(BMI) >40 and without a diagnosis or prior evaluation for sleep apnea were invited to complete the “STOP” questionnaire, a self-administered validated screening tool consisting of 4 “yes/no” questions; “yes” answers to 2 questions identify individuals at high risk of having OSA. Patients who screened positive were then contacted to schedule a sleep medicine evaluation. **Results:** Electronic invitations were sent to 2,283 eligible patients to take the questionnaire; 279 (12%) completed and submitted their responses. Based on their answers, 122/279 (44%) were identified as being at high risk for having OSA and recommended to undergo evaluation in the sleep clinic. To date, 104/122 patients (85%) were offered an appointment with a sleep specialist; the remaining 18 (15%) are waiting scheduling. Of those offered a clinic appointment, 41/104 (40%) have undergone a sleep medicine evaluation, 38/104 (36%) are waiting to be scheduled, and 25/104 (24%) cancelled or did not keep their appointment. Of the evaluated patients, 38/41 (93%) were diagnosed with OSA, 2/41 (5%) had negative sleep studies, and 1/41 (2%) are awaiting polysomnographic evaluation. The positive predictive value of the STOP questionnaire among patients who underwent polysomnography was 95%. **Conclusions:** This pilot study suggests that utilizing an internet-based patient portal via the EHR can identify patients at high risk of OSA and facilitate their ultimate evaluation and diagnosis through the administration of a simple questionnaire.

Keywords: Obstructive sleep apnea, Sleep apnea screening
doi:10.3121/cmr.2011.1020.c-b4-02

PS1-20:

Developing an Ontology: Informatics for Integrating Biology & the Bedside (I2B2) and Structuring the Virtual Data Warehouse (VDW) Content Areas

Dustin Key, MAS, BA¹; Gene Hart, MS¹; Garth Arnold, BA¹; David Eastman, BS²

¹Group Health Research Institute; ²Kaiser Permanente Southeast

Background/Aims: Informatics for Integrating Biology & the Bedside (I2B2) offers a dynamic graphical interface for querying VDW data. Part of the I2B2 effort involves designing the drop-down menu of standardized nomenclatures provided by coding schemes such as CPT-4, ICD-9, and RxNorm, by which the user queries the data. This menu of content hierarchies can be complex in terms of the number of nodes and levels of nested folders. In addition, there often isn't an established way to organize these codes into categorization scheme that allows for a clean and organized querying interface. **Methods:** We will demonstrate the use of SAS and SQL to craft these hierarchies and how to leverage the resources provided by the Unified Medical Language System (UMLS) along with resources that may be available at your local site. **Results:** We have been able to develop an ontology that spans many of the VDW content areas including Procedures, Diagnoses, Pharmacy Fills, Vitals, Demographics, Tumor, and Enrollment. **Conclusions:** It is possible to build an ontology that organizes the various coding schemes using SAS and SQL, sourcing public resources such as UMLS. Therefore, our knowledge about building an ontology can be readily transferred across HMORN sites and other consults, empowering additional I2B2 deployments. The development of an ontology for VDW subject areas may have additional uses insofar as organizing standard nomenclatures in a programmatic way is useful.

Keywords: Ontology, I2B2, SAS
doi:10.3121/cmr.2011.1020.ps1-20

PS1-32:

Psychology in Primary Care: An Evaluation of Best Practices

Karon Phillips, PhD, MPH¹; Emily Smith, MSPH¹; Alan Stevens, PhD¹

¹Scott & White Healthcare

Background/Aims: Integrating psychology and mental health professionals into primary care settings has emerged as a means to improve the access to and utilization of mental health services. Three main delivery models of psychology in primary care settings have emerged: (1) referring a patient to

a psychologist/mental health professional located in a facility outside of the primary care physician's (PCP) office; (2) referring a patient to a co-located psychologist/mental health professional who does not directly interface with PCP; (3) integrated and co-located model where the PCP and the psychologist/mental health professional discuss the patient's health. The overall purpose of this project was to compare patient utilization of psychology/mental health services across the Scott & White Health care system. **Methods:** Using electronic medical records and the virtual data warehouse (VDW), mental health clinics/facilities were categorized into one of the three main psychology models. Patients that had depression, anxiety or ADHD DRG codes in their EMR and were aged 18 and older (n=37,310) were included in the analysis. The following additional variables were controlled for: gender, race/ethnicity, and chronic physical health conditions (i.e. arthritis, lung disease, heart disease, diabetes, hypertensive disease, and osteoporosis). ANOVA/ANCOVA analyses were performed to determine the differences across the three models in the length of time between the PPC referral and the first appointment with the psychologist/mental health professional. **Results:** Patients that were seen by psychologist in facilities with integrated co-located models of care experienced a shorter amount of time between their referral and their first appointment with the psychologist/mental health professional, compared to the other two models of care. **Conclusions:** These initial results begin to inform best practices for delivering mental health services within primary care and provide physicians and health care systems with data on issues that facilitate integrated, person-centered care.

Keywords: Psychology, Best practices, Primary care
doi:10.3121/cmr.2011.1020.ps1-32

PS1-28:

The Grid-Enabled Measures (GEM) Database: A Research Tool to Facilitate the Use of Standardized Measures and Data Sharing

Richard Moser, PhD¹; Min Hua, PhD²; Paul Courtney, MS³; Dianne Reeves, RN, MSN¹; Riki Ohira, PhD⁴; Abdul Shaikh, PhD, MHS¹; Bradford Hesse, PhD¹

¹National Cancer Institute; ²Fox Chase Cancer Center; ³SAIC-Frederick Inc/ National Cancer Institute at Frederick; ⁴Booz Allen Hamilton

Background: We are in an era of unprecedented access to data and the potential to move areas of science forward rapidly but currently there is a lack of coordination of research efforts in regards to: 1) Using standardized measures; and 2) sharing harmonized data. The Grid-Enabled Measures (GEM) database has been conceptualized by the National Cancer Institute (NCI) to help accomplish these goals. **Methods:** GEM encourages and enables standardization of measures and data harmonization by supporting a virtual community of researchers who interact with each other using Web 2.0 technologies. Through GEM, researchers are able to upload health-related measures and associated meta-data for use by others and provide comments and ratings about these measures and their associated theoretical constructs. Input from users—including ratings, usage statistics and psychometric properties of the measures—established criteria to prioritize measures to be curated for use on the Cancer Biomedical Informatics Grid (caBIG®). Curation starts with models that are used to represent the measure and its items in a form understandable to both researchers and informaticians. The outcome of the curation process is registration of a measure as a caBIG® common data element so that the variable representing the measure's score can be shared via the grid. **Results:** Models for measure curation have now been developed for five measures in GEM (e.g., Center for Epidemiologic Studies Depression Scale (CESD)). GEM currently has 216 registered users and 110 measures based on 73 constructs and these numbers will change over time with user interaction. Next steps in developing GEM include making datasets—based on GEM-curated measures—available on the grid for use by other systems and users connected to caBIG®. **Conclusions:** GEM represents a critical step in advancing the research enterprise and complements other NIH-funded systems being developed such as Phen-X (consensus measures for Phenotypes and eXposures) which seeks to build consensus measures used in genome-wide association studies. In addition to describing the rationale and development of GEM and how measures and data are curated into caBIG®, this presentation will include a live demonstration of the site

and describe the results of dissemination efforts with professional organizations.

Keywords: Standardized measures, Data harmonization

doi:10.3121/cmr.2011.1020.ps1-28

C-B4-04:

Overestimation of Population Level Medication Adherence: Bias in the MPR Calculation of Hypertensive Patients

James Pitcavage, MSPH¹; Joseph Leader, BS¹; Jove Graham, PhD¹; H. Kirchner, PhD¹; J.B. Jones, PhD, MBA¹

¹Geisinger Center for Health Research

Background/Aims: The Medication Possession Ratio (MPR) is a common claims-based metric for describing medication adherence. The MPR can only be calculated for patients who fill at least 2 prescriptions. Thus, patients with <2 prescription fills are excluded from the MPR denominator in population-level adherence reports. Combining prescription-ordering data available in an electronic health record (EHR) with matching claims data, we characterized the population excluded from a MPR-based adherence calculation. **Methods:** We conducted a retrospective (2004-2008) analysis of EHR and claims data for patients treated in the Geisinger Clinic. Hypertensive patients continuously enrolled for at least two years in the Geisinger Health Plan (GHP) with GHP pharmacy benefit coverage were identified using blood pressure (BP) data in the EHR and ICD-9 codes associated with clinic encounters. For all patients with an EHR order for an angiotensin converting enzyme inhibitor (ACEI) or an angiotensin receptor blocker (ARB), we matched each EHR order with the corresponding claim if one existed. **Results:** We identified 89,403 patients with hypertension, of whom 14,387 (16.1%) had at least 2 years of continuous pharmacy benefits. Median age was 67 years and 51% of the cohort was female. There were 4,934 patients with = 1 order for an ACEI and 1,251 patients had = 1 order for an ARB. The MPR could not be calculated for 18.8% (n=928) of patients based on ACEI orders and for 32.3% (n=404) of patients based on ARB orders. Patients for whom the MPR could not be calculated had a higher systolic BP than patients with an MPR measure (137 compared to 134 for patients with an ACEI; 139 compared to 134 for ARBs), and a higher diastolic BP (77.91 compared to 76.92 for ACEI; 76.16 compared to 75.33 for ARBs). **Conclusion:** In this primary care population, a sizable proportion of patients failed to fill more than one antihypertensive prescription. These patients are likely to be excluded from population level adherence estimates. Further analyses will examine differences between the “MPR” cohort and those patients excluded from the calculation.

Keywords: Medication adherence, MPR

doi:10.3121/cmr.2011.1020.c-b4-04

PS1-16:

The Role of Health Information Technology Regional Extension Centers in Health Care Transformation

Margaret Gunter, PhD¹; Lyndi Dittmer-Perry, PMP¹; Shelley Carter, RN, MPH¹; April Salisbury, MBA¹; Dave Perry¹

¹LCF Research

Background/Aims: To encourage the adoption and “meaningful use” (MU) of electronic health records (EHRs) as part of health care reform and the ARRA stimulus legislation, the federal government is providing financial incentives to providers who adopt certified EHRs and meet criteria for their meaningful use. The federal Health Information Technology (HIT) Regional Extension Center (REC) program was created to provide technical assistance (TA) to priority primary care providers (PPCPs) in small practices to help them adopt EHRs and qualify for MU incentives. The New Mexico HITREC is one of 62 nationally, each of which will assist 1000+ providers. Such groundbreaking incentives and assistance present a potential EHR “tipping point” for small practices. **Methods:** NM HITREC recently began to address its goals for the two year funding: Outreach to educate providers through conferences, presentations, and one-on-one contacts concerning the MU criteria and incentives and the benefits of the TA available through the REC; recruitment of PPCPs willing to adopt EHRs and receive HITREC assistance;

promotion of HIT workforce training programs; assisting providers with selecting and implementing EHRs; connecting to the state’s health information exchange; using EHRs for performance measurement and other MU criteria; sharing effective tools with other RECs; and participating in local and national evaluation efforts. New one-on-one recruitment procedures have been undertaken recently and are proving more effective. **Results:** NM HITREC is in its early months of recruitment, and has signed approximately one fourth of the potential providers as of November 1, 2010. This number is under the goal set for this stage, but the rate of recruitment has been increasing using the new recruitment techniques. It is anticipated that 800 or more will be recruited by late March, 2011. These results will be reported at the March conference, along with early EHR implementation successes and insights. **Conclusions:** It is anticipated that the experience gained by the RECs will expedite the implementation of EHRs in small practices and provide guidance even to large and specialty practices seeking to achieve MU. This in turn should have a transformational effect on quality and efficiency for providers in all practices.

Keywords: Electronic health record, Meaningful use, HIT Regional Extension Center Program

doi:10.3121/cmr.2011.1020.ps1-16

PS1-15:

Fathoming the Depths – Looking for Treasure in the Electronic Medical Records of Western Washington Network Enrollees

Jane Grafton, BA¹; Luesa Jordan, BA¹; Patty Yarbrow, MSW¹; Mary Sunderland¹

¹Group Health Research Institute

Background/Aims: When a particular health event or condition is uncommon, researchers consider broadening the target population. All Group Health (GH) patients have an electronic medical record (EMR). However, GH EMR implementation has only occurred at GH-owned clinics. For studies requiring medical record review in addition to other data collection, the practice has been to include only enrollees at GH-owned clinics. However, perhaps EMR data are more widely available. We conducted a pilot study of: How many GH network enrollees (i.e. enrolled at non-GH owned clinics) have GH EMRs that contain clinical data? What kinds of visits generate rich data in the EMR for network enrollees? **Methods:** Our population was Group Health (GH) enrollees enrolled at network clinics in western Washington. Although this population is demographically comparable to enrollees at GH-owned clinics, the assumption has been that clinical data in the EMR is missing or meager, making them poor candidates for studies requiring chart review. We examined 4 indicators (patient use of the shared medical record, or presence of scanned documents, transcriptions, or vitals in EMR automated data). We chose these as likely markers of clinical information in the GH EMR, and randomly selected 5 enrollees for each indicator and reviewed their EMRs. **Results:** Among enrollees at network clinics, 20% (10,327/51,637) had at least one of the four selected indicators. Only 1 of the 20 records reviewed had no clinical EMR data. The best indicator of a rich EMR was presence of vitals. **Conclusion:** Enrollees at network clinics with visits to GH clinics (or with recorded vitals in EMR automated data) may thus be a suitable target population to add to studies that include chart review. However, this may only add 1/5 of all network enrollees to a study population. Future investigations might include: 1) Select enrollees at network clinics with hospitalizations to see what outside utilization is captured by the GH EMR; 2) Examine how health plan type affects availability of EMR data.

Keywords: Electronic medical record, Network

doi:10.3121/cmr.2011.1020.ps1-15

PS1-01:

Infrastructure Setup for the Informatics for Integrating Biology and the Bedside Framework

Garth Arnold, BA¹; Gene Hart, MS¹; Dustin Key, BA, MS¹; David Eastman, BS²