

Clinical Science

# Postoperative complications and patient satisfaction: does payer status have an impact?



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## KEYWORDS:

Satisfaction;  
Complications;  
Payer status

## Abstract

**BACKGROUND:** Patient demographics and outcomes may influence patient satisfaction. We aim to investigate the relationship between postoperative complications and survey-based satisfaction in the context of payer status.

**METHODS:** Institutional data were used to identify major complication occurrence and linked to patient satisfaction surveys. The impact of complication occurrence on satisfaction was investigated and stratified by payer status.

**RESULTS:** In all, 1,597 encounters were identified with an 18% major complication rate. Satisfaction scores in specific domains were significantly more likely to be above the median for patients without complications ( $P < .01$ ) and for payer status Medicaid/low income ( $P < .05$ ). In sensitivity analyses, we found no significant interactions among payer status, complications, and satisfaction scores.

**CONCLUSIONS:** Significant differences exist for individual satisfaction survey domains between patients with and without major postoperative complications and by payer status. Payer status was not found to have an impact on the intersection of major complications and patient satisfaction.

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Quality outcome measurements in health care are increasingly used and scrutinized as institutions adjust to the value-based payment era. Key components to value assessment and quality measurements are Patient-Reported Outcome Measures or more specifically patient satisfaction

with overall hospital care.<sup>1</sup> As reports of health care satisfaction are increasingly reported publicly and tied to “pay for performance” initiatives, increased attention is being given to patient satisfaction, its components and factors, and its legitimacy as a true indicator of quality of care.<sup>2,3</sup>

Recent literature has focused on the effect of a variety of factors on national, publicly reported, and standardized patient satisfaction surveys. Patient factors including age, race, preoperative health status, and clinical factors and outcomes including acuity of admission, length of stay, pain, occurrence of complications, and interactions with providers have been shown to affect patient-reported

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satisfaction.<sup>2,4-6</sup> Payer status is an additional relevant socioeconomic factor that may be associated with patient satisfaction, and the relation between patient satisfaction and complications in the context of payer status has not been widely investigated.

Perception of care as detected by standardized national questionnaires has been specifically linked to the occurrence of National Surgical Quality Improvement Program (NSQIP)-defined complications in surgical patients.<sup>2</sup> In this study, we aim to further investigate the relationship between NSQIP-defined postsurgical complications and survey-based satisfaction scores by stratifying these outcomes based on patient payer status. We hypothesize that payer status at a large, academic medical center will affect patient-reported satisfaction after complications occur.

## Methods

The study population consists of surgical inpatient admissions within the specialties of general surgery, orthopedic surgery, gynecology, urology, vascular surgery, neurosurgery, and plastic surgery captured by the NSQIP that were linked to patients who completed Press Ganey Patient Satisfaction Surveys at The University of Iowa Hospitals and Clinics from April 24, 2011, to March 21, 2014. Patient NSQIP encounters were linked to the survey through a unique institutional encounter code. Patient's younger than 18 years, those who died during admission, and those having outpatient surgery were excluded. For patients with more than 1 surgical procedure-survey result during the time period ( $n = 15$ ), only the initial procedure outcomes and surveys were included in the analysis. The University of Iowa Institutional Review Board approved this review.

The Press Ganey (PG) Patient Satisfaction Survey is a proprietary data collection tool distributed by Press Ganey Associates, Inc., of South Bend, Indiana. This survey is used for quality of care and patient satisfaction assessment in 50% of US hospitals accounting for 64% of hospital discharges nationwide.<sup>7</sup> After discharge, all surgical patients at The University of Iowa Hospitals and Clinics receive the PG Inpatient Survey by mail and are asked to provide basic demographic information and to rate the care and services they received during their inpatient admission. This survey contains domains regarding all aspects of a patient's stay including admission, room, meals, nurses, tests and treatments, visitors and family, physician, discharge, personal issues, special services, and overall assessment. In total, there are 64 questions asking for ratings of 1 to 5 with 1 being "very poor" and 5 being "very good" (Appendix). For each patient encounter, raw mean patient satisfaction scores were available for 9 relevant domains: admission, meals, nurses, overall, personal, physician, room, treatments, and visitors.

As part of an initiative to monitor and improve 30-day surgical outcomes, The University of Iowa Hospitals and

Clinics participates in NSQIP by collecting 135 preoperative, operative, and postoperative data points on surgical procedures performed as defined and directed by the NSQIP protocols.<sup>8</sup> A previously described, systemic sampling strategy is used by NSQIP for each of the surgical specialties over the study time period with the exception of the targeted procedures where 100% of cases are collected. Targeted NSQIP procedures and the date that 100% collection began are available through the NSQIP user guide and include colectomy, proctectomy, pancreatectomy, hepatectomy, open carotid endarterectomy, open abdominal aortic aneurysm repair, endovascular abdominal and thoracic aortic aneurysm repair, hysterectomy, craniotomy, total hip arthroplasty, prostatectomy, nephrectomy, and cystectomy.

Surgical data from The University of Iowa Hospitals and Clinics NSQIP database were extracted and analyzed for occurrence of major complications. Fifteen complications were included as defined major complications: wound dehiscence, ventilator greater than 48 hours, unplanned intubation, organ space infection, deep wound infection, pneumonia infection, acute renal failure, myocardial infarction, sepsis and septic shock, pulmonary embolism, stroke, coma greater than 24 hours, bleeding requiring transfusion, and cardiac arrest. Patients were coded dichotomously for occurrence of a major complication (coded "1") or no complication (coded "0").

Payer status groups were defined as "commercial," "Medicare," or "Medicaid/low income." The commercial payer group comprised patients covered by private health plans, including (but not limited to) insurers Blue Cross Blue Shield, Coventry, and United Healthcare. The Medicare payer group included all fee-for-service Medicare and Medicare Advantage plans. The Medicaid/low-income payer category consisted of patients covered by Iowa Care, Iowa Wellness Plan, Medicaid of Iowa, Illinois Medicaid, and Missouri Medicaid and patients designated as being "uncompensated care."

The chi-square test of proportions for categorical variables and paired  $t$  tests for continuous variables were performed between groups on patient-level factors, including age, sex, race, body mass index, American Society of Anesthesiologists (ASA) classification, payer type (Medicare, Medicaid/low income, or commercial), preoperative laboratory values (albumin, creatinine, and international normalized ratio), comorbidities, surgical specialty type, and other health status indicators.

The distribution of the raw PG patient satisfaction scores on each of the 9 domains were non-normal, so nonparametric Mann-Whitney  $U$  tests were performed on the patient satisfaction domain scores to test for unadjusted differences in medians between the "no-complication" group and the "major complication" group. In these tests, the null hypothesis is that the distribution of PG domain scores are similar between groups vs the alternative that the domain scores are lower in the major complication group (ranks of the 2 groups are not equal). Multivariate

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