DOES IMPROVED CONTINUITY OF PRIMARY CARE REDUCE AMBULATORY CARE SENSITIVE HOSPITALIZATIONS IN VA? David A Katz, Kim Mccoy; Mary Vaughn-Sarrazin. 
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BACKGROUND: Recent changes in healthcare delivery, including the movement toward more team-based care, have reduced the likelihood of patients seeing the same primary care provider (PCP) at repeated visits. Prior studies suggest that decreased longitudinal continuity of care (COC) increases emergency department visits and unplanned hospitalizations, but evidence is mixed. The aim of the study is to evaluate the association between longitudinal continuity of care (COC) and hospitalizations for ambulatory care sensitive conditions (ACSCs) in VA outpatients.

METHODS: We conducted a retrospective cohort study of 170,487 VA outpatients who were assigned to a VISN 23 primary care provider (PCP) and had at least one primary care visit to physicians or physician extenders during each of three years (FY2007-09). Data from the 2007 Patient Care Management Module were linked to VA outpatient and inpatient datasets (including non-VA admissions to private sector hospitals that were paid for by the VA). Clinic stop codes were used to identify primary care visits; telephone contacts, home-based contacts, or contacts with a non-PCP were excluded. Three measures of longitudinal COC, Usual Provider of Continuity (UPC), Modified Modified Continuity Index (MMCI), and Known Provider Continuity (K index), were calculated for each eligible VISN 23 primary care patient (on a scale of 0-1, where 1 is perfect continuity); each measure was grouped into high, intermediate, and low COC categories. Using Proc GLIMMIX, multivariable random effects logistic regression models were used to predict hospitalization for ACSCs (based on AHRQ quality indicators) during FY2009. Separate models were fit for each COC measure, controlling for demographics, disability status, chronic medical and psychiatric conditions (Elixhauser comorbidities plus generalized anxiety disorder and post-traumatic stress disorder), history of prior ACSC hospitalization during FY2007-2008, and usual site of care (modeled as a random effect).

RESULTS: The mean number of primary care outpatient visits was 4.3, and 1.9% were hospitalized for an ACSC during FY2007-08. The mean values of UPC, MMCI, and K-index were 0.77, 0.76, and 0.75, respectively; 51% of outpatients had high continuity (UPC=1), whereas 35% and 14% had intermediate (UPC=0.50-0.99) and low (UPC<0.50) continuity, respectively. In multivariable models, low and intermediate UPC was associated with an increased odds of ACSC hospitalization: adjusted OR (95% CI)=1.53 (1.34, 1.74) and 1.46 (1.32, 1.63), respectively. Using the K-index, which explicitly accounts for number of providers, low and intermediate COC groups demonstrated an increased odds of ACSC hospitalization: adjusted OR (95% CI)= 1.27 (1.09, 1.47) and 1.56 (1.40, 1.73), respectively; similar results were obtained for the MMCI measures.

CONCLUSION: Longitudinal continuity of VA primary care compares favorably to that reported in non-VA settings. Reductions in PCP continuity may significantly increase the risk of ACSC hospitalizations. Innovative models of care such as the Patient Centered Medical Home need to be monitored for unintended reductions in continuity with the patient's PCP.
Variation in Prescription Use among Patients with Diabetes in the VA Healthcare System

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BACKGROUND:
Regional variation in healthcare use has become a primary indicator of inefficiency in the healthcare system, yet little is known about variation in medication use. The Veterans Health Administration (VA) offers a unique setting to assess regional variation in prescription use, because of its unified national formulary and pharmacy benefit. We sought to examine regional variation in outpatient medication use for the treatment of diabetes.

METHODS:
We conducted a cross-sectional analysis of all Veterans with type 2 diabetes managed in the VA in 2009 (n=1,160,895). The cohort was identified based on inpatient or outpatient ICD-9 codes for diabetes or receipt of a hypoglycemic medication. We used VA Pharmacy Benefit Management data to identify all diabetes medications dispensed for the cohort in 2009, aggregated at the VA facility-level. We examined two outcomes: 1) the percentage of patients on oral hypoglycemic drugs at each VA who filled a prescription for a thiazolidinedione (TZD, i.e., rosiglitazone, pioglitazone), which are a brand-name- only expensive class of medication, and 2) the percentage of patients on insulin at each VA who filled a prescription for a long-acting analogue insulin (i.e., detemir, glargine), which are expensive long-acting insulins. We report descriptive statistics and quantify variation using the coefficient of variation (standard deviation/mean x 100). We used Pearson correlation coefficients to assess whether VA facilities with a high proportion of patients on TZDs also have a high proportion of patients on long-acting insulin analogues. We developed multivariable logistic regression models, with fixed effects for each facility, to model the odds of each outcome adjusting for patient age, gender, race/ethnicity, number of providers, and being prescribed medications by a physician (vs. non-physician).

RESULTS:
Overall, 908,721 (78.3%) of diabetics received a hypoglycemic medication, totaling 6,194,339 prescriptions in 2009. Across 129 VA facilities, the percentage of patients at each facility on TZDs ranged from 1.5% to 26.3%, with a mean of 8.3% (coefficient of variation, 54.2%). The percentage of patients on insulin who used long-acting insulin analogues ranged from 3.7% to 71.4%, with a mean of 38.4% (coefficient of variation, 40.6%). There was a weak correlation between use of TZDs and long-acting insulin analogues (r=0.28, p<.001); VA facilities with a high proportion of patients on TZDs tend to be facilities with a high proportion of patients on long-acting insulin analogues. After controlling for patient factors, the odds of receipt of TZDs at each facility ranged from 0.11 to 1.93, and the odds of receipt of an insulin analogue ranged from 0.02 to 1.27 (p<.001).

CONCLUSION: Significant practice-pattern variation exists across VA medical centers in the use of higher-cost hypoglycemic medications, despite a uniform national formulary and extensive utilization management. This substantial variation is unlikely to be explained by patient factors alone. The provider, facility, and larger regional factors that lead to this variability should be examined, because of the significant cost and efficiency implications of this variation in prescribing.
DOES HEALTH INFORMATION EXCHANGE USE DECREASE DUPLICATE IMAGING IN THE EMERGENCY EVALUATION OF BACK PAIN? Elizabeth Elliott 1; James E Bailey 2; Jim Y Wan 3; Rebecca A Pope 1; Teresa M Waters 3; Mark E Frisse 4. 1Medicine, University of Tennessee Health Science Center, Memphis, Tennessee; 2Medicine and Preventive Medicine, University of Tennessee Health Science Center, Memphis, Tennessee; 3Preventive Medicine, University of Tennessee Health Science Center, Memphis, Tennessee; 4Biomedical Informatics, Vanderbilt University, Nashville, Tennessee. (Proposal ID # 11788)

BACKGROUND: Diagnostic imaging is routinely obtained in the emergency department (ED) evaluation of back pain despite evidence-based guidelines recommending selected use. Health information exchanges (HIEs) have been proposed as a way to reduce unnecessary testing. This study sought to determine whether HIE use was associated with decreased duplicate diagnostic imaging in the evaluation of benign back pain.

METHODS: Cross-sectional analysis of data from the MidSouth e-Health Alliance (MSeHA) HIE for the 24,150 ED patient-visits for back pain by 19,136 patients seen in major general hospital EDs in the four counties of the Memphis Metropolitan Area between 8/1/07 and 7/31/09. Patient-visits were included with: 1) a prior visit with back pain principal diagnosis where any lumbosacral (LS) diagnostic imaging was obtained, and 2) a second ED visit for back pain in the study period. Patient-visits with age <18, trauma, and cancer were excluded.

RESULTS: Of the 14,927 unique patients with ED visits for back pain 26.7% (n=3980) had an index visit with LS X-ray, CT, or MRI. 478 of these 3980 patients had 800 repeat patient-visits to the ED for back pain that qualified for duplicate analysis. 179 (22.4%) of the 800 repeat back visits resulted in duplicate diagnostic imaging (X-ray 84.9%, CT 6.1%, and MRI 9.5%). HIE use in the study population was low at 12.5% and billing providers accounted for 80% of the total HIE use. Table I shows duplicate diagnostic imaging by HIE use. Bivariate analysis revealed a decrease in duplicate diagnostic imaging with any HIE use (odds ratio [OR] of 0.37, 95% confidence interval [CI] 0.18-0.69), and also a decrease in duplicate diagnostic imaging with use of HIE by the billing provider (OR 0.47, CI0.23-0.92). Multivariate results, controlling for demographic factors, comorbidity, hospital system, and previous visits, revealed similar results for decreased duplicated imaging with any HIE use (OR 0.36, CI 0.18-0.71). Interaction term HIE use previous visits was assessed but results were not statistically significant (OR 0.86, CI 0.53-1.41).

CONCLUSION: This study demonstrates that HIE use is effective in reducing duplicate diagnostic imaging for back pain. HIE use was associated with 64% lower odds of any duplicate imaging even after controlling for other factors. However, HIE benefits are limited because of low HIE usage rates. Further studies are needed to assess ways to improve HIE usage, evaluate other conditions where HIE may be efficacious, and to assess the effect of HIE use on costs of care.
Assessing the Readiness of Community Health Centers for Medical Home Certification Robin Clarke 1; Chi-hong Tseng 2; Arleen F. Brown2. 1University of California, Los Angeles, Santa Monica, California ; 2University of California at Los Angeles, Los Angeles, California . (Proposal ID # 11892)

BACKGROUND: The patient-centered medical home (PCMH) model holds great promise for reforming primary care delivery systems. The model has its roots in the Chronic Care Model, which was developed and validated in private practices among insured patients. The mostly broadly accepted definition of a PCMH is the certification tool designed by the National Committee for Quality Assurance (NCQA). While over a thousand private practices are certified as PCMHs through the NCQA, very few safety net Community Health Centers (CHCs) have applied for recognition. A recently enacted initiative by the Bureau of Primary Health Care (BPHC) seeks to extend NCQA PCMH certification to CHCs. The objective of these analyses was to assess the readiness of urban safety net CHCs for PCMH certification.

METHODS: We recruited urban safety net CHC participants from the Community Clinic Association of Los Angeles County (CCALAC). The CCALAC has 40 member clinic agencies that were eligible for inclusion in the project based on providing adult chronic-disease management services. The investigators sought volunteers to participate in the study by contacting clinic chief medical officers at their monthly meeting at the CCALAC. Medical directors and executives from each participating clinic completed a paper-based version of the NCQA medical home certification tool, the Physician Practice Connection-Patient-Centered Medical Home (PPC-PCMH). This survey evaluates a practice's delivery system on nine elements testing the processes by which a clinic identifies, tracks, and treats its patients. Using a score out of 100, NCQA does not recognize a score less than 25 as a medical home while the quartiles from 25-49, 50-74, and 75-100 gain a practice higher recognition (from level 1-3).

We performed descriptive analyses on the range of total scores and distribution of scores on the nine individual elements of the PPC-PCMH. These findings represent initial results from the first 18 clinics participating in the study.

RESULTS: The chart displays the distribution of scores for the 18 clinic agencies, which represent 81 individual clinic sites that provided 460,000 patient visits in 2009. The mean score from the participating clinics was 66.3 (standard deviation 15.2; range 33.3-90). All clinics would gain recognition from the NCQA at some level as medical homes - three at level one, seven at level two, and eight at level three. The safety net CHCs attained the highest mean scores in the following NCQA PCMH elements: care management (13.4 of possible 21), patient tracking/registry function (15.6 of possible 21), and performance reporting and improvement (12.0 of possible 15). The lowest mean scores were on electronic prescribing (2.6 of possible 8) and advanced electronic communication (0.3 of possible 4). The five clinics (numbers 1, 3, 16, 17, 18) with an electronic medical record all attained level three recognition; NCQA score and EMR presence were correlated with a Pearson coefficient of r=0.68.

CONCLUSION: These data indicate that the participating urban safety net clinics are well positioned for PCMH certification: Indeed, the majority of them would obtain the two highest levels of recognition. The findings of strong performances in coordinating care and performance reporting reflect the effective processes of the community health center model. The results are more striking because the majority of these clinics plan to implement an EMR system in 2011, which should bolster their low-scoring performances on the electronic elements.

Our findings raise several reasons that the NCQA tool may not be the best mechanism for evaluating CHCs as medical homes. Because of their initial strong performance, these CHCs may have little incentive or room for improvement on the NCQA tool. The grouping of scores in the upper range with the mean greater than one standard deviation above 50 weakens the precision of the tool to distinguish variation in quality amongst CHCs. The high correlation of 0.68 indicates the importance of an EMR to the current scoring format and reinforces previous criticism that the PPC-PCMH focuses too heavily on technological processes.

The findings from this initial phase of the study demonstrate the need to investigate how the NCQA's PPC-PCMH tool applies to CHCs. This is especially important in light of the BPHC's certification initiative and the health reform act's expectation that CHC capacity will increase significantly to care for millions of newly insured patients. After extending participation to all eligible clinics within the CCALAC, the next phase of the study is to investigate whether the NCQA total score is associated with patient care outcomes and whether particular PPC-PCMH elements differentially influence quality of care. Future studies should investigate whether there are other services or processes that more accurately predict the quality of care provided by CHCs.
Blood Pressure Lowering Among ‘Resistant’ Hypertensive Diabetes Patients in Two High-Performing Health Systems: The Adherence and Intensification of Medication (AIM) Cluster Randomized Controlled Effectiveness Trial

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BACKGROUND: Even in high-performing health systems where programs have been established to improve blood pressure (BP) levels and BP control levels are approaching or exceeding 80%, some hypertensive patients with diabetes continue to have poor BP control. Poor medication adherence or provider failure to intensify medications (clinical inertia) contribute to poor control in this 'resistant' population. Yet, current programs are rarely designed to reach out to and address the problems of this population. We designed and tested the Adherence and Intensification of Medication (AIM) program to improve BP control among resistant patients in 2 high performing healthcare systems.

METHODS: The AIM study was a prospective, cluster-randomized effectiveness trial in which 16 primary care teams consisting of 5-28 PCPs, their staff, and diabetes patients, within 3 Veterans Affairs (VA) and 2 Kaiser Permanente facilities, were randomized to either the AIM intervention or to usual care. We collected data during a 14-month intervention period. Among intervention teams, clinical pharmacists trained in motivational interviewing were supported by clinical information systems that enabled proactive identification of and outreach to eligible patients identified on the basis of persistent poor BP control and either medication refill gaps or lack of recent medication intensification. The pharmacists then provided adherence counseling, titration of medications, or both to participating patients. No maintenance support was provided after participants completed the intervention. The primary outcome was the relative change in systolic blood pressure (SBP) measurements between eligible intervention team compared with eligible control team patients. We examined longitudinal differences in differences between SBP among eligible participants immediately after receiving the intervention and up to six months after the end of the intervention period.

RESULTS: 2303 diabetes patients on the control teams and 1797 patients on the intervention teams were eligible because they had persistent poor BP control and either medication refill gaps or no recent intensification. We compared changes in SBP among all the potentially eligible patients on the control teams and intervention teams, although only 53% of the 1797 eligible intervention patients received the AIM intervention (24% declined, 12% could not be reached). Mean SBP of intervention team patients one month prior to the intervention was 151 mm Hg compared to 150 in control teams (p=.33) Changes in mean SBP after intervention team participants received the intervention were -4.4 mm Hg compared with -1.9 among eligible control team patients (P<.001). By six months after the intervention period, mean SBP was approximately 145 mm Hg among both intervention and control team patients.

CONCLUSION: The AIM program more rapidly lowered BPs among "resistant" hypertensive patients - those with adherence problems or who lacked recent intensification-than usual care. However, this difference did not persist over time, partly because patients on control teams also attained better BP control, albeit more slowly. In high-performing healthcare systems that have successfully brought the majority of patients under control, the AIM program can further enhance BP control among resistant patients but will require greater penetration and maintenance to spread and sustain the improved BP effect.
Factors associated with adherence to physicians recommendations in a prospective cohort after hospitalization with heart failure Howard S Gordon 1; Richard Street 2; Anita Deswal3. 1VAMC and University of Illinois at Chicago, Chicago, Illinois ; 2Texas A&M University, College Station, Texas ; 3Houston VAMC and Baylor College of Medicine, Houston, Texas . (Proposal ID # 12509)

BACKGROUND: The contribution of physician-patient communication in adherence to physicians' recommendations in patients with heart failure is poorly studied.

METHODS: In a prospective observational cohort study of patients hospitalized for an exacerbation of heart failure at 2 large VA Medical Centers, we examined the association of demographic factors, clinical factors and physician-patient communication (ratings and behaviors) with adherence for 210 patients who had scheduled outpatient visits with 93 physicians in the 6 months post-hospital follow-up period. Patients with dementia and terminal illness were excluded. Patients completed questionnaires to collect demographics, functional status, trust, and ratings of communication. Clinical data were abstracted from medical records. Communication behaviors were collected and coded from audio-recordings of the physician-patient visits. Adherence questionnaires were administered by telephone 3–4 weeks after the outpatient visits. Analyses comparing adherence with potential covariates used the chi-square test or t-test as appropriate. Mixed multiple linear regression with a repeated measures design was used to examine the independent relationship of communication and potential co-variates with adherence.

RESULTS: Adherence was not statistically different by race, ethnicity, marital status, education, income, employment status, ejection fraction, history of myocardial infarction or diabetes, P > 0.10; but adherence was higher for patients at increased age, P = 0.04, higher functional status, P = 0.001 and was higher (P<.01) for patients reporting higher trust in physician, higher self-efficacy to communicate, and who rated the physician as more informative and more supportive. Adherence was higher for patients whose physicians more frequently used partnering and supportive communication behaviors (P=.02, and P=.001), but not with the overall provision of information (P=.65). Using mixed multiple linear regression to examine the independent association of adherence with communication and potential covariates, demographic and clinical factors were not associated with adherence, but higher patients' rating of the doctor as informative and the doctors more frequent use of supportive communication behaviors were significant predictors of better adherence (P=.04, and P=0.01).

CONCLUSION: In this cohort of heart failure patients, adherence was associated with age, functional status, trust, and both patients' ratings and observers' coding of physicians' communication behaviors. In multiple regression analyses, physicians' supportive communication behavior and the patients' rating of the physician as informative were associated with adherence. Fortunately communication is a skill that can be taught. Future research should evaluate whether training physicians to improve communication can lead to improved adherence.