Coronary artery bypass grafting bundled payment proposal will have significant financial impact on hospitals

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ABSTRACT

Objectives: The Centers for Medicare and Medicaid Services plans to institute a 5-year trial of bundled payments for coronary artery bypass grafting through 90 days after discharge. To investigate the impact, we reviewed actual inpatient costs for patients undergoing bypass surgery relative to the target price.

Methods: A total of 13,276 Medicare patients with estimated cost data underwent isolated coronary artery bypass grafting from 2008 to 2015 in 18 hospitals over 8 Medicare-defined regions within the Commonwealth of Virginia. Actual 2015 inpatient costs were compared with estimated target prices for each year of the pilot, based on the previous 3 years and stratified by Diagnosis-Related Group.

Results: The mean 2015 cost per patient was $50,394 with high variation (range, $27,862-$74,169). On average, hospitals would receive a refund of $17,682 in year 1, but then owe Medicare increasing amounts up to $367,985 in year 5. If 2015 were the final year of the pilot, 13 of the 18 hospitals (72\%) would have owed Medicare for cost overruns averaging $614,270 (range, $67,404-$2,102,292). Costs were below the target price at 5 of 18 hospitals, and the Centers for Medicare and Medicaid Services would have paid them an extra $272,355 on average (range, $88,628-$567,429).

Conclusions: Hospitals will face immediate financial pressure due to average cost increases of 3.6\% per year and an automatic reduction in payment. As regional pricing is phased in, hospitals can expect to owe Medicare increasing amounts. The net effect is shifting of financial risks to hospitals, which could restrict access to care for higher-risk patients. (J Thorac Cardiovasc Surg 2018;155:182-8)
Abbreviations and Acronyms

- CMS = Centers for Medicare and Medicaid Services
- CABG = coronary artery bypass grafting
- DRG = Diagnosis-Related Group
- MSA = metropolitan statistical area
- PROM = predicted risk of mortality
- PROMM = predicted risk of morbidity or mortality
- STS = Society of Thoracic Surgeons
- VCSQI = Virginia Cardiac Services Quality Initiative

(CMS) Inpatient Prospective Payment System that bundled inpatient payments. Current efforts at payment reform began with passage of the Patient Protection and Accountable Care Act, which developed the Centers for Medicare and Medicaid Innovation under CMS in 2010. This has been accelerated with the recent passage of Medicare Access and CHIP Reauthorization Act of 2015 that addresses physician payments.

On July 25, 2016, the CMS issued a notice of a proposed rule for CABG bundled payments. Although not the first bundled payment program, this is one of the first to provide a fixed sum of money for comprehensive inpatient and outpatient care. The proposal is for a 5-year trial of bundled payments for isolated CABG from admission through 90 days after discharge in 98 metropolitan statistical areas (MSAs). Any Medicare patient undergoing CABG with a designation of Diagnosis-Related Group (DRG) 231-236 (Table 1) and not participating in a separate alternative payment program would be eligible for the bundled payment program. Hospitals will be paid under the standard fee-for-service arrangement with inpatient hospital costs reimbursed on the basis of the procedure, with the CMS making payments based on the DRG. At the end of each year, the CMS will reconcile all payments compared with a target price that is based on cost data from the prior 3 years. It phases in regional pricing and increasing caps for the reconciliation payment. The pilot program will split their calculations by phase of care and set target prices for the hospitalization and postdischarge care separately. To investigate the impact of the inpatient component of the proposal, we reviewed actual costs for patients undergoing CABG relative to the expected target price.

MATERIALS AND METHODS

Patient Data

The VCSQI is composed of 18 hospitals and cardiac surgical practices in Virginia that includes approximately 99% of adult cardiac surgery cases in the state. The hospitals are spread over 8 MSAs with a range of 1 to 5 hospitals per MSA. VCSQI clinical and cost data acquisition and matching have been described. Administrative, demographic, and clinical data are collected by each participating institution using the current Society of Thoracic Surgeons (STS) clinical data entry form. The VCSQI database pairs STS data with hospital discharge information. Uniform Billing 04/92 files are matched to the STS data, with a successful matching rate of 99%. These identify charges that are classified on the basis of International Classification of Diseases, Ninth Revision–based revenue codes. Cost-to-charge ratios submitted to the CMS by each institution are used to estimate costs. Cost data were adjusted to 2015 dollars using the market basket for the CMS Inpatient Prospective Payment System to account for medical specific inflation.

Records for isolated CABG (n = 13,290) for patients insured by Medicare were identified for the period January 1, 2008, to December 31, 2015. Patients were excluded for missing cost data. Standard STS definitions were used, including operative mortality (in-hospital or 30-day mortality) and major morbidity (permanent stroke, prolonged ventilation, reoperation, renal failure, and deep sternal wound infection). This investigation was a secondary analysis of the VCSQI data registry without Health Insurance Portability and Accountability Act patient identifiers. Business associates agreements exist among VCSQI, member hospitals, and the database vendor (ARMUS Corporation, San Mateo, Calif). The study was granted exemption by the University of Virginia Institutional Review Board.

Bundled Payment Modeling

All hospitals were categorized by the MSA for analysis in a blinded manner. Historical pricing was calculated using inflation-adjusted total hospital costs from 2012 to 2014. Costs were stratified by DRG (Table 1) for risk-adjustment purposes. A target price was then calculated for each of the 3 phases of the pilot program: Phase 1 is based on two thirds hospital cost and one third regional cost; phase 2 is one third hospital and two thirds regional cost; phase 3 is 100% regional costs (Table 2). An across the board 3% reduction in the target price was incorporated; however, adjustment for high-quality hospitals could not be performed because of the lack of CMS quality data and cutoffs. This calculated target price was compared with actual costs for 2015. The reconciliation payment is the difference between the actual cost and the target price (actual 2015 costs – historical target price). As the pilot program progresses, there is an increasing cap on the reconciliation payment (Table 2). The first year precluded hospitals owing CMS reconciliation payments; however, this cap increased for years 2 to 5 and included both downside risk where hospitals owed CMS a reconciliation payment and upside risk where hospitals would receive money from CMS. Total hospital reconciliation payments were calculated using DRG-specific prices and volume. Hospitals were classified as penalized if they owed money to the CMS in the reconciliation payment for being over the target price, whereas hospitals that were paid by CMS for being under the target price were categorized as rewarded.

Statistical Analysis

Categoric data were summarized by proportions, and continuous data were summarized by median and interquartile range because of skewness, except for cost data, which were presented as mean and standard deviation. Baseline characteristics and short-term outcomes were compared by Mann–Whitney U test or chi-square test as appropriate. Multivariate generalized linear modeling was used to calculate inflation-adjusted total hospital cost as a function of MSA with nested models containing DRG and STS predicted risk of mortality (PROM) or morbidity or mortality (PROMM). All statistical analyses were performed using SAS version 9.4 (SAS Institute, Inc, Cary, NC). The significance level of all tests was set at alpha = 0.05.

RESULTS

The baseline characteristics and short-term outcomes for penalized and rewarded hospitals are displayed in Table 3. Patients cared for in penalized hospitals were statistically higher risk as measured by STS PROM (1.5% [95% CI 0.9%-2.8%] vs 1.4% [0.9%-2.6%], P = .0005). This
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