 to 2.2 antibiotics/p-y (22%). Acute otitis media (AOM) was the most common diagnosis (2.1/p-y) and the most frequent reason for antibiotics (1.4/p-y) in 1998-1999. These decreased by 19% and 20%, respectively, by 2002-2003 (P<0.0001), accounting for 45% of the overall decrease. Antibiotics that were not linked to a visit accounted for another 28%. Among those aged 24 to <48 months, overall treatment rates decreased from 1.7 to 1.5 antibiotics/p-y (11%). AOM was again the most common diagnosis (1.0/p-y) and the most frequent reason for antibiotics (0.7/p-y) in 1998-1999. These decreased by 12% and 11%, respectively, by 2002-2003 (P<0.0001). AOM treatment accounted for 43% of the overall decrease in antibiotics and unlinked antibiotics accounted for another 52%. The percent of AOM associated with antibiotics remained stable in both age groups. **Conclusions:** In spite of new recommendations for 'watchful waiting' for some cases, the percent of AOM treated, once diagnosed, remained stable. The substantial overall decline in antibiotic prescribing was driven by declines in rates of diagnosis of AOM and antibiotics not linked to a visit. Unlinked antibiotics included refills and prescriptions after telephone encounters. Decreases in antibiotic use appear to be the result of changes in diagnostic thresholds rather than treatment of diagnosed conditions.

Abstract PS1-37

Dentist Attributes Associated With Sealant Placement

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Background: Dental sealants have been shown to be effective in reducing caries by 80%, however, not all children are at risk of developing caries and therefore it is more efficient to seal the teeth in those children at high caries risk. This was an examination of the relationship between patient and dentist characteristics and the application of sealants. **Methods:** This study utilized claims and administrative data from a large dental managed care organization in Minnesota. Sealant placement was a covered benefit in the study period. This study was conducted using the data from 6173 children 6 years of age between 1995 and 2006 who had dental encounters with either a general or pediatric dentist and no prior record of receiving a sealant. They all had an assessment of their level of caries risk (low, moderate or high) at age 6. Sealant placement within 6 months of the caries risk exam visit served as the dependent measurement. **Results:** There were 73 general dentists represented in the study but only 3 pediatric dentists. However, the pediatric dentists had about 20% of the encounters. About 22% of patients were seen by a female dentist and the medium age of the dentist seen was 45. Sixty-two percent of children were deemed at low caries risk and 15% and 23% were at moderate and high risk. Logistic regression analysis predicting 6-month sealant application found higher sealant application rates among children at high or moderate risk (OR 1.89, P<0.0001; OR 1.54, P<0.0001) and female children (OR 1.39, P<0.0001). General dentists were more likely to apply sealants than pediatric dentists (OR 1.94, P<0.0001) even though pediatric dentists were almost twice as likely to rate patients at high risk (38% vs. 20%, $P\leq$0.0001). Younger dentists (under age 55) were more likely to apply sealants (OR 1.21, P=0.0483). **Conclusions:** It is encouraging to see that children at moderate and high risk of developing caries are more likely to be sealed than children at low risk. This is not consistent with earlier studies but may be related to the complete coverage of sealants in the study population. The observation that pediatric dentists see more high risk patients but are less likely to seal may relate to different practice patterns or could be an artifact of the small numbers of pediatric dentists in the study. The reduced sealant rate for older dentists may be related to earlier dental school training not encouraging sealant use.

Abstract PS1-38

Is the Placement of Dental Sealants Related to Caries Risk?

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Background: The purpose of this investigation was to examine the relationship between a caries risk assessment (CRA) score and the subsequent application of sealants. **Methods:** Data were collected from the data sets of a large dental managed care organization in Minnesota. Sealant placement was a covered benefit in the study period. This study was conducted using the data from 8458 children 6 years of age between 1995 and 2006. Six percent of the subjects (472) had a prior history of a sealant at the time of their first CRA and were therefore excluded. This left 7986 subjects. CRAs were classified into 3 scores; low, moderate and high and all analyses were made relative to the first caries risk assessment at age 6. **Results:** The distribution of initial CRAs found 61.4% with low risk, 15.3% with moderate, and 23.3% at high risk. In the high risk category 36.9% of children had dental coverage through public programs verses 18.8% for the low risk group (P<0.001). Of the children at low risk 19% received a sealant within 6 months of their CRA while among the children with moderate or high risk, 26% and 27% had subsequent sealant within 6 months (P<0.0001). When the 6-month follow-up timeframe to include any later sealant was lifted, sealant rates were 69%, 69% and 67% (P=0.19). **Conclusions:** First, higher risk children are composed of significantly more children from lower socioeconomic status. Second, it appears that when a child of 6 years of age is assessed to be at high risk for the development of subsequent caries, they are more likely to receive a sealant within the period following the caries risk assessment. However, as the interval after the caries risk assessment lengthens, other factors impact the likelihood of a sealant application in the low-risk group and their rate approaches that of the high-risk children.

Abstract PS1-39

Maximizing Opportunities to Implement and Evaluate Translating Research Findings into Clinical Practice (TRIP)

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Background: The HMORN is an excellent laboratory for translational research, being comprised of a diverse group of health care delivery systems with associated research staff. **Methods:** We interviewed each HMO on formal organizational characteristics of the research organization (RO) and the delivery system (DS), as well as the structural relationship between the RO and the 'parent' system. The interviews focused on TRIP: (1) modifiers, (2) facilitators, and (3) barriers. HMO confidentiality was maintained for all interview data. **Results:** Of the 15 HMORN members, 13 HMOs participated, 9 with individuals from both RO and DS, 2 with individuals from RO only, and 2 with individuals from DS only. Our results contain information from interviews, emailed questionnaires sent to all HMOs, and HMO websites. Results are organized by TRIP areas of focus: **TRIP:** We assigned a TRIP score for each HMO as follows (% of HMO): 1=no system for TRIP or dependent on individual clinicians (7.7%); 2=TRIP driven by departments or care teams, with some information technology support (38.5%); 3=systematic TRIP plus electronic medical record (EMR) functions and decision support (46.2%); and 4=RO integrated into level 3 above (7.7%). **Modifiers:** We created a variable called 'chaos' for both RO and DS where 1=no chaos and 5=total chaos. Most felt a minor degree of chaos was beneficial as it initiated improvement measures. Of the 13 HMOs, 7 were 'academically' oriented with research tending to focus on mainstream science (e.g., NIH R01 grant support). A 3rd modifier was EMR with variation in data use by various organizations and the degree to which ROs had direct access. **Facilitators:** We identified 4 types of facilitators: quality and types of communication between RO and 'parent', extent to which interventional research is conducted in the DS, amount of consulting done by researchers in the DS, and the value placed on publishing results. **Barriers:** This consisted primarily of issues related to communication, implementing change, and organizational

culture. **Conclusions:** Based on the results, our recommendations for increasing TRIP are: (1) ensure integrated development of a master data warehouse; (2) improve communication with special emphasis on involving researchers more directly with DS teams; (3) promote further research to identify what works/does not work in implementing TRIP; and (4) 'think globally, but translate locally.' Funded by NIH/AHRQ for the HMORN CCSN (Coordinated Clinical Studies Network).

Abstract PS1-41

A Diabetes Quality Improvement Project at a Rural Primary Care Clinic

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Background: In reviewing first quarter clinical quality metrics in 2006, the primary care department at the Merrill Center identified a statistically significant drop in glycemic control for their diabetic population that did not occur across the clinic system-wide. Quality improvement changes were implemented from mid 2006 through mid 2007. **Aim:** To increase glycemic control more than 50% over 12 months as evidenced by the percentage of patients with diabetes having most recent A1c test results <7%. **Methods:** The system-wide quality improvement initiative increased provider awareness and educated providers on the need to improve clinical outcomes for patients with diabetes. Providers partnering with nurse educators resulted in increased referrals to the Diabetes Self Management program. Diabetes educators intensified insulin dosing for patients with uncontrolled blood sugars through use of a standard protocol. In addition to expanding existing diabetes services and hours, telephonic care management was initiated for high risk patients. **Implementation:** An electronic medical record (EMR) and tablet computers improved the information that providers and other members of the care team could use to access at the point of service. An electronic reminder system helps identify patients not at goal requiring further testing, education, or medical intervention. A process for gathering outside A1c test results improved the coordination of diabetes care across health care facilities. **Results:** Glycemic control as evidenced by the percentage of patients with most recent A1c test results <7% rose from 41% in second quarter of 2006 to 68.2% in third quarter of 2007 for the more than 800 patients with diabetes. **Conclusions:** To improve quality of care, provider awareness and support are essential in developing a comprehensive diabetes program. Increased provider awareness, supported by an EMR has built a team approach to education, medical management, and care coordination resulting in improved glycemic control.

Abstract PS1-42

Demonstrating the Effective Practice

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Background: For 160 years, government agencies, corporations, and nonprofit organizations have relied on demonstrations of radical innovations and interventions to stimulate interest in them and subsequent diffusion. Unfortunately, researchers and practitioners alike often fail to distinguish the functions that a demonstration project may serve and, thus, put into practice hybrid demonstration forms that typically under-achieve in all functional objectives. **Methods:** We (1) visited internal demonstrations of effective practices in primary care, palliative care, and population preventive services, (2) discussed the planning of demonstrations with national strategic support staff, and (3) reviewed the published literature about demonstration projects. **Results:** In Kaiser Permanente nationally, demonstration projects are often initiated without regard to functional specification, perceptions of potential adopters, communication training of demonstration staff, or knowledge of published literature about the operation of demonstration projects. **Conclusions:** The potential for improving the internal demonstration of effective practices in integrated healthcare delivery systems is large. Cost-effective strategies exist to improve the decision making of potential adopters, as well as accelerate the dissemination of effective practices through formative evaluation about the credibility of potential adopters, potential adopters' perceptions of practices to be demonstrated, staff training, and implementation support.

Abstract PS1-44

Using Fault Tree Analysis and Probabilistic Risk Assessment to Improve Medication Safety in Ambulatory Care

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Background: In a previous study of adverse drug events (ADEs) in the ambulatory setting, we found that 42% of the serious, life-threatening, and fatal ADEs were preventable. We identified 7 types of errors in medication prescribing and monitoring that were the proximal causes of these events: 1) prescribing a medication for which the patient has a history of allergy, 2) a medication that conflicts with recent laboratory values or the patient's medical conditions, 3) a medication that interacts with other medications the patient is taking or 4) an excessive dose, 5) inadequate monitoring or 6) not acting on the results of monitoring, or 7) the patient does not use prophylaxis for known side effects of the medication. The aim of this study is to assess the feasibility of applying fault tree analysis and probabilistic risk assessment to the analysis of errors contributing to ADEs. **Methods:** We applied probabilistic risk assessment techniques borrowed from the safety engineering industry to identify system-level interventions for reducing the rate of ADEs. Interdisciplinary clinical including primary care and specialist physicians, advanced practice nurses, nurse managers, and pharmacists were convened to construct fault trees (graphic representations of events contributing to an undesired outcome) for the 7 types of errors in prescribing and monitoring medications. We are using probabilistic risk assessment software (SAPHIRE) to evaluate the fault trees, develop cut-sets, and identify and analyze potential system-level interventions to prevent ADEs. **Results:** Participants learned to develop complex and thorough fault trees with little difficulty. The clinicians quickly became comfortable detailing the systemic and individual processes that lay behind serious medication errors. The fault trees reveal an array of opportunities to implement interventions with a high probability of improving patient safety. **Conclusions:** Techniques for risk reduction from industry appear to be of value in assessing and improving safety problems related to medication prescribing and monitoring.

Abstract PS1-45

The Johns Hopkins Hospital at Home Care for Acutely Ill Older Persons: A Model for Managed Care

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Background: Acute hospital care of older patients is often associated with adverse events including functional decline, iatrogenic illness, dissatisfaction with care among patients and family members, family stress related to caring for a family member, and high costs. Delivering acute medical care at home in a hospital at home (HaH) that substitutes for traditional acute hospital care may be associated with better outcomes in these domains. **Aim:** Describe results of a national demonstration study of a HaH model of care in Medicare managed care and Veterans Administration (VA) settings. **Methods:** Prospective, nonrandomized clinical trial, in which acutely ill older persons (age >65) who met required hospital level care for community-acquired pneumonia, congestive heart failure, chronic obstructive pulmonary disease, and cellulitis were followed through their usual hospital course during an observation phase (n=286) and were offered HaH care during an intervention phase (n=141). The study populations were from three Medicare managed

care plans and one VA medical center. **Results:** Subjects in the study groups had similar baseline demographic and health characteristics. Sixty percent of patients offered HaH care opted for it (n=84). Patients in HaH received types of treatments associated with hospital care. Length of stay was shorter for patients in HaH, 3.2 vs. 4.9 d, (P=0.001). Patients cared for in HaH had reduced risk of clinical complications including incident delirium, adjusted odds ratio 0.26 (0.12, 0.57) and use of sedative medications, adjusted odds ratio 0.49 (0.30, 0.81). HaH care was associated with trends towards better physical functional outcomes. Illness-specific quality of care standards were met in similar proportions in HaH and hospital-treated groups. Patient and caregiver satisfaction with HaH was better than that associated with hospital care across multiple domains (P<0.001). Family members of HaH patients experienced significantly less stress related to the caring for an acutely ill family member during the HaH episode compared with patients treated in the hospital (P<0.001). Costs of HaH care were lower for HaH patients. **Conclusions:** HaH is an efficacious model of acute care delivery for selected older persons with certain medical illnesses. Dissemination of the HaH model into managed care settings is warranted.

Abstract PS1-48
A Team Approach to Improving Post Hip Fracture Care

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Background: Patients over the age of 50 sustaining hip fractures by falling only from a standing height are at high risk for osteoporosis and recurrent fracture. Unfortunately, this group frequently leaves the hospital without any therapy to prevent future fractures. A previous survey of 183 hip fracture patients reviewed discharges for the years 1998-2000 at Scott & White Memorial Hospital and revealed an area of concern. Of this group only 48 subjects (26%) had a prior diagnosis of osteoporosis, but only 34 (19%) received bisphosphonates and 29 (16%) received hormone replacement therapy sometime during the 1 year follow-up period. This abstract describes the results of an initiative to increase the therapeutic interventions for osteoporosis in the post hip fracture patients at the Scott & White facility of the Texas A&M Health Science Center. **Methods:** A clinical database was established at Scott and White to track this population. The endocrinology and orthopedic areas agreed to add calcium supplements (1500 mg daily) containing vitamin D (400 IU daily), a DEXA scan request and a consult with endocrinology to the hospital discharge orders in appropriate patients. Three hundred fifty-five patients were enrolled in the database between September 2004 and June 2006. One hundred sixty-six patients who were followed for at least 6 months and who qualified for osteoporosis medication were used for the analysis. **Results:** Thirty-six (26.3%) patients used calcium supplements with vitamin D before their fracture compared to 91 (66.43%) of patients at follow-up (P <0.001). Seventeen subjects (12.41%) were taking bisphosphonates before their fracture and the number increased to 66 (48.18%) after the treatment intervention. Eighty-two patients (49.6%, P <0.001) kept the appointment for the DEXA scan and 54 (32.5 %) saw the endocrinologist. **Conclusions:** The addition of calcium supplement with vitamin D to the hospital discharge medications was an effective and cost efficient method of improving treatment and enhancing compliance over the study period. Providing the opportunity for a routine endocrinology outpatient consultation after hip fracture increased the treatment of osteoporosis with effective bone active medication; however, many of the patients did not attend the consult.

Abstract PS1-49
Development, Implementation and Evaluation of a Web-based Curriculum on Pharmaceutical Marketing and Prescribing

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Background/Aims: To use grant funding resulting from lawsuit settlement funds from off-label marketing of Neurontin® to develop, implement, and evaluate a web-based curriculum on drug marketing and prescribing, and to revise the material using evaluation data from a live pilot session. The final revised curriculum will be made available to prescribers in the public domain. **Methods:** Content and education experts developed an educational course entitled 'Optimal Prescribing,' which consisted of five modules of slides, video clips, narration, cases, interviews, and interactive slides. The course was presented to physicians, physician assistants, and nurse practitioners from the Lovelace Health System in Albuquerque, New Mexico, in a live 5-hour workshop. Data were collected using an audience response system, a pretest and posttest, a written evaluation form, and staff observations. These data were analyzed and summarized to revise the material to produce web-based modules for use by prescribers in the public domain. In addition to the live pilot evaluation, these prescribers and a control group of providers who did not attend the pilot course will be surveyed to assess the impact of the education on attitudes about relationships with industry representatives, the amount and source of information that guide prescribing decisions, and self-reported changes in prescribing patterns. **Results:** Twenty-five prescribers participated in the live pilot session on June 23, 2007. From the analysis of the data, it is clear that the materials must be reduced in length and tied to very clear learning objectives in order for future users of the material to be motivated to complete the course. The longer the module in the pilot session, the less engaged the learners were. The learners expressed a need for more information on interpreting research studies and performing calculations such as the number needed to treat/harm. The learners valued a checklist of information needed to make informed prescribing decisions and lists of balanced sources of information. The 6 month post-pilot survey is being prepared and results will be available by March 2008. **Conclusions:** To make this curriculum more useful to prescribers, it must be simplified in format and content, while preserving and enhancing the key insights of the curriculum. Subsequent evaluation will include the self-reported effect on prescribing and attitudes toward industry influence on prescribing decisions.

Abstract PS1-50
Format Change of Computerized Test Order Form Affects Physician Behavior

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Background: Inappropriate use of laboratory diagnostic tests lowers quality and raises costs of care. Our study was designed to find whether a reduction in testing could be obtained by the simple strategy of changing the set-up of the check-box laboratory order form that is embedded in a computerized medical record. **Methods:** A prospective intervention study was carried out at Maccabi Healthcare Services (MHS), an Israeli HMO that has used a computerized medical record since 1992. The MHS central data repository retains complete historical records of patient demographic data, physician data, laboratory results, using the patient's unique national identification number. In May 2005 we changed the order form and reduced the number of tests that can be ordered from 51 to 26 using a check-box form. Twenty-seven tests were removed from the form and two tests were added. Changes in physician' test ordering were then studied. **Results:** While tests that were added or retained on the computerized laboratory order form showed an increase of 17% and 64% in number of tests ordered per visit compared to the period prior to intervention, tests that were removed showed a reduction of 7% in test ordering and a further reduction of 28% in the subsequent year. **Conclusions:** Changes in format of laboratory test order forms may be a powerful tool to improve appropriateness of testing. A thoughtfully built test ordering form can save unnecessary tests and can reinforce clinical guidelines for the performance of some preventive testing and follow-up. Electronic health records can be utilized for implementing policy.

Abstract PS1-51

The Risk of Serious Hypersensitivity Reactions Among Patients With Food Allergies

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Background/Aims: Using Kaiser Permanente Northwest's electronic medical record and linked databases, we sought to estimate the incidence of serious hypersensitivity reactions among a community-based cohort of patients with clinically confirmed food allergies. **Methods:** We conducted a retrospective, dynamic cohort study, which enrolled patients as early as January 2000 and as late as December 2004. We followed patients 6 to 75 years old until they experienced their first serious hypersensitivity reaction requiring medical assistance: urgent care visit, emergency department visit, or hospitalization. Patients' food allergies-peanut, tree nut, fish, shellfish, egg, and milk-were confirmed through radioallergosorbent test (RAST) food panel findings or skin prick test findings and an allergy diagnosis documented in the notes of their electronic medical record. **Results:** We identified 97 patients with a clinically confirmed food allergy who experienced 5 hypersensitivity reactions. The 1-year cumulative incidence was 4.3% (95% CI, 1.6% to 11.0%). All the reactions were emergency department visits. **Conclusions:** The electronic medical record can be used to identify efficiently those patients with clinically confirmed food allergies. Our incidence estimate is imprecise, in part, because so few patients had undergone recent RAST or skin prick testing and very few of them met allergists' strict criteria for a clinically confirmed allergy.

Abstract PS1-52

Reasons for Diabetes Clinical Inertia in Primary Care Practice

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Background: Previous studies suggest clinical inertia, defined as lack of treatment intensification in a patient not at goal, is largely responsible for the slow improvement seen in population measures of diabetes care. It is controversial how much of the inertia problem is attributable to providers, care systems, or patient preference. **Methods:** An electronic visit-based decision support tool called Diabetes Wizard was successfully implemented in 6 HealthPartners Clinics from 10/06 through 5/07 as part of the NIDDK funded study entitled 'Reducing Clinical Inertia in Diabetes Care' (DK068314). The Wizard gave relevant clinical information and specific recommendations for treatment intensification for glycemia, blood pressure, and lipids. In addition, 19 consented physicians in the clinics agreed to complete an electronic visit action resolution (VAR) form at each encounter if the patient was not at goal for glycemia, blood pressure, or lipids and treatment was not intensified. The VAR was completed by checking from a list of possible reasons or through free text. **Results:** Out of 1639 encounters with patients not achieving A1C <7%, the WIZARD was used and VAR completed 831 times (51%). Inertia occurred in 258 (43%) of the VAR completed visits. Reasons that were specified by physicians for glycemia inertia were: (1) choice of patient not to increase or add medications, 70 (19.6%), (2) need for an updated A1c, 62 (17.3%), (3) followed by endocrinology or diabetes nurse, 53 (14.8%), (4) addressed dietary/lifestyle changes instead, 45 (12.6%), (5) other problem/acute illness addressed, 17 (4.7%), (6) not my patient, 13 (3.6%), (7) addressed adherence problem, 13 (3.6%). Other reasons that were sited less frequently (<2.5%) were medication regimen already too complex, hypoglycemia concerns, drug intolerance, cost concerns, advanced age or severe comorbidities, referred to endocrinology or diabetes educator, close to goal, and other miscellaneous reasons. **Conclusions:** Only a relatively small amount, <20%, of total glycemia inertia at diabetes patient encounters is attributable to patient refusal or preference. The remaining reasons could potentially be addressed through care system changes, including point of care testing to assure up-to-date A1C test results are available at visits, provider training, and better coordination of care with the extended care team and primary provider colleagues.

Abstract PS1-54

The Effect of Simvastatin on Surrogate Markers of Vascular Health in Youth

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Background: Failure to diagnose preclinical cardiovascular disease in youth misses a major opportunity to prevent the long-term consequences of this disease. We have conducted a pilot study to evaluate surrogate vascular markers (SVMs) that are associated with early arterial injury including flow-mediated vasodilatation, carotid intima media thickness (IMT), arterial stiffness, and biomarkers including cell adhesion molecules (ICAM-1, VCAM-1), methylarginines (asymmetric dimethylarginine [ADMA], symmetric dimethylarginine [SDMA]), and C-reactive protein (C-RP). We hypothesized that one or more of these SVMs which are linked to early pathological vascular changes will identify high-risk youth with early vascular injury compared to a healthy group and that these markers will tend to normalize with risk factor reduction. We further hypothesized that one or more of the markers will correlate with the Pathological Determinants of Atherosclerosis in Youth (PDAY) risk score. **Methods:** Ten subjects without any known risk factors and 22 hypercholesterolemic (HC) youth, aged 10-20 years were recruited from the pediatric clinic. The majority of the HC group was also obese. The HC group was randomized to diet + 20 mg of simvastatin vs. placebo for 24 weeks followed by a forced titration to 40 mg vs. placebo for 24 weeks ending with a final evaluation after a 12 week washout period of diet alone. **Results:** The markers that best distinguished the HC from the control subjects were C-RP (P=0.03), VCAM-1 (P=0.05) and SDMA (P=0.04). With the exception of ICAM-1 and C-RP, the marker values improved in the treatment group more than the placebo group and the relative changes were the largest for the methylarginines, a marker closely tied to insulin resistance. The markers that demonstrated the highest correlation with the number of risk factors were VCAM-1 (r=0.45, P=0.055) and SDMA (r=0.48, P=0.04). PDAY risk scores were calculated for each subject and SDMA (r=0.50, P=0.03) and Arg/SDMA (r=-0.50, P=0.04) again emerged as the most highly correlated SVMs. Consistent with the relatively low PDAY risk scores and a minimally thickened IMT, the data suggest that the majority of subjects do not have advanced atherosclerotic changes. We conclude that SVMs are a useful index of vascular injury in high-risk youth.

Abstract PS2-01

The Effectiveness of a Screening Program for the Identification of Asymptomatic Women at Risk for Cardiovascular Disease

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Background: Women with peripheral vascular disease (PVD) remain under-diagnosed and under-treated due to lack of screening coupled with a lack of disease awareness. As the presence of PVD may be indicative of asymptomatic or subclinical cardiovascular (CV) disease, it is important to possess knowledge of risk factors and symptoms that may be associated with PVD so that appropriate medical care for systemic atherosclerosis is instituted. We screened ambulatory women for PVD and measured their knowledge and awareness of PVD and associated risk factors. **Methods:** In a cross-sectional study, we screened 162 ambulatory women (40-85 years) for the prevalence of PVD and associated atherosclerotic risk factors, and administered a survey to assess the participants' knowledge and awareness of PVD, its consequences, and their personally perceived risk of developing PVD. The electronic medical record was reviewed for documented evidence of CV risk factors, comorbidities, and corresponding treatment. Of the total cohort, 108 (66.7%) were categorized as having an increased risk of CV disease based on a modification of the Framingham CV risk score taking into account the presence of carotid intimal medial thickness (cIMT) >1.0 mm or ankle-brachial index (ABI) = 0.9 as surrogate markers for CV disease. **Results:** In the subgroup of 108 at-risk women, the number of risk factors present ranged from 2 to 7. Approximately 26% had 2 documented CV risk factors (classified moderate-risk), and 74% had >2 documented CV risk

factors (classified high-risk). Knowledge and awareness scores (% correct) for PVD were low regardless of CV risk factor group (<50%). To assess perceived risk, when asked whether they thought they had risk factors for PVD, 53.6% of moderate-risk women and 58.8% of high-risk women responded either 'no' or 'not sure'. **Discussion:** These data demonstrate that women are at an increased risk for both cardiac and non-cardiac vascular diseases, but lack knowledge and awareness of their risk and its implications for both heart and PVDs. We advocate screening programs to detect subclinical vascular and CV disease through the use of surrogate markers such as ABI and cIMT in asymptomatic women, as well as aggressive risk factor management to decrease future adverse event rates. Future longitudinal studies to evaluate the effectiveness of screening tools in the lowering of risk scores are underway.

Abstract PS2-03

Health Communication and Health Literacy for Persons at Risk for CVD – Experiences Using Two Health Care Organizations

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Background/Aims: Technological advances in health communications can potentially help or create barriers for individuals to manage chronic disease care. However, we know little about preferences for receiving cardiovascular disease (CVD) prevention information among individuals with multiple risk factors for CVD and varying health literacy levels. The overall design of the study is a mixed-methods design assessing health literacy levels and preferences for receiving CVD prevention information using surveys and in-depth interviews with patients who have two or more risk factors for CVD. However, this presentation will focus on the recruitment process for the study. **Methods:** Participants were recruited from two health care organizations (an HMO organization and a community health clinic) in Denver, CO in order to obtain a more diverse study sample as well as capture a wider range of health literacy levels and experiences with receiving health information. Using two health care systems required receiving human subjects' approval from two institutional review boards (IRB). The original recruitment methods, which consisted of identifying potentially eligible individuals through each organization's electronic medical records system, sending out an introductory recruitment letter with an opt-out postcard followed up with a recruitment call, were approved by one IRB and not the other. **Results:** After reassessing the allowable recruitment methods from the community health clinic's IRB, it was decided that the overall recruitment methods for the project would be selected to suit each organization's patient populations. In the HMO setting, the originally proposed methods were used. In the community health care setting, two different methods were used. First, 5 physicians identified patients that were potentially eligible for the study and an 'opt-in' introductory letter was mailed out from each of the physicians. Second, in-clinic recruitment was conducted to reach the final recruitment goal. Experiences with using two different recruitment methods for participants and outcomes associated with using these methods will be reported. **Conclusions:** The results of these recruitment efforts are important for researchers in that one must consider and plan for potential changes required from IRBs and the implications of such changes on projects when partnering and conducting research with multiple institutions.

Abstract PS2-04

The Potential Impact of Heart Disease Prevention and Treatment Interventions

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Background: Rational policy making could benefit from an estimate of the deaths that might be prevented or postponed (DPP) by developing more effective behavior change programs and fully implementing technologies that are currently available to prevent and treat heart disease. **Methods:** To estimate the impact of developing more effective behavior change programs and fully implementing currently available technologies to prevent and treat heart disease, we created a hypothetical population ages 30-85 years resembling that of the United States. We divided the population into three prevalence pools (no apparent heart disease, known heart disease without left ventricular systolic dysfunction [LVSD] and known heart disease with LVSD). We divided clinical events into one of three types: out-of-hospital cardiac arrest, acute or emergent heart disease events, and non-emergent heart disease events. We defined the difference in total DPP between current implementation levels and full implementation levels as the outcome of interest. **Results:** In this hypothetical population, 87,500 would have no apparent heart disease; 9900 would have heart disease without LVSD; and, 2600 would have heart disease with LVSD. Expected death rates for the three subpopulations would be 0.007, 0.035, and 0.067, respectively. During 1 year without treatment 1133 individuals would be expected to die: 613 without apparent heart disease, 346 with heart disease but no LVSD, and 174 individuals with heart disease and LVSD. The DPP that would result from implementing lifestyle changes and prescribing medications in the prevalence pools would be 648 and the DPP from implantable defibrillators might be another 60. The DPP from fully implementing treatments during the three types of acute cardiac events would be 70. **Conclusions:** If effective behavior change programs were developed and currently available heart disease prevention and treatment technologies were fully implemented, approximately 62% of all deaths among adults in the United States might be prevented or postponed. Fully implementing currently available interventions during acute cardiac events would prevent or postpone about 7% of all deaths.

Abstract PS2-05

Anemia in Heart Failure: Patterns & Relationships With Health Outcomes

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Background/Aims: The prevalence of anemia in chronic heart failure (HF) is at least one in five patients. Several studies suggest that anemia is independently associated with mortality and hospitalization among patients with HF. Existing studies are often limited by several factors (e.g., inadequate clinical data, non-standardized definitions of anemia), but the most important limitation has been the use of only one laboratory measurement to identify anemia. These studies are thus unable to characterize patterns of anemia over time and their relationship with health outcomes. Within Kaiser Permanente Colorado (KPCO), we identified a 6-year cohort of HF patients. Our aims included 1) describing the incidence and prevalence of anemia, 2) characterizing trajectories of anemia over time, and 3) assessing patterns of anemia over time relative to outcomes of hospitalization and mortality. **Methods:** To be included in the study cohort, a patient had to be older than 18 years of age with a primary hospital discharge diagnosis of HF (defined as the index event), a KPCO member for at least 6 months prior to the hospitalization, and have at least one hemoglobin (HGB) value during the index event. Patients were classified as anemic at time of index event and at time points during their follow-up period (minimum of 6 months; maximum of 6 years) based on HGB values. Cox proportional hazards analysis was used to assess the independent association between the pattern of anemia and subsequent hospitalization or death. Covariates included baseline HBG value, time dependent comorbidities, serum sodium concentrations, creatinine clearance values, age, and sex. **Results:** During the 6 year study period, 2478 patients met cohort inclusion criteria. All patients had a baseline HGB value and 90% had at least one follow-up HGB value. Forty-five percent of patients were determined to be anemic at the index event. Final results will be completed in early January 2008. **Conclusions:** Preliminary analysis shows that patients with anemia with HF may have poorer outcomes than HF patients who are not anemic. The treatment of HF patients with anemia will be discussed.

Abstract PS2-06

Comorbidities Associated With Onset of Atrial Flutter and Atrial Fibrillation in General Population

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Background: Atrial flutter (AFL) and atrial fibrillation (AF) are the most common atrial tachyarrhythmias. The conditions leading to the onset of one of these arrhythmias over the other remain largely unknown. **Methods:** To determine and compare the prevalence of known risk factors for cardiovascular disease among unselected individuals presenting with their first ever episode of AFL or AF, we evaluated 11 pre-selected clinical variables including age, sex, stroke, myocardial infarction, congestive heart failure (CHF), hypertension, rheumatic heart disease, smoking, chronic obstructive pulmonary disease (COPD), diabetes and thyroid abnormality. Using the resources of the Marshfield Epidemiologic Study Area, a database that captures nearly all medical care among its nearly 60,000 residents, all newly diagnosed cases of either AFL or AF in the region during a 4-year period were identified. Fischer's exact test was performed to compare the difference between AFL patients and AF patients for each of the 11 above-mentioned clinical characteristics. Multivariate logistic regression analysis was performed to obtain odds ratio (OR) and corresponding 95% confidence interval (CI) for the status of AFL for each preexisting comorbidity, with adjustment for age and gender. **Results:** Among the 472 incident cases, 76 (16.1%) had AFL and 396 (83.9%) had AF. Compared to those with AF, subjects with AFL were more likely to have had a history of COPD (25% vs. 12%, *P*=0.006) and CHF (28% vs. 17%, *P*=0.05). Hypertension on the other hand, was more common among individuals with AF (63% vs. 47%, *P*=0.01). After adjusting for age and gender, patients with AFL as opposed to those with AF had higher odds for having a history of COPD (OR 2.34, 95% CI 1.26-4.32, *P*=0.007), CHF (OR 2.00, 95% CI 1.12-3.58, *P*=0.019), and lower odds of hypertension (OR 0.56, 95% CI 0.34-0.93, *P*=0.025). These statistically significant associations persisted even with COPD, CHF, and hypertension simultaneously included in a multivariate logistic regression model, in addition to age and gender. **Conclusions:** This study represents the first report to evaluate potential differences in the conditions associated with the development of AFL versus AF in man. This study raises an important question regarding the role of COPD and hypertension playing a role in initiation and maintenance of AFL and AF, respectively by their selective influence on the right atrial and left atrial dynamics, respectively.

Abstract PS2-08

Hormone Therapy and Blood Pressure in an Elderly Cohort of Women

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Background: Data on the effect of hormone therapy (HT) on blood pressure are limited and contradictory. Some clinical trials and epidemiologic studies have reported no net effect on blood pressure or decreases in blood pressure, while others have found that HT use increases systolic blood pressure. The objective of this study was to examine the association between HT use and blood pressure among an elderly cohort of women. **Methods:** Medical records were retrospectively reviewed from 1989 to 1999 among a subsample of women participating in a longitudinal study conducted at Kaiser Permanente Southern California. For each year, up to three blood pressure measures were abstracted randomly from among all blood pressure measurements recorded in the medical record. A total of 1021 postmenopausal women who had at least one blood pressure measurement at both baseline and follow-up were included in this analysis. Changes in blood pressure over time between HT users and nonusers were examined. **Results:** HT users (n=487) and nonusers (n=534) were similar in age at baseline with an overall mean age of 70.3 ± 3.9 years. The average duration of HT use was 27.6 ± 12.0 years. The mean duration of follow-up was 8.8 ± 0.5 years in HT users and 8.7 ± 0.6 years in nonusers. Systolic and diastolic blood pressures were significantly higher at baseline among HT nonusers compared with users (138.8 ± 15.5 mmHg vs. 135.9 ± 16.1 mmHg, *P*<0.01; and 79.5 ± 7.8 mmHg vs. 77.7 ± 7.9 mmHg, *P*<0.001, respectively). Systolic blood pressure increased over time among both HT nonusers and users, while diastolic blood pressure decreased over time. The average change in systolic blood pressure over time was significantly higher in HT users than nonusers (7.0 ± 0.9 mmHg vs. 4.3 ± 0.9 mmHg, respectively; *P*=0.03) and was independent of education, physical activity, cigarette smoking, alcohol consumption, and body mass index. The change in diastolic blood pressure was not statistically significant. **Conclusion:** These data suggest that elderly women who use HT have a larger increase in systolic blood pressure over time than nonusers; however, HT use does not affect diastolic blood pressure over time.

Abstract PS2-09

Racial Disparities in Actions to Control Blood Pressure in a Managed Care Organization

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Background: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) recommends lifestyle modifications (such as reducing sodium intake) to help control blood pressure (BP) in adults with hypertension. We analyzed variation by race in self-reported actions to control BP, both lifestyle activities and receipt of physician advice, within a random sample of adults with hypertension in a group-model managed care organization. **Methods:** We randomly sampled 3000 18- to 74-year-olds with hypertension (750 from each of the 4 JNC VII hypertension stages) who had BP measured on at least 2 recent primary care visits. The survey, administered by telephone in 2007, included the Behavioral Risk Factor Surveillance System (BRFSS) Actions to Control Blood Pressure items and questions on race/ethnicity and socioeconomic status. Data on enrollee demographics, body mass index, antihypertensive medication use, and preexisting diabetes, hyperlipidemia, coronary artery disease and congestive heart failure were obtained from computerized administrative data. Lifestyle activities and receipt of physician advice were analyzed between black and white patients using descriptive and multivariate logistic regression analyses, adjusting for age and gender, BP control, obesity and pre-existing chronic conditions. **Results:** Seven hundred thirty-nine adults responded (25% overall response rate, 58% cooperation rate – similar to the 2006 national BRFSS rates). Blacks (54% of respondents) were older, had worse BP control, and had higher prevalence of obesity and diabetes than whites (all *P*=<0.05). Blacks were more likely than whites to report changing dietary habits to control BP (88% vs. 82%, *P*=0.02) and to report receipt of advice on dietary habits, salt reduction, alcohol consumption, and exercise (all *P*=<0.01). The higher likelihood of blacks reporting receipt of advice remained significant (OR=1.6 on alcohol consumption to OR=2.5 on salt reduction, all *P*=<0.01) in multivariate models. **Conclusions:** In this sample of adults with hypertension, blacks were more likely than whites to report receipt of advice from physicians on actions to control BP. Although blacks had worse BP control and a higher prevalence of obesity, which had independent associations with receipt of advice, these factors did not account for the racial disparities. Further research is needed to clarify whether the racial differences in self-reported receipt of advice represent a recall or response bias, or other unmeasured patient or delivery system factors that affect likelihood of a patient receiving advice on actions to control BP.

Abstract PS2-11

Lessons Learned in Using Electronic Health Records in Management of Cardiovascular Disease

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Background: The risk of cardiovascular events is reduced through the optimal management of serum lipids, blood pressure, smoking, weight, physical activity and other established risk factors. To bridge the gap between knowledge and practice, we tested an electronic health record (EHR)-based prototype care model to routinely screen for and manage cardiovascular disease (CVD) risk. **Methods:** We developed and tested automated protocols to accomplish six tasks: (1) identifying patients who should be evaluated for risk of CVD using a modified Framingham Risk Score at the point of care; (2) ordering appropriate tests leveraging routine physician visits; (3) determining 5-year risk of heart attack; (4) communicating risks to patients via automated letters from physicians; (5) engaging those at moderate to high risk of heart attack to modify behavior; and (6) providing physicians with clinical decision support (CDS). **Results:** The prototype care model was evaluated on 346 patients. Steps 1 through 4 were successfully implemented. Step 5, engaging patients in behavior change, was too limited and did not provide the patient with sufficient control over various options. Step 6, providing CDS, presented physicians with 1 of 43 fixed order sets. A more dynamic and flexible order process was needed to satisfy physician needs. **Conclusions:** This prototype care model presents a successful first step toward automating screening and basic care of chronic diseases while focusing care on a patient-centered model. The problems revealed through this system were largely process challenges.

Abstract PS2-12

Developing a Scalable Chronic Care Model for Primary Care Management of Cardiovascular Disease Risk

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The existing models for chronic disease management (DM), including the chronic care model (CCM) and DM offer a well-accepted conceptual framework for continuous care of patients with chronic diseases. However, there are logistical and process challenges to developing scalable primary care models consistent with these concepts. We are developing a second generation prototype care process for primary-care-based management of cardiovascular disease (CVD) that is consistent with these models. We will describe the research and development and prototyping process for creating new health services models. We will specifically describe workflow and technology solutions for the following steps in the care process: (1) identify patients who should be evaluated for CVD risk (i.e., males 45+, females 55+) using an automated and systematic process; (2) collect CVD risk data in an automatic and systematic fashion during routine primary care visits, including collection of behavioral health data via a web-based questionnaire; (3) calculate a modified Framingham Risk Score based on self-reported data (i.e. smoking, alcohol) and clinical and lab values from the medical record; (4) communicate to patients their 10-year risk of heart attack; (5) engage moderate to high-risk patients to return for a primary care visit during which they initially decide on interventions (i.e., medications, coaching, education, etc.) for each risk factor; and (6) develop sophisticated clinical decision support that completes a real-time evaluation of patient data and manufactures a draft order set, clinical notes, and after visit summary in advance of the patient and physician encounter. Finally, we will describe outcomes relevant to evaluating the prototype and plans for system-level scaling.

Abstract PS2-13

Are Diabetes Patients With Depression More Likely to Get Routine Care Process Measures?

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Background: This study was designed to test the hypothesis that diabetes patients with a depression diagnosis are less likely than those without a depression diagnosis to receive recommended frequencies of glycated hemoglobin (A1c) and lipid testing. **Methods:** We identified 14,144 adults with diabetes receiving care from a single large multispecialty medical group in Minnesota between 1997 and 2003. Those with two or more depression ICD-9 codes, or with one depression ICD-9 code plus at least one prescription fill for depression medication were classified as having depression. A total of 2179 met these criteria. Subjects were tracked for 4 years. Data on A1c and lipid tests were extracted from claims data and verified by chart audit in a sub-sample of patients. **Results:** The 2179 individuals with at least one depression episode had a mean age of 60 and had 8.2 primary care visits, on average. Eight hundred thirty-five (38%) of these individuals were male, 1886 (86%) took an antidepressant, 570 (26%) had at least one other comorbid condition, 642 (29%) disenrolled in the plan prior to 20 months, and 259 (12%) were newly diagnosed cases of diabetes. Relative to those without a depression diagnosis, those with a depression diagnosis had significantly fewer (P<0.001) than recommended A1c and low density lipoprotein (LDL) tests in bivariate analysis (30% compared with 35% among non-depressed cases). This finding persisted after adjustment in multivariate models for age, sex, comorbidity, number of primary care visits, and duration of the diabetes episode. **Conclusions:** Episodic depression is associated with sub-optimal monitoring of A1c and LDL levels in diabetes patients. These findings may help direct efforts to improve diabetes care in those with depression. They also suggest accountability measures used to assess quality of diabetes care may need to be adjusted for differences in depression occurrence across providers, clinics, or medical groups.

Abstract PS2-15

Diabetes as Risk Factor for Herpes Zoster Infection: Results of a Population-Based Study in Israel

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Background: Studies showed that diabetes mellitus (DM) is often accompanied by impaired cell-mediated immunity, which potentially may increase the risk for infectious diseases, including herpes zoster (HZ). However, data on the relation between DM and HZ are scarce. This case-control study explored the association between DM and HZ. **Methods:** This study was nested within a cohort of all members of a large health maintenance organization (HMO) in Israel. Cases totaled 22,294 members who were diagnosed with HZ between 2002 and 2006. Controls (n=88,895) were randomly selected from the remaining HMO population using frequency-matched age, sex, and duration of follow-up. Personal data on history of DM, lymphoma, leukemia, or AIDS, were obtained from computerized medical records. **Results:** Adjusted analyses showed that the risk of HZ was associated with history of leukemia, lymphoma, use of steroids or antineoplastic medications and AIDS, particularly among patients under 45 years. In a multivariate analysis, DM was associated with an increased risk of HZ (OR=1.53; 95% CI: 1.44-1.62). **Conclusions:** The data suggest that individuals with DM are at increased risk of HZ. Well-designed cohort studies may help to clarify the nature of this association.

Abstract PS2-16

How Do the Best Physicians Get Diabetes Patients to Glycemic Goals

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Background: There is considerable variation in the ability of physicians to bring diabetic patients under glycemic control. The purpose of this study was to examine medication prescribing patterns relative to glucose control of the clinically most successful doctors in the management of diabetes patients. **Methods:** The data investigated came from data collected from the electronic medical record (EMR) of HealthPartners Medical Group (HPMG) between 3/1/2005 and 2/28/2006. The study looked at 80 primary care physicians treating diabetes patients in 20 clinics around the twin cities area. Physicians were ranked on the number of diabetes patients at the combined goals of having an A1c <7%, a low density lipoprotein (LDL) <100 mg/dl, blood pressure <130 mm, a nonsmoker and taking a daily aspirin. The top 25% (n=20) of these physicians were classified as 'optimal physicians' and compared with the remaining 75% of physicians (n=60). Medication adjustments were examined at each primary care encounter relative to the last known A1c level. **Results:** There was no difference in the optimal physician distribution between the physicians having a specialty of family medicine (47%) relative to those with a specialty of internal medicine (P=0.1299). The numbers of diabetic patients treated (mean 100) was also not a factor associated with optimal physician status (P=0.9361). Optimal physicians managed more patients to their glucose goals (23.1% vs. 18.9%; P=0.0290). When we looked at the average A1c level where physicians continued to titrate the dose of oral glucose control medications for patients above goal, there was a significantly (P=0.0120) lower mean threshold for titration for the optimal verses the other physicians (7.8% vs. 8.4%). **Conclusions:** While all physicians are focused on managing diabetes patients who are above their glucose goal, the optimal physicians are willing to continue making medication adjustments to a point closer to the glucose goal than other physicians. This does not appear to be related to experience gained through having more diabetes patients in their patient panel, but may indicate that optimal physicians are more comfortable or perhaps knowledgeable about continually titrating medications when patients are near the glucose goal. Perhaps if other physicians could be given further training and support tools such as what may be embedded within an EMR, they could also achieve similar results.

Abstract PS2-17

Identifying Characteristics Associated With Abnormal Blood Glucose Readings Among African Americans

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Background: The Centers for Disease Control recently recommended that community-based screening for diabetes be discontinued due to their low yield of incident cases and challenges in the follow-up for abnormal cases. Moreover, community-based screenings for diabetes are not considered efficacious even in high-risk populations. The purpose of this study is to evaluate the characteristics associated with random abnormal blood glucose readings among African Americans in order to determine the potential value of a more targeted approach to community-based screenings. **Methods:** Data were collected from participants of an ongoing community-based screening study at screening events hosted by a large urban health care system. Data collected included gender, race, age, self-reported height and weight, health history, blood pressure (BP), and random blood glucose. Individual parameters were analyzed in a univariate logistic regression model; parameters with P<0.20 were then considered in a multivariable logistic regression model. The final model was selected using the backward selection method and retained parameters with P<0.05. **Results:** Between October 1999 and September 2002, there were a total of 5485 participants. Of these, 89% were African American, 61% were female, and the mean age was 49.8 (SD=15.88). Eighty-eight percent (4832) had never been previously diagnosed with diabetes and among these, 274 (5.7%) had an abnormal blood glucose reading. Results indicated that age, BP, and body mass index (BMI) were significantly associated with abnormal glucose readings (all P-values <0.001). Among participants who had never been diagnosed with diabetes, those who were 50 years or older were 1.7 times more likely to have an abnormal glucose reading compared to participants <50 years (OR: 1.74; 95% CI: 1.33, 2.27). Participants with abnormal BP screenings were 1.4 times more likely to have an abnormal glucose reading (OR: 1.44; 95% CI: 1.09, 1.90). In addition, increasing BMI was associated with abnormal glucose readings. More specifically, for every 1-unit increase in BMI, the odds of having an abnormal glucose reading increased 4.7% (OR: 1.047; 95% CI: 1.028, 1.066). **Conclusions:** Age, abnormal BP, and BMI are all associated with random abnormal blood glucose readings among those with no previous diagnosis with diabetes. These findings suggest that more research is needed in order to determine the value of a more targeted approach to community-based screenings for diabetes.

Abstract PS2-18

Patient-Provider Communication About Prescription Drug Costs Among Medicare Part D Beneficiaries

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Background: Many Medicare beneficiaries face substantial out-of-pocket prescription drug costs under Part D. Providers may be able to help patients make clinically appropriate choices when they have concerns about drug costs. We examined patient-provider cost discussions during the first year of Part D benefits. **Methods:** We conducted telephone surveys in early 2007 in a stratified random sample of Part D beneficiaries of a large integrated delivery system (n=1040, response rate=74.9%). Patients reported whether they talked with a doctor, engaged in any cost coping behavior (e.g., switched to a cheaper medication, split pills with their doctor's advice), reduced adherence (e.g., stopped refilling a prescription) or experienced financial burden (e.g., went without another necessity) because of their drug costs in 2006. We used multivariate logistic regression to examine characteristics associated with talking with a doctor about costs and the association between discussions and cost responses. All analyses were weighted for differences in sampling proportions. **Results:** Overall, 15.6% reported discussing drug costs with a doctor: 11.7% of patients who did not reach the coverage gap ('doughnut hole'), and 32.6% of those who did. Among patients who talked with their doctor, 80.0% initiated the discussion and 62.6% felt their provider was helpful. In conjunction with these discussions, patients most frequently reported that their doctor switched a prescription to a less expensive version (46.1%), talked to them about which medications should definitely not be skipped (32.0%), and asked whether they could afford the medication before prescribing (26.5%). After adjustment for individuals' drug costs and other characteristics, patients who talked with their doctor about drug costs were more likely to report each of the three types of cost responses compared with those who did not: cost coping behavior (OR=5.42, 3.05-9.61), reduced adherence (OR=2.96, 1.62-5.43), and financial burden (OR=3.01, 1.27-7.13). **Conclusions:** In this study population, fewer than 1-in-6 patients discussed drug costs with their doctor, but the majority of those who did found their doctor helpful. Patients most frequently reported that their doctor switched them to a cheaper medication or advised them on the clinical necessity of their medications. There appears to be a strong association between patients talking with their doctor about costs and reporting behavioral responses to drug costs.

Abstract PS2-19

Enrollees in Deductible-Based Health Insurance Plans: Who Takes the Road Less Traveled?

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Background: Many employers are offering their employees choices of health insurance plans that differ in their upfront costs, e.g., lower monthly employee premiums, and in the amount of patient cost-sharing, e.g., deductibles for the first dollar of care. In a group of employees who had a choice of traditional plan (no deductible) or deductible plan in 2006, we examined characteristics associated with choosing the deductible plan. **Methods:** All subjects were primary subscribers in a large integrated health delivery system with a choice of traditional and deductible health plans. We used logistic regression to examine the characteristics associated with the choice of deductible plan and explored interactions between characteristics. Subscriber characteristics include enrolling any children (age <18 years) or elderly (65 years or older) on their plan, enrolling any chronic disease patients with asthma, diabetes, coronary artery disease, hypertension, or heart failure on their plan, neighborhood (census block group) education and income. There were 5 levels for neighborhood education: =20%, =15%, =10%, =5% or <5% of adults had less than a high school education, and 6 levels for neighborhood income: median household income <150%, <200%, <300%, <400%, <500% or =500% of the federal poverty level. **Results:** Among the 29,701 primary plan subscribers, 21% chose a deductible plan, 30% of the subscribers had children or elderly on their plan, and 38% had a chronic disease patient on their plan. Characteristics associated with choosing a deductible plan included not enrolling children or elderly on their plan (OR=1.32, 95% CI: 1.23-1.41), having no chronic patient on their plan (OR=1.61, 95% CI: 1.33-1.96), living in neighborhoods with higher education (OR=1.16 for each level increase in education, 95% CI: 1.13-1.18), living in neighborhoods with higher median income (OR=1.19 for each level increase in income among subscribers having no chronic patient on the plan, 95% CI: 1.15-1.23; OR=1.13 for each level increase in income among subscribers having chronic patients on the plan, 95% CI: 1.08-1.19). **Conclusions:** One in five employees with the choice of a deductible health insurance plan chose the deductible-based plan. Employees without children or elderly on their plan, who lived in neighborhoods with higher educational attainment and higher median household incomes, and who had no one with a chronic condition on their plan were more likely to choose a deductible plan.

Abstract PS2-20

Associations Between Self-Reported and Database Out-of-Pocket Drug Costs and Changes in Prescription Drug Behavior

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Aims: We examined 2006 total self-reported and database-calculated out-of-pocket (OOP) costs and prescription drug behavior under Medicare Part D to assess the association between cost measures and behavior change. **Methods:** We collected information on 2006 total self-reported OOP costs and cost responses through a stratified random sample survey of Part D members of a large integrated delivery system (IDS) (n=1040, response rate=74.9%). Behavior changes included reduced adherence (e.g. skipping pills), cost-coping (e.g. switching to cheaper drugs), and financial burden (e.g. borrowing money). We also calculated total 2006 OOP costs using the IDS' pharmacy database. We used logistic regression to examine the association of self-reported and database OOP costs with behavior change, adjusting for gender, education, marital status, race/ethnicity, self-reported health, income, assistance with medications, and number of prescriptions in 2006. All analyses were weighted for sampling proportions. **Results:** Sixty-seven percent of patients reported costs = $500, 16% reported $500-$1000, 10% reported $1000-$2000, and 8% reported = $2000. Fifty-one percent of respondents reported OOP costs that agreed with their database OOP cost category, 18% reported lower costs, 32% reported higher costs. Patients taking 5 different medications and those with higher database OOP costs were less likely to report OOP costs in the same category as the database calculation. Overall, 36% of respondents reported 1 behavior change due to drug costs. Patients with self-reported OOP costs >$500 had higher odds of reporting behavior change compared to those with costs <$500 (OR=3.4 [1.8-6.2] for $500-$1000, OR=3.6 [1.8-7.5] for $1000-$2000, OR=3.3 [1.7-6.5] for >$2000) after adjustment for database costs and covariates. Database OOP costs were not significantly associated with behavior change after adjustment for self-reported costs. Patients with income below 200% of federal poverty level and those with 5 prescriptions had higher odds of behavior change. **Conclusions:** Less than half of patients reported OOP costs in the same category as our database calculation; over 1-in-4 reported higher costs. Higher self-reported costs, but not database costs, were associated with behavior changes due to costs, and patients with lower incomes or more prescriptions may also be more likely to reduce adherence, switch to cheaper drugs, or experience financial burden due to costs.

Abstract PS2-21

Drug Use Among Medicare Subjects With a $1000 Prescription Drug Benefit Cap

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Background/Aims: Prior studies suggest that patients with a drug benefit cap decrease their treatment adherence and have poorer outcomes compared to patients with no limit. We examined differences in drug choice, adherence, and burden between patients who exceeded their cap and those that did not, focusing on subjects using a drug from at least one of five widely used therapeutic drug classes. **Methods:** All subjects were continuously enrolled members of Kaiser Permanente Northern California (KPNC) in 2003, had a $1,000 annual drug benefit cap, Medicare insurance, and were 65 years and older. We identified the five therapeutic drug classes most frequently used by these subjects in 2003 (anti-lipemics, beta adrenergic blockers, angiotensin converting enzyme inhibitors, narcotic analgesic combinations, and anti-ulcer drugs) and limited our analyses to patients with at least one dispensing from one of these classes in 2002. We assessed the mean number of study classes used and other prescriptions dispensed. We used logistic regression models to examine the association between exceeding the benefit cap and adherence and generic use within each class, adjusting for patient characteristics and drug burden. We also examined cost differences between drugs dispensed and the least expensive drug within the class. **Results:** Of the 97,922 subjects taking at least one of the study drugs, 15,926 (16%) exceeded the $1000 benefit cap in 2003. We found that subjects who exceed the benefit cap had a greater overall drug burden than patients who did not exceed the cap (2.4 vs. 1.8 study classes used; 25.1 vs. 11.8 dispensing of other drugs). After adjustment, patients who exceeded the cap were more likely to be adherent to their drug treatment regimen, but less likely to be a generic user compared to patients who did not exceed the cap, (e.g., anti-lipemics: 74% vs. 69% adherent, OR=1.3, 95% CI: 1.2-1.4; 56% vs. 84% generic users, OR=0.30, 95% CI: 0.28-0.31). In all study classes, patients who exceeded the cap predominantly received a drug that was not the least expensive option within the class (e.g., 83% received a higher cost anti-lipemic, mean annual difference overall = $286). **Conclusions:** Drug choice, adherence, and burden all are strongly associated with overall drug expenditures as expected. Many patients who exceed their available drug benefits, however, are not on the least expensive drug regimens available to them.

Abstract PS2-22

Impact of Co-payments on Patient Compliance and Persistence for Smoking Cessation Pharmacotherapy

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Background/Aims: Increasing patient co-payments commonly cause decreased medication adherence. This analysis evaluated the impact of co-payment on patient compliance and persistence with smoking cessation pharmacotherapy. **Methods:** Patients were identified from the Lovelace Health Plan (LHP) from January 1, 2000, to June 30, 2005, by a bupropion prescription claim (<300 mg/day), exclusive of a diagnosis for a mood disorder (ICD-9 311.X), with no more than 9 refills and with continuous enrollment 3 months prior and 12 months post the initial fill date. Patients were grouped into three co-payment groups: <$10, >$10 to <$20 and >$20. Compliance was calculated as the days of available therapy over indicated therapy (49 days) and persistence as the percentage of patients remaining on therapy at 15, 49 and 60 days. Patients were stratified by age, gender, ethnicity and comorbidities. Resource use and costs were collected for each group. **Results:** The study population consisted of 1732 subjects with 496, 330 and 292 in each of the co-payment categories and a cohort of 613 patients for whom the co-pay was not available. Patients who paid <$10 were the least compliant, with a medication possession ratio (MPR) of 0.7325 (CI, 0.7164-0.7486), and those who paid >$20 were the most compliant, with an MPR of 0.7646 (CI, 0.7614-0.8084). Compliance was associated with gender (0.7654 female vs. 0.7419 male), age (0.7634 age 40-64 vs. 0.7370 age 18-39), and ethnicity (0.7650 non-Hispanic vs. 0.7220 Hispanic). Persistence at 15 days was almost 100% for all three tiers. Persistence at 49 days was 0.3919 (CI, 0.3559- 0.4424) for the lowest co-pay cohort and 0.5358 (CI, 0.4784-0.5933, P<0.001) for the highest co-pay cohort. Persistence at 60 days followed the same trends as at 49 days. Females aged 40-64 and non-Hispanics demonstrated greater persistency. The impact of age, gender, ethnicity, and comorbidities on the results will be presented along with the resource use and cost distributions between groups. **Conclusions:** The more common relationship of increased cost-sharing to decreased adherence seen in other disease states may be the inverse for smoking cessation pharmacotherapy. Patient behavioral components, such as motivation to quit, may play a larger role.

Abstract PS2-23

The Associations of Medication Adherence with Employment and Work Disability Among Patients with Relapsing Remitting Multiple Sclerosis

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Background: To understand fully the economic impact of interventions designed to manage relapsing-remitting multiple sclerosis (RRMS), the impact of medication adherence on patient outcomes needs to be understood. This study examines the associations between adherence to commonly used disease modifying agents (DMAs) and employment or work disability among patients with RRMS. **Methods:** We used automated medical and pharmaceutical claims data along with data from patient charts to identify eligible study participants with RRMS and their adherence to DMAs. A mixed mailed/telephone survey administered to a cohort of 224 HMO insured patients with RRMS was used to solicit information on employment status and socio-demographic characteristics. A continuous measure of medication availability (CMA) expressed as the ratio of the cumulative days supply of DMA dispensed over 365 days was constructed for the year preceding survey administration. CMA ≥80% was used to identify patients who were adherent. We used multivariable logistic regressions to examine the associations between adherence and the probability of employment or work disability. Models controlled for patient age, gender, race, and comorbidities. **Results:** One hundred seventy patients responded to the survey (response rate: 76%). Our final sample was comprised of 111 patients who had been dispensed a DMA in the year preceding survey administration. Among these, 57% reported working at the time of the survey and 21% reported they were work disabled (i.e., had an impairment or a health problem that kept them from working). In the multivariable logistic model predicting employment status, being therapy adherent was associated with a greater likelihood of working (OR, 3.18; P<0.05). In the multivariable model predicting work disability, being therapy adherent was associated with a decreased likelihood of work disability (OR, 0.37; P<0.10). **Conclusions:** Our findings suggest that adherence to DMAs among RRMS patients is associated with a greater probability of employment and a lesser probability of work disability. In the assessment of the cost-effectiveness of interventions to improve medication adherence, the effects on employment and work disability of medication adherence should be considered along with those of medical care costs and other outcomes.

Abstract PS2-24

Diminishing Incentives: Drug Co-Payment Effects Over Four Years

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Background: There is limited information about how prescription drug cost-sharing effects change over time. **Aim:** In a natural experiment, we examined annual changes in prescription drug expenditures associated with having a two-tier prescription drug co-payment over a 5-year period. **Methods:** We examined 8224 adult Kaiser Permanente-Northern California commercially insured members with diabetes in January 2001 who were continuously enrolled from 2001-2005. In 2001, subjects paid $5 for prescription drugs. Starting in 2002, 66% of subjects paid $15 for brand-name drugs and $5 for generics (two-tier), while 34% of subjects had no changes (one-tier). There were no further changes in co-payments from 2002-2005. We used linear regression with a generalized estimation equations approach to examine annual prescription drug costs, truncated at the 99th percentile. We adjusted for patients' characteristics (age, gender, membership tenure, race/ethnicity, neighborhood social economic status and comorbidity) and secular trends (yearly indicators). We examined group differences (two-tier vs. one-tier) over time using group-year interactions and estimated adjusted prescription drug costs based on the model coefficients and mean values of the covariates. **Results:** The mean age of subjects was 51 years; 47% were female, and 40% were white. In the baseline year, 2001, the mean number of prescription fills was 26.5: 27.0 in the two-tier group and 25.6 in the one-tier group. The adjusted annual total prescription drug costs were $1342 and $1435 in the two-tier and one-tier groups, respectively (difference=-$93, 95% CI: -$168 to -$18). In 2002, the first year with a two-tier drug co-payment, annual drug costs decreased significantly among the two-tier group compared with the one-tier group (difference-in-difference =-$52; 95%CI: -$97 to -$8). In subsequent years, the magnitude of the changes were small and not statistically significant relative to the baseline year (difference-in-difference=-$38 for year two of the two-tier co-payment, 95%CI: -$85 to $10; -$38 for year three, 95%CI: -$87 to $11; and -$34, 95%CI: -$88 to $20). **Conclusions:** Introduction of a two-tier co-payment structure resulted in decreases in total prescription drug costs in the first year as expected. In subsequent years, however, changes in annual costs relative to baseline levels were smaller in magnitude and not statistically significant.

Abstract PS2-28

Using Natural Language Processing to Explore Schemes for Assessing Disease Risk from Free-Text Radiology Reports

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Background: Radiology reports are a form of clinical text that contains rich and useful information that is difficult to extract by automated means. The Cancer Text Information Extraction System (caTIES) is open-source software that uses natural language processing (NLP) techniques to identify concepts from standardized medical thesauri found in clinical text. Information derived from clinical text via NLP may be able to assist clinicians assess clinical risk of disease. We are exploring automated concept-coding of radiological exams of the abdomen in an effort to develop schemes for ordinal classification of clinical risk of diseases such as ovarian cancer.

Methods: We designated 63,681 pelvic ultrasound exams of 44,704 women performed during 1997-2006 as cases or controls. Cases included 214 exams of 188 women who received a pathologically confirmed ovarian cancer diagnosis within 1 year; controls include 63,467 exams of 44,516 women who did not. We divided all exams for cases and 10,000 randomly selected exams from controls into split-half development and validation samples (having 107 cases and 5000 controls each). The full text of development sample reports was concept-coded using caTIES. Guided by domain expertise and trial-and-error we developed an algorithm to identify cases and classified each report according to it. Expert review of the 107 case reports and random samples of 300 false positive and 300 true negative controls is ongoing, as is algorithm modification. The validation sample remains unused. **Results:** A simple algorithm employing concepts 'mass,' 'simple,' 'hemorrhagic,' and 'resolution' achieved sensitivity of 63% and specificity of 93%. Expert review indicates the algorithm may be improved by 1) focusing exclusively on concepts in the report's impression section, 2) incorporating additional concepts to identify true positives and exclude false positives, 3) developing custom NLP rules to associate organ systems and concepts referring to them, and 4) excluding concepts expressed in future and past tenses. **Conclusions:** Progress to date is encouraging for developing schemes useful for ordinal classification of clinical risk of disease. Opportunities for applying NLP to clinical text for medical research are numerous and caTIES appears to be a promising tool, especially if customized to perform domain-specific NLP tasks.

Abstract PS2-29

Incident Asthma Surveillance Using Electronic Medical Record (EMR) Data – Methods from the PASS and PASS2 Studies

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Background: Availability of longitudinal data from the electronic medical record (EMR) provides opportunities to monitor trends in the incidence and treatment of chronic diseases such as asthma. The Centers for Disease Control (CDC)-funded PASS studies developed, evaluated and implemented an algorithm for using the EMR to identify incident cases of asthma in the Kaiser Permanente Northern California (KPNW) region over a 5-year period. **Methods:** The original PASS study was carried out in two phases. In phase I candidate algorithms based on medication dispensings and asthma diagnoses from doctor visits were developed and piloted. A range of options for medication dispensing criteria, health plan eligibility, and length of the surveillance period were considered. The resulting algorithm was arrived at through a collaborative decision process involving the CDC and investigators from two field centers. In phase II the algorithm was validated by recruiting a subset of 219 randomly-selected patients identified by the algorithm as having incident asthma and collecting clinical and self-report measures from them, including pulmonary function tests. Two KPNW pulmonologists reviewed all information relating to each of these cases to arrive at a 'gold standard' asthma classification for these patients. **Results:** The final PASS asthma algorithm requires the following criteria be met: either two dispensings of asthma medication, or two or more visits at which asthma was noted as a diagnosis. The 'at-risk' population is identified by excluding those who meet these criteria in the 4 years prior to the year of interest and those who do not meet membership eligibility. Individuals in the resulting 'at-risk' population who meet the asthma criteria in the year of interest are identified as incident for asthma. The validation phase resulted in KPNW physicians rating 85% of the 219 charts reviewed as probable/possible asthma and 15% as unlikely. This represents a predictive value of 86%. This algorithm has subsequently been implemented in the 5-year PASS2 study which aims to, among other things, carry out asthma surveillance to determine the incidence and prevalence of physician-diagnosed asthma and develop and maintain a research database of incident asthma cases. The next step is to evaluate the scalability of this algorithm in other EMR-based systems. **Conclusion:** The PASS studies have demonstrated that it is feasible to develop and implement an EMR-based algorithm for asthma surveillance. Similar methods can be employed for other chronic diseases.

Abstract PS2-30

Care Coordination and Health Information Technology: Information Availability and Timeliness Across Care Transitions

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Background: Patients who require care by multiple clinicians are at risk for problems during these transitions. Use of an electronic health record (EHR) could provide clinicians a mechanism to coordinate activities and information, thereby improving care across transitions. We examined the impact of having EHR on the availability and timeliness of clinical information within an integrated delivery system. **Population:** All adult primary care clinicians (n=396 PCs) working in a large prepaid, integrated delivery system who completed the surveys in both 2005 and 2006. Overall, 57.3% were female, 48.9% were white, 83.1% were physicians, mean age was 45 years, and the mean panel size was 1540 patients. In 2005 only 2.0% of respondents had finished implementing the EHR at the time of their survey versus 39.4% in 2006. **Methods:** Using survey data collected in both 2005 and 2006, we examined clinician reports of the availability and timeliness of relevant clinical information when multiple clinicians are involved with their patients' care. We collapsed the five-point responses into two categories, e.g., high availability when the information was 'always' or 'usually' available. We defined EHR status as pre-, during, or post-implementation using the implementation dates for the medical center. Using multivariate logistic regression, adjusting for clustering by clinician, medical center, year, clinician gender, race, panel size, job title and status, we examined the association between EHR status and both clinical information availability and timeliness. **Results:** In year-one, 42.7% of PCs reported having high levels of clinical information availability, compared with 64.9% in year-two; 39.3% and 62.4% reported having high levels of timely information in years one and two, respectively. Overall, 35.3% and 57.8% reported having high levels of both information availability and timeliness in years one and two, respectively. After adjustment, clinicians working in medical centers that had completed the EHR implementation were significantly more likely to report having high levels of both clinical information availability and timeliness (OR=2.88; 95% CI, 1.46-5.69). **Conclusion:** EHRs could be an important tool for improving the timeliness and availability of clinical information. These improvements could facilitate the coordination of care between clinicians.

Abstract PS2-31

Virtual Data Warehouse 'High Utilizers'

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Background: The virtual data warehouse (VDW) was created as a mechanism for streamlining the process of proposing and conducting multi-site research by eliminating the need for custom data extraction programming at each site. At the core of the VDW are a series of standard file definitions. Content areas and data elements commonly required for research are identified, and data dictionaries created for each one. The data dictionaries specify a common format for each element —variable name, label, extended definitions, code values, and value labels. Local site programmers then developed programs to aggregate and transform their local legacy data into the standard VDW files. The data at the sites is thus made uniform, making it possible for multiple sites to run the same program against their local VDW data, and produce comparable results. The VDW is 'virtual' in the sense that the actual data remain at the local sites. It is not a centralized database held at a coordinating center and accessible only to a privileged few. Rather, it is a mechanism for sharing and reusing SAS code, and accelerating the research process. **Methods:** This poster presents data from 3 HMOs that shows how the VDW is used at these sites. **Results:** Programmers at Group Health, Kaiser Northwest, and Kaiser Colorado all use the VDW for more than multi-site projects. Using both automated file

auditing and surveys of staff we present information demonstrating how the VDW is used at the 3 HMOs. **Conclusions:** The original intent of the VDW was to increase efficiency in the use of data on multi-site studies. However, single site studies can also gain efficiencies from using the VDW and at some HMOs the VDW has become the first data source to use for almost all research. The VDW advantages of standard data structures and standard methods are also useful for single site projects.

Abstract PS2-32

Prescription Errors in the Electronic Medical Record: Provider Perceptions and Suggestions for Modification

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Background: Electronic prescribing has been purported to be the panacea in decreasing prescribing errors. However, the potential for problems has not been explored. **Aims:** To examine provider perceptions regarding the potential for prescription errors inherent in the electronic medical record (EMR) and possible solutions. This survey is part of a larger study to examine the frequency and sources of prescription errors in the EMR. **Methods:** All pediatricians, internists, family practitioners, cardiologists and oncologists within HealthPartners Medical Group were surveyed electronically. Questions included types of prescription errors, which were most problematic, impact of electronic prescription errors, frequency of errors, and suggestions for modifications. **Results:** One hundred nine out of 248 providers have currently completed surveys (45%); 52% were female, and 76% practiced for >10 years. Dosing errors (choosing wrong strength or form) were reported by 72% as being potentially problematic in the EMR, picking errors (choosing wrong medication from a list) were reported by 53%, errors in instructions (e.g., choosing bid vs. qid) by 48%, and 24% indicated other types of errors. Dosing errors were reported by half of all respondents to be most problematic, while 24% reported picking errors to be most common. Self-reports of the frequency of prescribing errors were: 9% >once/week, 34% once/month, 39% once every 3-6 months, 11% once/year, and 7% never. Using a five-point scale (1=no impact, 5=major impact), only 32% selected a 3 or higher to describe the amount that this issue impacts their practice. Concerns most frequently mentioned were issues involving dosing, inability to find desired drug, default instructions, lack of interface/communication with pharmacy, and accuracy and management of current patient medication lists. Suggestions for modifying the EMR to reduce errors included consistency in naming of medications, provider-specific drug lists, and simplifying or eliminating default directions. **Conclusions:** Providers perceive dosing errors as problematic when using the EMR. Although providers report an inherent potential for prescription errors, many do not feel that this issue has much of an impact on their practice. Suggestions for modifications should be explored to make future improvements in the electronic prescribing component of the EMR.

Abstract PS2-33

Enabling Quality of Care Metric Reporting Using an EMR

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Background: There is an increasing demand from local, state and national organizations to develop quality metric reporting in healthcare. At the same time there is both external and internal demand to not only report data, but to treat patients with multiple chronic diagnostic conditions in a cost effective manner. A model has been developed at Marshfield Clinic that offers a consistent, efficient, scalable and automated process to evaluate and report quality of care metrics and manage chronic disease populations. Data have been extracted from the electronic medical record (EMR), transformed into entity relationships, and loaded into an enterprise data warehouse to facilitate this model. **Methods:** A systematic approach has been developed to standardize the measurement of both process and outcome quality measures using the following key steps: (1) defining and documenting quality of care metrics for a population, (2) identifying patients with the population of interest, (3) attributing those patients to a care provider, (4) evaluating and validating data, and (5) providing feedback in the form of storyboards and also in the form of an intervention list application that is managed by medical staff. The first step clearly describes and documents the population of interest and quality of care metrics to be evaluated. The remaining four steps are programmatically automated for timely and efficient evaluation. **Results:** Programs run nightly on a client PC that evaluates the health record for 61,000 unique patients with four possible chronic diagnostic conditions and up to 33 metrics. The average run time of this nightly program over a given month is 4 hours compared to a recent mandated manual chart abstraction of 418 records and 5 measures that took a total of 46 hours to complete. A report for diabetes mellitus shows improvement for low density lipoprotein control of 14% over a 2-year period. **Conclusions:** This process demonstrates a model that is re-usable and scalable, providing an efficient delivery method of quality metric reporting. Quality of metric reporting using an EMR provides a consistent, standardized, and efficient feedback loop by having defined, retrievable data.

Abstract PS2-34

A Targeted, Age-Specific Alert Within an Electronic Medical Record to Reduce Inappropriate D-dimer Testing

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Background: The negative predictive value and accuracy of d-dimer assays for venous thromboembolism (VTE) worsens with patient age, meaning additional testing is not avoided in the majority of older patients. We evaluated the effectiveness of a computerized alert to reduce the number of tests ordered for these patients. **Methods:** We hypothesized that an alert at the time of d-dimer ordering for patients ≥65-years-old would decrease the rate of d-dimer testing for these patients. We randomized two groups of clinics. We analyzed the baseline rate of d-dimer orders/1000 patient visits, the rate in the intervention group, and the rate in the control group. After 18 months, the alert was activated for control clinic providers. **Results:** Rate of d-dimers orders/1000 clinic visits in intervention clinics before and after the alert was significantly reduced. We saw a reduced rate in the control clinics also, but it was smaller (possibly due to secular trend). After the alert was turned on in the original control clinics the rate was significantly smaller. The reduced rate persisted in the intervention clinic throughout the study. No significant rate changes were seen in patients <65-years-old.

d-dimer orders/1000 patient visits

≥65-years-old	**Baseline rate (no alerts)**	**Rate difference (95% CI)**
Intervention clinics	4.91	-3.36 (-4.05, -2.66)
Rate difference (95% CI)	-1.30 (-2.18, -0.42)	
Control clinics	3.61	-1.23 (-1.91, -0.55)
<65-years-old	**No alerts**	
Intervention clinics	4.07	0.30 (-0.18, 0.77)
Rate difference (95% CI)	-0.27 (-0.81, 0.27)	
Control clinics	3.8	1.53 (-0.31, 0.61)

Conclusions: A targeted electronic alert can change the ordering behavior of providers, decrease inappropriate test ordering, and may foster adherence to evidence-based guidelines for management of patients with suspected VTE.

Abstract PS2-37

An N-Gram Approach to Predicting Health Services and Generating Realistic Simulated Data

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Background/Aims: N-Grams are an established statistical tool for use in processing streams of tokens found in nature. "Tokens" can be words in speech or a document (as in natural language processing applications), nucleotide sequences (for genetic applications) or, we will argue, health service events (HSEs) such as diagnoses, procedures, and pharmacy fills occurring over time. We propose applying N-gram analysis to streams of HSEs observed in HMO administrative data, both as a method for analyzing actual health services, and also for generating realistic simulated data that are not subject to privacy or IRB concerns. Such simulated data could be used for applications where using real data would be too risky, or for developing code prior to actual IRB approval. **Methods:** N-grams are based on counting token co-occurrence in a reference dataset. The n=2 case is easiest to explain. By counting the number of times each token X is preceded by token Y in the reference dataset, a matrix of conditional frequencies is generated. This matrix is then normalized and smoothed, resulting in a matrix of conditional probabilities that any given X is preceded by Y. **Results:** The resulting matrix will be interesting to study in its own right. While many of the high-probability co-occurrences will be obvious and well-known, there certainly will be some (particularly those where the time intervening between events X and Y is long) that are not, and that will bear investigation. Thus, the matrix is a tool for hypothesis generation. Further, the matrix can be used to generate realistic streams of simulated HSEs. A starting token is chosen at random, using the matrix probabilities as weights (e.g., if a checkup visit occurs twice as frequently as a starting HSE than a flu diagnosis, then the checkup visit would be approximately twice as likely to be chosen for a starting token). Once the starting token is chosen, a next token is randomly drawn from a weighted sample based on the starting token, and so on, each token providing the sample weights for the choice of the next token. In this way, any amount of data can be manufactured. **Conclusions:** Applying N-grams from HSE streams will offer unique opportunities to investigate event co-occurrence, and provide simulated data useful for testing purposes.

Abstract PS2-38

Formalization of the Laboratory Result Content Area of the VDW

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Background: The availability of comparable laboratory (lab) results across sites will expand the abilities of the HMO Research Network (HMORN) to perform collaborative research. The Coordinated Clinical Studies Network (CCSN) funded research to define the process of adding a lab result content area to the virtual data warehouse (VDW). We describe the development efforts and implementation steps required to create and maintain a laboratory result content area that is equivalent in definition across HMORN sites. **Methods:** Existing information about lab data and coding systems at HMORN sites was reviewed, and we surveyed sites about current lab data. Sites were specifically asked about the availability of Logical Observation Identifiers Names and Codes (LOINC), which are a set of universal names and ID codes for identifying lab and clinical test results. To enable sites to participate in lab research studies, written instructions for incorporating lab tests, including a data dictionary, were prepared. The accuracy of the instructions was assessed for selected tests: serum creatinine and potassium, international normalization ratio, glycated hemoglobin, and fasting blood glucose. When a lab test is to be added to the laboratory content area, the lead site determines a list of LOINC codes that are interchangeable at a component level for that lab test. Sites that have incorporated LOINC into their lab database use this list to pull data. Each site without LOINC and each site where data are needed for time periods prior to LOINC availability will determine a list of local codes. Data pulled by LOINC and data pulled by local codes are tied together by a common test type. **Results:** Most HMORN sites indicated they had the LOINC code set available. Kaiser Permanente Colorado is working with several other HMORN sites on hypertension studies. These sites are beginning to implement this process, utilizing LOINC and local codes from 2002 forward. This will be the first large-scale test of the lab component of the VDW. **Conclusions:** Implementing the lab content area requires upfront effort from the lead site for each lab test. Each participating site must also invest time determining its local codes. The aggregate information from all sites participating in a study will enhance the usefulness of the VDW to epidemiological, observational, and interventional research in the HMORN and in other collaborative efforts.

Abstract PS2-41

Tumor Registry Content Area of the Virtual Data Warehouse

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Background: The virtual data warehouse (VDW) was created as a mechanism to produce comparable data across health systems for the purpose of facilitating multi-site research within the Cancer Research Network (CRN). Each site maintains its own standardized files according to mutually agreed upon dataset definitions. The common structure of the VDW files enables a site programmer to distribute a SAS program to all participating sites that, with minimal modifications, can run against their local VDW. The program produces de-identified summary results that can be transferred to the coordinating site programmer. The Tumor content area is just one of eight standardized files maintained at each of the local CRN sites with tumor registries or access to tumor registry data. **Methods:** The Tumor content area was one of the first to be developed by the Scientific & Data Resources Core. The common format for each element of the Tumor content area, variable name, label extended definitions, code values and value labels, was largely driven by the data standards as defined by the North American Association of Central Cancer Registries. The Tumor content area contains detailed information on patient demographics and incident primary tumors such as date of diagnosis, ICD-O site, morphology, stage at diagnosis and first course of treatment. Eleven CRN sites maintain a Tumor content area for the VDW. **Results:** The Tumor content area has been used for case identification in several funded multi-site CRN studies. Additionally, the Cancer Counter on the CRN website uses aggregate data from the Tumor content areas of all CRN sites to provide counts of primary tumors for every combination of selected variables. The Cancer Counter has proven to be a valuable tool in facilitating proposal development. **Conclusions:** The standardization of the Tumor content area across CRN sites enables the sharing of compatible data in multi-site studies by improving programming efficiency, accuracy and completeness of data.

Abstracts received on September 11, 2008

doi:10.3121/cmr.2008.849