

Patient cost-sharing and insurance arrangements are associated with hospital readmissions after abdominal surgery: Implications for access and quality health care

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Background. Readmission rates after operative procedures are used increasingly as a measure of hospital care quality. Patient access to care may influence readmission rates. The objective of this study was to determine the relationship between patient cost-sharing, insurance arrangements, and the risk of postoperative readmissions.

Methods. Using the MarketScan Research Database (n = 121,002), we examined privately insured, nonelderly patients who underwent abdominal surgery in 2010. The main outcome measures were risk-adjusted unplanned readmissions within 7 days and 30 days of discharge. Odds of readmissions were compared with multivariable logistic regression models.

Results. In adjusted models, \$1,284 increase in patient out-of-pocket payments during index admission (a difference of one standard deviation) was associated with 19% decrease in the odds of 7-day readmission (odds ratio [OR] 0.81, 95% confidence interval [CI] 0.78–0.85) and 17% decrease in the odds of 30-day readmission (OR 0.83, 95% CI 0.81–0.86). Patients in the noncapitated point-of-service plans (OR 1.19, 95% CI 1.07–1.33), preferred provider organization plans (OR 1.11, 95% CI 1.03–1.19), and high-deductible plans (OR 1.12, 95% CI 1.00–1.26) were more likely to be readmitted within 30 days compared with patients in the capitated health maintenance organization and point-of-service plans.

Conclusion. Among privately insured, nonelderly patients, increased patient cost-sharing was associated with lower odds of 7-day and 30-day readmission after abdominal surgery. Insurance arrangements also were significantly associated with postoperative readmissions. Patient cost sharing and insurance arrangements need consideration in the provision of equitable access for quality care. (Surgery 2016;159:919-29.)

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THE HOSPITAL READMISSIONS REDUCTION PROGRAM, established by the Patient Protection and Affordable Care Act, penalizes hospitals with greater-than-

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expected unplanned readmission rates among Medicare patients with acute myocardial infarction, congestive heart failure, pneumonia, chronic obstructive pulmonary disease, total hip arthroplasty, and total knee arthroplasty. The Centers for Medicare and Medicaid Services (CMS) plan to expand applicable conditions of the Hospital Readmissions Reduction Program to coronary artery bypass graft surgery.¹

Many studies have examined the predictors of readmissions in various contexts,² yet many issues, to follow, remain unresolved. First, operative

readmissions should be distinguished from medical readmissions. Although medical readmissions often are driven by diminished status of underlying medical conditions, operative readmissions are often the result of postoperative complications.³⁻⁵ Second, early readmissions may be a better quality of care indicator than later in time readmissions, because they may capture potentially preventable care transition issues. Surgery patients discharged from the hospital may need extensive transitional care, including home nursing, wound care, and outpatient follow-ups.⁵ Readmissions 3–4 weeks after surgery are more likely to be related to underlying medical or socioeconomic conditions.⁵ Third, little is known about readmission rates and contributing factors among young and middle-aged populations. Nonelderly patients account for more than 60% of short-term hospital discharges in the United States,⁶ but much of the existing knowledge about predictors of readmissions is derived from Medicare patients aged 65 years and over.⁷⁻¹⁰ Fourth, the associations between patient cost-sharing, insurance arrangements, and postoperative readmissions are unknown. Factors that affect hospital utilization, such as patient-cost sharing, may influence the decision to return to the hospital.¹¹ The range of covered services, treatment waiting time, primary care physician follow-up, and availability of urgent care clinic vary by insurance plan and also may affect surgical readmission rates.¹² Health care providers paid by capitation may have incentives to lessen readmission rates.¹³ Few studies, however, have shown how these factors affect hospital readmissions after operative care.

This study examines the factors associated with increased risk of unplanned hospital readmissions after abdominal surgery in a privately insured, nonelderly population. Our objective is to determine whether increased patient out-of-pocket payments reduce the odds of readmission and whether readmissions are associated with the patient's insurance arrangements. We evaluated both 7-day and 30-day readmissions to provide a better understanding of potentially preventable early readmissions.

METHODS

Data. This observational study used the MarketScan Commercial Claims and Encounters Database from January 2010 to December 2010. The database includes health insurance claims from large employers and health plans across the United States that provide private health care coverage to more than 56 million employees, their spouse,

and dependents.¹⁴ The MarketScan database was linked to 2011 American Community Survey 5-Year Estimate data to obtain information on the median household income of patient's residential area (3-digit zip-code).

Study sample. Nonelderly patients who underwent at least 1 major abdominal surgery in 2010 were included in the analysis. The following procedures were selected based on Diagnosis-Related Group codes: (1) appendectomy; (2) hepatobiliary and pancreatic procedures; (3) major small and large bowel procedures; (4) cholecystectomy; (5) laparoscopic cholecystectomy; (6) operating room procedures for obesity; (7) peritoneal adhesiolysis; (8) rectal resection; (9) stomach, esophageal, duodenal procedure; and (10) splenectomy ([Supplementary Table I](#)). Only the first abdominal surgery was considered if the patient underwent multiple operations during the study period. We excluded from the analysis patients who were transferred to another short-term, acute care hospital, died during the index hospitalization, were discharged against medical advice, or were still within the same hospital (days billed for leave of absence or interim billing). Using the algorithm from 2014 Hospital-Wide All-Cause Unplanned Readmission measures developed by the Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation, we also excluded planned readmissions.¹⁵

Variables. Primary study outcomes were any unplanned readmission within 7 days and 30 days of discharge for abdominal surgery. Because operative patients are likely to be readmitted for postoperative complications, both 7-day and 30-day periods were assessed separately as primary outcomes.

Primary predictors were insurance arrangements and patient cost-sharing. On the basis of incentives to use a particular network of providers, primary care physician assignment, and capitation,¹⁶ insurance plans were categorized as follows: (1) health maintenance organization and point-of-service with capitation (HMO/POS with capitation), (2) exclusive provider organization (EPO), (3) noncapitated POS, (4) high deductible plans, (5) noncapitated preferred provider organization (PPO), and (6) comprehensive plans ([Table I](#)). For enrollees in HMO/POS with capitation, EPO, and POS plans, primary care physicians arrange medical services, including hospitalizations and referrals to specialists. Enrollees in PPO and POS plans have financial incentives to use selected networks of health care providers; enrollees can seek care out of network but will incur

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