on errors found using review tools, and strategies to overcome identified barriers to using the tools.

Keywords: Quality improvement; Analytics

doi:10.3121/cmr.2014.1250.ps1-21

PS1-22:

Final Results from a Study of the Implementation of the Collaborative Care Model for Primary Care of Depression (DIAMOND) in 76 Clinics in Minnesota

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Background/Aims: The collaborative care model for primary care of depression has a very strong evidence base, but has been little implemented. A statewide initiative (called DIAMOND) to implement it widely in Minnesota along with a new payment provided an opportunity for an embedded partnership research study of its implementation and impacts on the use of evidence-based care processes and depression symptoms for patients with depression. **Methods:** All 76 clinics participating in the staggered implementation initiative agreed to cooperate with the study. Potential patient subjects were identified from weekly submission of new antidepressant fills by seven health plans for a baseline and 6 month follow-up survey of care received and PHQ9 scores. Medical and administrative leaders of clinics completed implementation surveys at baseline and 1 and 2 years after implementation. **Results:** 2,348 patients with depression completed baseline surveys and 1,578 (67%) subjects completed 6 month follow-ups. Of those with follow-up data, 245 received DIAMOND care, 466 received usual care in DIAMOND clinics pre-implementation, 559 received usual care post-implementation, and 308 received usual care in clinics that signed up for DIAMOND but never implemented it. We have data on the extent of implementation and depression remission rates for each of these groups and they will be ready for presentation at the conference. **Conclusions:** To be announced at the conference.

Keywords: Depression; Pragmatic trial

doi:10.3121/cmr.2014.1250.ps1-22

PS1-35:

Transition to Electronic In-clinic Data Capture of Questionnaires Increases Collection Rates

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Background/Aims: Geisinger bariatric surgery patients complete questionnaires at various points throughout the program as part of their standard care. Until recently, this was done using paper copies completed at home, resulting in unacceptably low response rates. Opportunities to capture missed responses exist, but are difficult to identify in a busy medical clinic. The purpose of this study is to improve patient questionnaire completion rate using in-clinic capture while minimizing the impact on clinic efficiency. **Methods:** Planning meetings for implementation of the in-clinic collection process involved various stakeholders including researchers, clinicians, nurses, and front desk staff. Several options were considered for location (waiting room versus patient room) and for collection tool (tablets versus touch screens). The stakeholders agreed to implement a process using touch screens in the patient room. This process was piloted and patient interaction with the tool was evaluated. A 15 minute visit was prepended to the patients regularly scheduled visit to allow time for completion. Specialized software was used to implement and collect the touchscreen responses. Historical collection rates were compared to the pilot results. **Results:** During the pilot, 50 of 52 patients (96%) completed the touchscreen questionnaires. Mean time for completion of 140 questions was 15 minutes, which fell within the estimated time of our prepended visit. Time for the nurse to introduce the tool was under 2 minutes. While 38% of patients described some issue with using the tool, all patients rated the ease of use as 'Easy' or 'Very Easy'. Specific issues included patients understanding of the questions and first time use of

a touch screen. The completion rate during the pilot was significantly higher than the historical completion rate (96% versus 65%, $P < 0.0001$). **Conclusions:** Capture of in-clinic electronic questionnaires is feasible, but requires full support from providers, nurses, and front desk/scheduling staff. Long term integration may provide higher capture rates, which may result in improved patient care (i.e. allow the providers to directly address any issues raised by the responses) and better research.

Keywords: Questionnaire; Electronic capture

doi:10.3121/cmr.2014.1250.ps1-35

PS1-49:

Comparative Health Systems Research among Integrated Delivery Systems and Managed Care Organizations: A Systematic Review

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Background/Aims: Due to rising health care costs and wide variations in quality, the U.S. health care system is undergoing rapid changes that include payment reform and movement towards integrated delivery systems (IDSs). Well-established IDSs, such as Kaiser Permanente (KP), must begin to identify the specific system-level factors that results in superior patient outcomes in response to policymakers' concerns. Comparative health systems research is one area that can provide insights into what particular aspects of the IDS results in improved care delivery. The objective of this systematic review was to examine the existing published studies on comparative health systems that relate to IDSs and KP to obtain a baseline understanding of the state of comparative health systems research to provide foundational knowledge. We also sought to identify the gaps in the literature on comparative health systems research. **Methods:** We conducted a literature search on PubMed and an internal KP Publications Library. Studies that compared KP as a system or organization to other health care systems, or across KP facilities internally were included. The literature search resulted in a total of 1,605 articles, of which 65 met the study inclusion and were examined by three reviewers. **Results:** The majority of comparative health system studies focused on intra-KP comparisons ($n = 42$). Fewer studies compared KP to other U.S. health care system ($n = 15$) or to international health care systems ($n = 12$). **Conclusions:** Of all studies published by or about KP, only a small proportion of articles were identified as being comparative health systems research. Additional empirical studies that compare the specific factors of the IDS model with other systems of care is urgently needed to better understand the "system-level" factors that result in improved and/or diminished care delivery.

Keywords: Integrated delivery systems; Comparative health systems

doi:10.3121/cmr.2014.1250.ps1-49

Genetics

PS2-15:

Racial Disparities in Biobank Participation among Men in Southern California

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Background/Aims: Previous research suggests that participation of men in research is particularly low. We sought to identify predictors of participation among men in different racial groups in order to optimize future recruitment strategies. **Methods:** We assessed predictors of participation on randomly selected Kaiser Permanente Southern California male members = 18 years of age ($n = 90,199$) between November 2012 and June 2013. Men were asked to provide saliva samples for a research biobank. Potential predictors of participation were age, long-term membership ($= 5$ years), no significant gaps in health care coverage (< 3 month in last 3 years), physical examination within the last 3 years and neighborhood education and income. **Results:** Overall participation among men was 4.4%. Restricting recruitment to men with at least 5 years of membership, no significant gaps in health care coverage, and at least one physical examination, improved participation from

5.3% to 10.6% in Whites, and from 1.0 % to 2.7% in Hispanics but only modestly in Blacks from 1.5% to 2.3%. In logistic regression models predicting participation, the most important predictors of participation were having at least one physical examination (OR 1.46, 95%-CI 1.34-1.59) in Whites and long-term membership in Hispanics (OR 1.38, 95%-CI 1.11-1.69). None of the restrictions significantly predicted participation in Blacks (p for interaction with race <0.001). **Conclusions:** The application of restrictions based on longer membership and regular physical examinations may increase recruitment of non-Hispanic White and Hispanic men for biobank participation.

Keywords: Biobank; Racial disparities

doi:10.3121/cmr.2014.1250.ps2-15

PS2-16:

Racial Disparities in Biobank Participation among Women in Southern California

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Background/Aims: The aim of this study is to identify predictors of participation in women of different racial groups to optimize future recruitment efforts. **Methods:** We randomly selected and assessed predictors of participation on Kaiser Permanente Southern California adult female members (n = 107,378) between November 2012 and June 2013. Women were asked to provide a saliva sample for a research biobank. Potential predictors of participation were age, long-term membership (= 5 years), no significant gaps in health care coverage (<3 month in last 3 years), physical examination within the last 3 years and neighborhood education and income.

Results: The overall participation among women was 6.8%. Restricting recruitment to women with = 5 years of membership, no major gaps in health care coverage, and at least one physical examination within the last 3 years improved participation in Whites (from 7.1% to 14.3) and Hispanics (from 2.5% to 5.0%) but only modestly in Blacks (from 2.0% to 3.6%). In logistic regression models predicting participation, the strongest predictors in Whites and Hispanics were having a physical examination (OR 1.25, 95%-CI 1.17-1.33 in Whites and 1.45, 1.28-1.65 in Hispanics) and long-term membership (OR 1.19, 95%-CI 1.12-1.27 in Whites and 1.32, 1.16-1.50 in Hispanics). None of the restrictions significantly predicted participation in Blacks (p for interaction with race <0.001). **Conclusions:** Applying restrictions based on regular physical examinations and longer membership may potentially increase participation of non-Hispanic White and Hispanic women in a research biorepository.

Keywords: Biobank; Racial disparities

doi:10.3121/cmr.2014.1250.ps2-16

Health Informatics

B1-1:

Predictive Modeling to Identify Patients at Risk for Index Hospitalization

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Background/Aims: Preventable hospital readmissions are the focus of many performance metrics. However, little attention has been given to preventing index admissions. The likelihood of hospitalization (LOH) is a statistical model (Verisk Analytics®) which uses patient historical clinical data and logistic regression to predict the likelihood of admission in the next six months. One of our goals was to test the accuracy of the LOH model to predict hospitalizations. The second goal was to identify possible common intervenable causes for the hospitalization. **Methods:** We obtained the list of patients with LOH scores in the top 1% calculated as of July 1, 2012. We then retrospectively identified which of these patients had hospitalizations in the following 6 months. We censored patients who had hospitalizations related to trauma and pregnancy. We performed chart reviews on a subset of the hospitalized patients and classified reasons for the admission into intervenable or non-intervenable causes. **Results:** Of the patients in the top 1% of LOH (N = 1460; mean LOH = 0.47), 412 (28.2%) were hospitalized within 6

months of the LOH calculation date. The average age and percent female for hospitalized and non-hospitalized patients was 74.1 years, 57.8% and 73.4 years, 60.0%, respectively (not significant). 324 of the hospitalized patients had no emergency department visits in the prior 6 months. Fifty percent of hospitalizations occurred within 33 days of the LOH calculation date. We performed chart reviews on 134 (32.5%) of the hospitalized patients. Twenty-eight patients (20.9%) were classified with intervenable causes for the admission, 19 (67.9%) of which were related to system issues such as inadequate follow-up after procedures or medication adjustments.

Conclusions: Identifying patients with intervenable causes for hospitalizations may significantly decrease unnecessary admissions. Risking algorithms may have utility in developing strategies to identify these patients. Risk of Hospitalization (RHO2) uses near real-time clinical data from the electronic medical to calculate risk scores. Future studies will compare the performance characteristics of LOH to RHO2 to identify overlapping cohorts of patients. If RHO2 performs as well as LOH, we will use the near-real time clinical data in RHO2 to flag patients with intervenable causes of hospitalization at the point-of-care.

Keywords: Predictive modeling; Risk profiling

doi:10.3121/cmr.2014.1250.b1-1

B1-3:

Improving Surgical Case Duration Accuracy with Advanced Predictive Modeling

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Background/Aims: The Operating Room (OR) is a large source of revenue and one of the most costly departments in a hospital. Scheduling surgeries into an OR is complicated by the inherent uncertainty associated with each surgery. The case length of a surgery at Geisinger is predicted using a moving average of the 10 previous procedures performed by a given surgeon. A process capability analysis was performed to gauge the ability of each surgical procedure to be within ± 15 minutes of scheduled time. This analysis demonstrated a low process capability across all surgeries. This research aims to create a process to better predict the surgical case length by leveraging the Electronic Health Records, which can enable more efficient scheduling and use of the ORs. **Methods:** Based on a literature review and the results of an internally conducted survey of OR staff, a dataset was constructed with 135 predictors. A test dataset was randomly separated from the training dataset for validation. Predictive models were developed using Stepwise Linear Regression (LR) and Artificial Neural Networks (ANNs). Multilayer Perceptron ANNs with 2 hidden layers using a sigmoid transfer function and Delta Bar Delta learning algorithm tended to perform the best. The final model contains the 39 most sensitive predictor variables from the ANN model and the LR model. **Results:** In all cases, the predictive models significantly improved the case duration accuracy. The ANN models outperformed the LR models on 3 of the 5 high-volume procedures. The greatest improvement over the baseline occurred for the ANN model for Arthroplasty Total Hip, where case duration accuracy improved from 32.1% (80 of 249 test cases) to 59.0% (147 of 249 test cases) for an improvement of 83.7% (improving to 59.0% from 32.1%). **Conclusions:** The ANN and LR models can be used to significantly enhance the predictability of surgical schedules. Even with the significantly enhanced predictability of surgical case lengths, the 5 investigated high-volume surgeries are still not necessarily process capable with respect to ± 15 minute specification limit.

Keywords: Predictive modeling; Operating room

doi:10.3121/cmr.2014.1250.b1-3

B1-4:

eCare for Moods (TM), A Patient-centered, Web-delivered Self-management and Care Management Program for Recurrent Depression: Results from Randomized Trial

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