Quality of Osteoporosis Care Among Older Medicare Fragility Fracture Patients 2006-2010

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Background: Osteoporotic fractures result in substantial morbidity and mortality; fracture risk is highest among fragility fracture survivors. Appropriate osteoporosis treatment reduces recurrent fractures. We studied osteoporosis care in a national cohort of older, community dwelling Medicare fragility fracture survivors to assess the uptake of care guidelines and post-fracture care quality among U.S. adults.

Methods: Using Medicare administrative inpatient, outpatient (2003-2010) and prescription data (2006-2010), we studied patients 68 years of age or older with a fracture of the hip, distal radius or proximal humerus. Poisson regression modeled factors, including patient characteristics, co-morbidities and hospital referral region (HRR) of residence, were associated with our main outcome: bone density testing and/or anti-resorptive pharmacotherapy in the 6 months following fracture. In secondary analyses, these models were repeated for patients without osteoporosis care prior to index fracture (“attention naïve”), for women only, by fracture location and allowing 12 months to achieve the outcome.

Results: Among 61,832 fracture patients (37.3% hip, 19.9% humerus, 42.9% radius), mean age was 80.6; 87.0% were female; 88.5% were white; 2.6% were Black; 62.1% were “attention naïve” at the time of fracture. Overall 21.8% received testing and/or pharmacotherapy in the 6 months following fracture. In adjusted models, factors associated with significantly lower likelihood of receiving this care were: Black race, male sex, and an upper extremity fracture (vs. hip). In models restricted to “attention naïve” patients the same factors were associated with lower RRs of achieving care. Adjusted HRR-level care rates ranged from 14.7%-22.9%. The proportion receiving care increased from 2006 to 2009 (16.8% vs. 30.5%).

Secondary analyses paralleled the main models. Overall, the proportion achieving the main outcome within 12 months of index fracture was only slightly higher: 28.4%.

Conclusions: In this national cohort, post-fracture osteoporosis care was uncommon, especially for Blacks and men. Osteoporosis care increased over time, but for most patients without prior osteoporosis attention, a fragility fracture was insufficient to trigger treatment and/or testing in this fully-insured cohort. Clinicians and policy makers must consider effective remedies for this persistent care gap.
Associations between processes of care and mortality in a national cohort of elderly patients hospitalized for pneumonia

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Background: While often used as proxies for healthcare quality, it is not clear whether processes of care are associated with improved survival for patients with community-acquired pneumonia (CAP). Our aim was to assess independent associations between publicly reported processes of care and short-term mortality for elderly patients hospitalized for CAP.

Methods: We studied elderly patients (age ≥ 65) hospitalized for CAP in U.S hospitals participating in the CMS Inpatient Quality Reporting program from 2006 to 2010, who met eligibility criteria for the CMS inpatient pneumonia process measures. We linked patient-level performance rates for these 7 publicly reported process measures (i.e., timely and appropriate antibiotics, blood cultures in the ED and for ICU patients, smoking cessation counseling, and pneumococcal and influenza vaccination) to 30 -day all-cause mortality using Medicare administrative data. We used multivariable logistic regression to assess independent associations between all individual and an all-or-none composite measure of processes of care and mortality for each study year, controlling for baseline patient and hospital characteristics.

Results: From 2006 to 2010, 1,818,979 elderly patients with CAP were admitted to 4,740 unique hospitals (range 326,956 to 399,243 patients per year). Overall mortality was 10.4%, ranging from 9.2 to 11.4% per year. Absolute mortality was significantly lower for each study year for patients who received (versus did not receive) appropriate antibiotics (difference -3.7 to -5.9% per year), blood cultures in the ED (difference -0.7 to -1.2% per year), smoking cessation counseling (difference -2.3 to -3.2% per year), pneumococcal vaccination (difference -0.9 to -1.6% per year), and influenza vaccination (difference -1.4 to -2.0% per year) [p<0.05 for each measure, each year]. As shown in the Table, adjusted odds ratios demonstrated similarly significant reductions in mortality each year for these processes of care with the exception of blood cultures in the ED, which was only associated with reduced mortality in 4 study years. While absolute unadjusted mortality was 1 to 3.1% higher for patients who received all processes for which they were eligible, adjusted odds ratios demonstrated decreased mortality for this all-or-none composite measure.

Conclusions: Appropriate antibiotic therapy and 3 preventive measures (smoking cessation counseling, and pneumococcal and influenza vaccination) were consistently associated with improved short-term survival in this large national cohort of elderly patients hospitalized for pneumonia. While these findings support the ongoing use of these process measures in public reporting and pay-for-performance programs, they also suggest removal of measures such as timely antibiotic initiation that are not consistently associated with improved patient survival.
Visit Based EHR Reminders Improve the Quality of Outpatient Care

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Background: Current electronic health records (EHRs) are efficient in collecting and storing enormous amounts of patient data; yet, standard build EHRs often provide little or no intelligent decision support to facilitate evidence-based care. We developed and implemented a suite of just-in-time, visit-based, EHR-enabled Best Practice Alerts (BPAs) with exception reporting for 3 chronic diseases and 5 preventative services in 3 academic general medicine practices using the Epic EHR. We assessed the impact of the EHR-based decision support and exception reporting intervention on national quality indicators.

Methods: We assessed pre-post performance differences on 13 quality indicators for diabetes (DM), heart disease (HD), and heart failure (HF) and 5 preventative services in the 12 months before and after implementation of the BPAs. Time series linear regression was used to adjust for autoregressive errors and secular trends. Rates of change (% per year) in performance in the pre- and post-intervention periods are reported. Quality measures were satisfied if the recommended care occurred or if an appropriate exception was documented using the BPAs: did not have the disease (e.g. h/o gestational diabetes, not diabetes), not done for medical (contraindications) or patient (refusal) reasons, or done outside of our health system with results not automatically available. Our study sample included all established patients with at least 1 office visit in the past 12 months. The study period included a baseline data period from June 2010 to June 2011 and a post-BPA intervention period from July 2011 to June 2012.

Results: Eligible patients completed 23,437 visits in the pre- and 25,615 visits in the post-intervention period, triggering 33,194 BPAs in the post-intervention period. For the 18 quality indicators, we saw statistically significant improvements in rates per year for 13 indicators (p<0.05) and a trend towards improvement in another 2 (p<0.06) after adjusting for secular trends. All 5 preventative services had significant improvements: mammography rates improved 9.9%, colorectal cancer screening 4.5%, cervical cancer screening 7.2%, osteoporosis screening 7.3%, and pneumonia vaccination 7.4%. For chronic disease metrics, we found significant improvements in lab monitoring (DM LDL: 5.7%, HD LDL: 4.1%), medication use (HD beta blocker: 11.4%, HD ACEI/ARBs: 2%, HF anticoagulants: 5.3%, HF ACEI/ARB 2.5%, HF beta blocker: 6.2%), and outcomes (DM A1C <8%: 3.2%, DM LDL <100: 2.7%, HD LDL <100: 2.6%). No improvements were seen for DM A1C monitoring or nephropathy screening. As a comparison, we did not create BPAs for BP monitoring or control for DM or HD. We found no change in BP measurement in either DM or HD; BP control worsened significantly (-4.3%, p<0.05) for DM and improved significantly (3.5%, p<0.05) for HD which had 2 reminder BPAs for beta blocker and ACEI/ARB medication usage. Exception reporting had the biggest impact for preventive services that were done outside of our health system.

Conclusions: Our suite of visit-based, EHR-enabled BPAs with exception reporting achieved significant but modest improvements in delivery of all of the preventive service and most of the chronic disease metrics we targeted even after adjusting for secular trends. Further improvements in outpatient quality will likely require more intensive case- and population management, audit and feedback, and/or other incentives.
Making the EHR Smarter: Patient and Provider Reported Data Improve Performance on Preventative Health Quality Measures

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Background: Although Electronic Health Records (EHRs) facilitate data collection and management, the ability to capture services delivered in other health systems and patient-centered information is limited. The frequency of such occurrences and impact on performance metrics is unknown. We describe the frequency of provider-reported exceptions to preventative health best practice alerts (BPAs) and examine the impact of patient-centered data exceptions on performance metrics.

Methods: We implemented 5 visit-based BPAs in our Epic EHR targeting preventative health metrics in 3 general medicine clinics between July 2011 and June 2012. BPAs included: mammography (MAM), colorectal cancer (CRC), cervical cancer (CERV), and osteoporosis (OP) screening, and pneumonia vaccine (PNA). BPAs allowed providers to report patient preferences and medical contraindications to BPAs. BPAs satisfied outside the health system were documented in the BPA or the health maintenance section of the EHR. The study sample included established patients eligible for age-appropriate preventative services with at least one primary care visit in the past year. Baseline performance was calculated as the proportion of eligible patients satisfying measures based on EHR data. Post-BPA measurements were calculated using 3 approaches: 1) Standard: EHR data/measure eligible; 2) Exception: (EHR data+completed elsewhere)/(measure eligible-patient reason-medical reason); 3) Patient-centered: in this approach, patient refusals or medical contraindications counted towards measure completion rates. (EHR data+completed elsewhere+patient reason+medical reason)/measure eligible. Performance before and after BPA implementation was examined for each approach using a chi-square analysis with bonferroni adjustment. A cross-sectional comparison of post-BPA performance between the 3 approaches was also done.

Results: Between July 2011 and June 2012, 23805 encounters were completed by 9780 patients who were eligible for at least one health maintenance measure. A total of 21757 alerts fired. Baseline performance rates were as follows: MAM 71%, CRC 67%, CERV 53%, OP 72%, and PNA 67%. For each metric, between 2-9% of patients had services completed elsewhere and between 0.7-2.4% of BPAs were not completed for patient reasons such as patient refusal or medical reasons such as limited life expectancy. In the standard approach, significant improvement from baseline was observed after BPA implementation for CRC (74%), PNA (73%), and OP (72%); (p<0.05 for all). Mammography and cervical cancer screening rates did not change. In the exception approach, all measures improved significantly from baseline: MAM 75%, CRC 84%, CERV 62%, OP 80%, and PNA 82% (p<0.05 for all). Similar improvements from baseline were noted with the patient-centered approach: MAM 76%, CRC 84%, CERV 63%, OP 80%, PNA 81% (p<0.05 for all). While no difference in post-BPA performance between the exception and patient-centered approaches was observed in cross-sectional analysis, performance rates in the exception (p<0.05 for all measures) and patient-centered approaches (p<0.05 for all measures) were significantly higher than the standard approach.

Conclusions: Inclusion of patient and provider-reported data improved performance on preventative health metrics. Service completion in outside systems is common, and failure to account for outside data may underestimate performance.
Does the Meaningful Use of Electronic Health Records Improve Chronic Care Above Standard QI Intervention?

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Background: Care for chronic illness accounts for over 60% of healthcare spending. Through the Health Information Technology for Economic and Clinical Health Act, 677 million dollars have been allocated to Regional Extension Centers (REC) to help primary care providers adopt electronic health records and achieve Stage 1 Meaningful Use (MU) functionality as defined by CMS. In this report, we consider the question, “Does adding Meaningful Use to quality improvement (QI) interventions achieve better chronic care results in disparate, independent primary care practices?”

Methods: Through the Robert Wood Johnson funded Improving Performance in Practice Program (IPIP), rapid cycle QI techniques for chronic care improvement were disseminated to 180 North Carolina primary care practices by the end of 2009. The North Carolina Area Health Education Centers Program (AHEC) served as the organizational home for these efforts. Later, AHEC was also designated then funded as the REC for the state of North Carolina beginning February of 2010. Participating IPIP practices report diabetes population measures monthly to the AHEC database. Here, we report the results for practices that have reported these data for at least the last 6 months who have signed up for the REC. These practices are divided into 3 groups: Group 1 consists of practices that do not yet have automated quality reporting; Group 2 practices have instituted electronic prescribing + automated quality reporting; Group 3 practices have fully achieved Stage 1 Meaningful Use.

Results: Participating practices average 3.8 providers per practice and 44% were rural. Baseline percentages for population control (pre-IPIP) of diabetic care measures were 24% for HGB A1c < 7, 24% for HGB A1c>9, and 38% for LDL-C < 100. As of December of 2012, 21 practices were in Group 1. In these practices, HGB A1c < 7 improved to 40.6% while 23% of patients still had HGB A1c>9. For Group 1 patients, LDL-C<100 remained at 38%. Group 2 consisted of 26 practices covering 12,126 diabetics. Eleven practices covering 7,417 diabetics achieved full meaningful use and met Group 3 criteria. Diabetes chronic care results are shown in the Table.

Conclusions: Early data show that achievement of Stage 1 Meaningful Use through the REC program is associated with substantial gains in diabetes care measures in small, independent primary care practices who also engage in QI. These improvements are greater than those obtained through automated quality reporting alone and may be attributable to the organizational and workflow changes necessary to implement all facets of MU.