Impact of Public Reporting of Hospital Readmission Rates on Emergency Department Admission Decisions

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Background: Beginning in July 2009, the Centers for Medicare and Medicaid Services began publicly reporting risk-standardized 30-day hospital readmission rates. Since approximately half of hospitalized patients are admitted through the emergency department (ED), hospitals may have responded to this policy in part by focusing their efforts to reduce readmissions on admission decisions in the ED. Our objective was to determine if public reporting of hospital readmission rates led to: 1) a decrease in the likelihood of admission to the hospital for patients seen in the ED following a recent hospitalization; or 2) an increase in the likelihood of admission to an observation unit for these patients.

Methods: We performed a difference-in-differences analysis comparing the likelihood of admission to the hospital or to an observation unit for patients who presented to the ED within 7 days of a prior hospitalization versus patients who did not have a prior hospitalization within 7 days, before and after the implementation of public reporting of hospital readmission rates. We used data from 4 years before public reporting and 2 years after from the National Hospital Ambulatory Medical Care Survey, an annual, nationally representative survey of ED visits. We implemented our difference-in-differences model using logistic regression, controlling for patient demographic characteristics, clinical acuity, ED visit diagnosis, and secular trends in the outcomes for patients with and without a prior hospitalization.

Results: We analyzed 97,991 ED visits by patients aged 18 or older, 4,106 of which were by patients who had a prior hospitalization within 7 days and 93,885 by patients who did not. For patients presenting to the emergency department within 7 days of a prior hospitalization, 34% were admitted to the hospital and 3.4% were admitted to an observation unit during the period prior to implementation of public reporting of readmission rates, versus 32% and 2.7%, respectively, for the period after. For patients without a recent hospitalization, 15% were admitted to the hospital and 1.7% were admitted to an observation unit prior to public reporting, versus 16% and 2.5%, respectively, after. Difference-in-differences estimates indicate that the changes in admissions to the hospital and to an observation unit for patients with a recent hospitalization compared to those without were not significant (admission to hospital: -0.5 percentage points, 95% CI: -7.8, 6.9; admission to observation unit: -0.9 percentage points, 95% CI: -3.1, 1.3). Results did not differ when the study sample was limited to patients with Medicare.

Conclusions: In the 2 years following its implementation, public reporting of hospital readmission rates did not lead to a change in admission decisions for patients who presented to the ED within 7 days of a prior hospitalization. National policies to reduce readmission rates that extend beyond public reporting—such as financial penalties—may lead hospitals to change processes of care in the ED. Evaluations of the impact of these policies should include an assessment of ED admission decisions.
The Association Between Outpatient Experience of Care and Subsequent Resource Utilization in a Primary Care Network

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Background: Assessing patient experience, using surveys such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS), is increasingly part of performance measurement efforts. The relationship between patient reported access to care and subsequent resource utilization has not been extensively studied. Our goal was to examine the relationship between patient reported access to care, using the Clinician and Group (CG) CAHPS survey, and measures of resource utilization within a large, academic primary care network.

Methods: Subjects included adult patients seen in any of 13 primary care practices affiliated with Massachusetts General Hospital who completed a CG-CAHPS survey after an outpatient visit between January, 2009 and December, 2010. CG-CAHPS individual item measures were assessed within the access domain (5 items) by taking the percentage of respondents reporting the most positive response (‘Always’) for the question item, commonly referred to as the ‘Top Box’ score. Resource utilization measures were assessed through December 2011 and included high cost imaging tests (computed tomography, magnetic resonance imaging, and nuclear cardiology), emergency department (ED) visits, and inpatient admissions or readmissions. We examined the association among CG-CAHPS items and subsequent resource utilization outcome measures using generalized linear models. We assessed adjusted outcomes controlling for age, gender, race, insurance status, language spoken and Charlson score.

Results: The study population included 13,945 adult patients who completed a CG-CAHPS survey and had data available for at least one utilization measure. Among these patients, 1375 (9.9%) had a high cost imaging test, 1312 (9.4%) had a visit to the ED, 1095 (7.9%) had an inpatient admission, and 196 (1.4%) had a readmission within 30 days. After adjusting for patient characteristics, three items within the access composite were significantly associated with resource utilization outcome measures. Patients who reported getting an urgent care appointment as soon as they needed it were less likely to have had a high cost imaging test completed (RR, 0.82; 95% CI, 0.71-0.94; P = .006) and were less likely to have an ED visit (RR, 0.87; 95% CI, 0.75-1.00; P = .06). Patients who reported getting a routine care appointment as soon as they needed it were less likely to have had a readmission (RR, 0.65; 95% CI, 0.47-0.91; P = .01). Patients who reported getting an answer to their medical question after regular office hours were less likely to have had a high cost imaging test completed (RR, 0.68; 95% CI, 0.49-0.92; P = 0.01).

Conclusions: Within a large, academic primary care network, higher patient-reported access to care after outpatient visits was associated with decreased subsequent high cost imaging tests, ED visits and hospital readmissions. Whether improved access to outpatient primary care services decreases overall health care utilization and costs requires further study.
Association of hospital volume with risk-standardized readmission rates

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Background: A large literature has demonstrated a positive association of hospital or operator volume with patient outcomes. Large volume centers produce fewer complications and deaths following surgical procedures, and fewer deaths from major medical conditions. Whether there is a similar relationship for readmissions is uncertain.

Methods: We identified all hospitalized patients over 65 with Medicare fee for service who were discharged alive, not against medical advice, and not transferred out in 2010. We excluded patients admitted for medical treatment of cancer or primary psychiatric disease. We used the National Quality Forum-endorsed hospital-wide readmission measure to calculate overall risk-standardized readmission rates (RSRRs) for all hospitals, adjusting for age, principal diagnosis and comorbidity. We also calculated specialty cohort-specific standardized readmission ratios (SRRs) for five mutually exclusive cohorts within each hospital: surgery/gynecology, cardiorespiratory, cardiovascular, neurology and medicine. An SRR of 1 indicates the hospital is at expected readmission rate; SRR>1 indicates having greater than expected readmission rate. We divided hospitals into strata based on yearly volume of index admissions and compared RSRRs or SRRs for each strata, omitting hospitals with fewer than 25 cases.

Results: We studied 7,678,216 discharges from 4,821 hospitals. Overall, higher volume hospitals had higher RSRRs. The mean RSRR for hospitals in the lowest quartile of index admissions (N=1,073, median 127 admissions) was 16.12, compared to 16.34 for those in the highest decile (N=482, median 5,782 admissions). A total of 39.0% of hospitals in the lowest quartile of admissions had SRR>1, compared to 50.6% of hospitals in the highest decile. Within specialty cohorts, this association held for cardiorespiratory, neurology and medicine patients. However, the surgery/gynecology cohort showed no association and the cardiovascular cohort an inverse relationship. The largest difference between volume strata in specialty cohorts was in the cardiorespiratory cohort (mean SRR 0.99 for hospitals in the lowest half [N=1,185] vs 1.02 for top decile [N=200]). In the cardiorespiratory cohort, 39.5% of hospitals in lowest half of admissions had SRR>1, compared to 57.1% of hospitals in highest decile of annual volume. By contrast, in the cardiovascular cohort, the mean SRR for hospitals in the lowest half of admissions but with at least 25 cases (N=943) was 1.00 compared to 0.98 for those in top decile (N=456). In this cohort, 51.5% of hospitals in bottom half of volume had SRR>1 compared to 43.4% of those in top decile.

Conclusions: In contrast to findings for other outcomes, higher hospital volume is associated with slightly worse overall risk-adjusted readmission rates. This relationship is modest and not consistent across all specialty cohorts. The care processes that lead to high quality transitional care may be more difficult to achieve in high volume institutions.
Predictors of potential blood pressure overtreatment in older veterans with diabetes

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Background: We have previously shown that an 80-year-old veteran with diabetes is three times more likely than a 55-year-old veteran to receive potential overtreatment for hypertension. However, we know little about how geriatric-specific co-morbidities and patterns of health care use are associated with overtreatment in older veterans with diabetes.

Methods: We identified 280,396 veterans age 75+ with diabetes receiving ambulatory care in the Department of Veterans Affairs (VA) over 2 years (8 quarters, July 2009-June 2011) using VA National Central Data Warehouse data. For the last visit of each quarter, we indexed low blood pressure (BP) visits with BP <130/65 mmHg. To measure the degree of potential overtreatment, for each veteran, we used anti-hypertension medication data to count the number of low-BP visits during which the veteran was also prescribed >=3 classes of BP medications continuously OR had BP regimen intensification within 3 months of the low-BP visit (a count of 8 possible opportunities per veteran). We then examined, using zero-inflated binomial regression, how specific comorbidity and utilization variables were associated with degree of potential overtreatment. Variables were age (in years, range 75-100), count of 21 general medical conditions (e.g., heart disease), count of 8 geriatric conditions (e.g., dementia), ambulatory care use (total specialty and primary care visits), and the intensity of geriatric care utilization (4 categories: general medicine with/without one geriatric consultation visit, geriatric primary care [2+ geriatric clinic visits comprising >50% of primary care visits], or other combination of geriatric and general primary care visits). We adjusted for time exposure. On a subset of 7,227 of the older veterans who received any new geriatric care (consultation or onset of new primary care) during the 2-year time period, we performed a longitudinal analysis to measure the time relationship between potential overtreatment and onset of new geriatric care.

Results: Nearly one-third (31%) of the older veterans had a low-BP visit associated with potential overtreatment. Multivariable regression results (Table) showed that each additional year above age 75, both types of co-morbidity, and utilization all predicted greater potential overtreatment (p<.001 for all variables). The only protective factor was intensity of geriatric care involvement. Veterans with geriatricians as primary care providers had the least potential overtreatment compared to those with no geriatric care (.44 versus .54 visits with potential overtreatment, on average). All variables were strongly statistically significant (p<.001). In the longitudinal analysis, overtreatment risk was increased in the 3 quarters leading up to new geriatric care and decreased in the 3 quarters after new geriatric care.

Conclusions: Increased age, greater healthcare use, and co-morbidity all contribute to overtreatment. Short-term protection from overtreatment following geriatric clinic care suggests strategies employed by geriatricians may be useful in preventing potential overtreatment of older diabetic patients.
Overuse, Underuse, and Misuse of Colorectal Cancer Screening Tests

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Background: The recent rise in the use of colorectal cancer (CRC) screening exams has led to concerns regarding the efficiency of population-based screening programs. We assessed underuse, overuse, and misuse of CRC screening and surveillance exams among an average-risk adult population.

Methods: We studied 2,653 adults age 50-65 with no personal history of CRC who initiated screening in 2001 in a large multispecialty group practice. We used electronic health record data to identify all CRC screening exams (home fecal occult blood testing [FOBT], flexible sigmoidoscopy [FS], and colonoscopy) between 2001 and 2011, and reviewed pathology reports of all colon biopsies. We used 2008 screening guidelines and 2006 surveillance guidelines from the US Multi-Society Task Force to classify use. We defined UNDERUSE as any exam performed > 1 year after recommended intervals and OVERUSE as any endoscopy exam performed > 1 year before recommended intervals. We did not measure OVERUSE of FOBT exams given the short (1 year) interval. MISUSE included FOBT or FS exams performed following the removal of colorectal adenomas or FOBT performed within 10 years of a normal colonoscopy. We excluded 15 (0.5%) patients diagnosed with CRC during the study period. We used Kaplan-Meier methods to calculate the time to follow-up exam by initial findings (no polyps; hyperplastic polyps; 1-2 small adenomas [<10mm]; or adenomas with high risk features [3+ adenomas/large adenoma >10mm/ high-grade dysplasia/ villous adenoma]).

Results: Most patients were women (53%), white (80%), and commercially insured (81%). Baseline screening exams in 2001 included 1,812 FOBT exams (69%), 377 FS exams (14%), and 449 colonoscopies (17%). Subjects continued receiving primary care in the multispecialty practice for a median of 10 years (interquartile range [IQR] 6-10 years) following the baseline exam; during which time an additional 5,184 screening and surveillance exams (2,318 FOBT exams [45%], 506 FS exams [10%], and 2,360 colonoscopies [46%]) were completed by 224 primary care providers and 26 endoscopists. 2% of FOBT exams were positive; while 11% of endoscopic exams identified 1-2 small adenomas and 6% of exams identified adenomas with high risk features. Among follow up FOBT exams, 338 (15%) represented UNDERUSE and 674 (29%) represented MISUSE. Among FS exams, 1 (0.2%) represented UNDERUSE, 7 (1%) represented OVERUSE, and 6 (1%) represented MISUSE. Among colonoscopies, 414 (18%) represented UNDERUSE and 921 (39%) represented OVERUSE. The median time to next screening after negative FOBT was 1.3 years (IQR 1.0-2.4 years) and after FS was 5.5 years (IQR 4.5-9.4 years). The median time to next colonoscopy varied based on the previous exam findings (log-rank p<0.001), including previous exams with no polyps (6.4 yrs, IQR 5.0-9.0 years), hyperplastic polyps (5.6 years, IQR 4.8-8.9 years), 1-2 small adenomas (5.0 years, IQR 3.3-6.3 years), and adenomas with high risk features (3.0 years, IQR 2.3-4.0 years).

Conclusions: We identified substantial inefficiencies, with over one-third of colonoscopies performed too early and one third of FOBTs performed either late or inappropriately. These use patterns may reduce the tests’ effectiveness, subject patients to unnecessary risks, and increase healthcare costs. Healthcare providers developing tools to increase CRC screening rates should address the simultaneous potential for underuse, overuse, and misuse.
Comparison of the Quality of Patient Referrals from Physicians, Physician Assistants, and Nurse Practitioners to an Academic General Internal Medicine Practice

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Background: Physician Assistants (PAs) and Nurse Practitioners (NPs) are increasingly utilized to improve healthcare access. There has been limited research on the abilities of PAs and NPs to care for complex medical patients and we are unaware of any studies examining the quality of patient referrals from PAs and NPs to academic medical centers. Our objectives were to compare referrals to the Mayo Clinic Rochester General Internal Medicine (GIM) regional practice from physicians, PAs and NPs regarding: 1) quality of patient management and referrals based on a validated measure, 2) patient complexity determined by the Charlson Index and 3) treatment costs during the first 30 days after the referral visit.

Methods: We conducted a retrospective comparison study of all 160 patients of NPs and PAs, and a random sample of 160 patients of physicians, who were referred to the GIM regional practice from 2009 to 2011. Eight physicians, each with over 10 years practice experience and blinded to the identities of referral sources and patients, used a seven-item instrument with five-point scales (1=strongly disagree; 5=strongly agree) to assess the appropriate management and referral of patients. Internal consistency and interrater reliability were determined using Cronbach alpha and intraclass correlation coefficient (ICC) respectively. Factor analysis with an adjusted correlational matrix to account for non-independent data was used to ascertain the dimensionality of item scores. Differences between item scores for patients referred by physicians, versus PAs and NPs combined, were verified using multivariate ordinal logistical regression, adjusted for patient age, gender, referral distance and Charlson Index. Differences between groups for Charlson Indices and total costs were determined using ANOVA. The sample size of 160 patients per group provided 80% power to detect a small-to-moderate Cohen’s effect size of 0.32. Two-tailed statistical significance was set at alpha=0.05.

Results: Factor analysis revealed a one-dimensional measure of the quality of patient referrals by physicians, PAs and NPs. Interrater reliability (ICC) for all individual items (range 0.77 to 0.93) and overall (0.92), and internal consistency for all items combined (Cronbach alpha = 0.75), were very good. Physicians scored significantly higher (% agree/strongly agree) than PAs and NPs for each of the following instrument items: referral question clearly articulated (86.3 vs 76.0; p=.0007), clinical information provided (72.6 vs 54.1; p=.0033), documented understanding of the patient’s pathophysiology (51.0 vs 30.3; p<.0001), appropriate evaluation performed locally (60.3 vs 39.0; p<.0001), appropriate management performed locally (53.5 vs 24.1; p<.0001), referral was unnecessary (30.1 vs 56.2; p<.0001), and confidence returning patient to referring provider (67.8 vs 41.4; p<.0001). There were no significant differences between groups regarding patient complexity or costs of outpatient treatment, hospitalization, laboratory testing or consultations.

Conclusions: This is the first study to demonstrate that the quality of referrals to an academic medical center, as determined by a panel of experienced and blinded internal medicine faculty members, is significantly higher for physicians as opposed to PAs and NPs with respect to several characteristics including clarity of the referral question, understanding of pathophysiology, and adequate pre-referral evaluation and documentation.