

# Variation in Medicare Payments and Reimbursement Rates for Hepatopancreatic Surgery Based on Quality: Is There a Financial Incentive for High-Quality Hospitals?

Jay J Idrees, MD, MPH, Brad F Rosinski, BS, Qinyu Chen, MHS, Fabio Bagante, MD, Katuscha Merath, MD, Susan White, PhD, Timothy M Pawlik, MD, MPH, PhD, FACS, FRACS (Hon)

**BACKGROUND:** To better define the financial impact of high-quality care for payers and hospitals, we compared outcomes and Medicare payments between high-quality (HQ) and low-quality (LQ) hospitals after hepatopancreatic surgery.

**STUDY DESIGN:** Between 2013 through 2015, a total of 15,874 Medicare beneficiaries underwent hepatopancreatic surgery. Using the entire cohort, multivariable logistic regression was performed to categorize hospitals into quintiles based on the probability of experiencing a major complication; HQ (bottom 20%) and LQ (top 20%) hospitals were identified. Only HQ and LQ hospitals were included in the final propensity matching to compare payments. Major complication was defined as a complication associated with a length of stay of >75th percentile. Incremental payment and cost of complication were estimated using multivariable linear regression.

**RESULTS:** Major complications occurred in 9.7% (n = 309 of 3,182) at HQ hospitals compared with 20% (n = 625 of 3,130) at LQ hospitals (p < 0.001). The incremental increased payment associated with major complication was \$29,640, which was lower than the incremental hospital cost of \$42,935. The Medicare reimbursement rate was also 6% lower at both HQ and LQ hospitals when a major complication occurred vs not; however, HQ hospitals had a 3% higher reimbursement rate compared with LQ hospitals when a major complication did not occur (p = 0.002). Mean unadjusted Medicare payment was lower at HQ hospitals by \$5,165 per patient vs LQ hospitals (p < 0.001), largely because HQ hospitals had a lower overall incidence of major complications (n = 315 vs n = 625). By having 310 fewer patients with a major complication, HQ hospitals collectively achieved \$3.1 million/year in Medicare savings.

**CONCLUSIONS:** High-quality hospitals are able to achieve substantial Medicare savings by avoiding major complications. Occurrence of major complications was associated with lower Medicare reimbursement rates at both HQ and LQ hospitals vs when no complications occurred. (J Am Coll Surg 2018; ■:1–11. © 2018 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

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From the Department of Surgery, Ohio State University, Wexner Medical Center, Columbus, OH.

Correspondence address: Timothy M Pawlik, MD, MPH, PhD, FACS, FRACS (Hon), Department of Surgery, The Ohio State University, Wexner Medical Center, 395 W 12th Ave, Suite 670, Columbus, OH 43210. email: [tim.pawlik@osumc.edu](mailto:tim.pawlik@osumc.edu)

Cost-containment and improvements in healthcare quality are a focus of healthcare stakeholders. In the current era of cost constraints and limited resources, there is a growing interest among payers, hospitals, and policy makers to implement evidence-based process measures to evaluate quality of care and achieve cost savings by improving outcomes. To this point, since the implementation of the Affordable Care Act, there has been a shift in policy by the Centers for Medicare and Medicaid Services (CMS) from fee for service toward pay for performance

**Abbreviations and Acronyms**

CMS	= Centers for Medicare and Medicaid Services
COE	= Centers of Excellence
HQ	= high quality
LQ	= low quality
MedPAR	= Medicare Analysis Provider Review

and value-based purchasing or bundled care.<sup>1,2</sup> These initiatives have shifted the financial pressure to healthcare institutions, which must demonstrate the ability to provide services more efficiently and cost-effectively to remain profitable. Complex surgical procedures are often associated with high risk of costly complications. With this in mind, these operations have become an important area of focus for payers and providers in the evaluation of outcomes-based payments, as well as opportunities for cost containment.<sup>3,4</sup>

In 2006, CMS issued a national coverage decision that restricted coverage of some complex surgical procedures to “Centers of Excellence” (COE).<sup>5</sup> To qualify as COE, healthcare institutions must meet minimum standards to ensure safety of the procedures and be considered a provider. From both the provider and payer perspective, the current standards for hospital-quality are less well defined. Data about the association between quality of care and Medicare payments are particularly limited for hepatopancreatic surgery, which can be associated with high morbidity and derivative costs. Studying the association of quality and financial expenditures for surgical procedures, such as hepatopancreatic surgery, is timely, as payers move toward value-based payment models. Therefore, the objective of the current study was to compare Medicare payments and reimbursement rates among high-quality (HQ) and low-quality (LQ) hospitals for patients undergoing hepatopancreatic surgery to better define the financial impact of high-quality care for payers and hospitals.

**METHODS****Data source and study population**

Data were analyzed using the Medicare Analysis Provider Review (MedPAR) files for the years 2013 through 2015. The MedPAR contains information on beneficiary demographic characteristics and dates of admission, discharge, and death. Surgical cases were identified from the inpatient hospital file, which contains discharge level data for fee-for-service hospitalizations. The ICD-9-CM procedure codes were used to identify a study cohort of Medicare beneficiaries who underwent liver or pancreatic resection (liver resection: 50.22 [partial] and 50.3

[lobectomy]; pancreatic resection: 52.9 [partial], 52.6 [total], 52.51 [proximal], 52.52 [distal], 52.53 [radical], and 52.7 [pancreaticoduodenectomy]). Patients who underwent liver transplantation, total hepatectomy, or pancreatic transplantation were excluded.

The institutional provider numbers that uniquely identify hospitals from the MedPAR file were used. The MedPAR data from these hospitals were matched with data from the American Hospital Association Annual Survey to obtain additional information about hospital characteristics. Hospital-specific cost to charge ratios were used to estimate the actual costs. This information is typically obtained from hospital accounting reports collected by CMS and was available in the Medicare Provider Utilization and Payment Data for inpatient hospital admissions. These data were linked to the Medicare inpatient file using the unique provider identification. The study was approved by the IRB at The Ohio State University Wexner Medical Center.

**Assessment of Hospital Quality**

The incidence of major complications was used as the metric for assessing hospital quality. Major complications were defined using previously validated ICD-9 codes.<sup>4,6,7</sup> A major complication was defined as the occurrence of renal failure, respiratory failure, pneumonia, sepsis, surgical site infection, hemorrhage, gastrointestinal bleeding, intestinal obstruction, reoperative exploratory laparotomy, and/or venous thromboembolism during hospital admission. These complications were classified as major when they were associated with a length of stay >75<sup>th</sup> percentile.<sup>3,8,9</sup> The criterion of increased length of stay was included to ensure that the complication had a serious clinical impact. This approach, as proposed previously, added clinical face validity and enabled adjustment for the severity of a particular major complication, which otherwise might be difficult to ascertain using administrative data.<sup>8</sup>

Risk-adjusted rates of major complications were calculated at the hospital level and individual hospitals were then ranked by the order of major complication frequency. The rates of major complications were risk and reliability adjusted. Based on rank, hospitals were grouped into quintiles. The lowest quintile represented the top 20% of hospitals with the lowest adjusted rates of major complications and that were categorized as HQ. Likewise, the highest quintile represented the bottom 20% of the hospitals with the highest adjusted rates of major complication and that were categorized as LQ.

**Price standardization of Medicare payments**

Total Medicare claim payments for an episode of care were used for analysis. These claim payments consisted

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