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the cost of quality

how VBP scores correlate with hospital costs

Findings of a study suggest a higher total performance score under the Medicare value-based purchasing program may correlate with higher expenditures on routine services that are likely to have an impact on patient satisfaction.

Medicare's value-based purchasing (VBP) program was introduced in federal fiscal year 2013 (FFY13) to begin adjusting a hospital's payment on the basis of measureable quality indicators. Other payers are also exploring ways to adjust payment for care not only according to the services provided, but also according to the quality of those services. As more payers adopt these strategies and potentially more revenue is based upon such measures, it will become increasingly

important for hospitals to understand and manage the relationships among their costs and the quality measures that impact their revenue.

The Medicare VBP system is a first opportunity to explore such relationships. Hospitals are now adjusting to CMS's VBP program and the new dimension of variability it brings to Medicare inpatient prospective payment system (IPPS) payment. A comparison of total performance scores (TPSs) that the Centers for Medicare & Medicaid Services (CMS) defines as part of VBP with Medicare cost report data for corresponding measurement periods, as is provided here, may give hospitals useful insights to begin preparing for the effects of VBP.

This study builds on an earlier study published in the January 2012 issue of *hfm*, which described the VBP program's design and assessed how hospitals might fare under the program. The same techniques that were used in the previous study to project a TPS for each hospital were also used here to provide a basis for correlating those scores with costs as reported by each hospital for the corresponding measurement periods (see the sidebar on page 52).

In the earlier article, projected TPSs were used to determine common characteristics among the hospitals that exhibited the best performance

AT A GLANCE

- > A study sought to correlate projected total performance scores (TPSs) for hospitals under the Medicare value-based purchasing (VBP) program with routine costs as reported by each hospital for the corresponding measurement periods.
- > The study focused on routine service costs and common departmental costs because they are generally shared among all hospitals.
- > The study's findings suggest that these costs tend to be higher among hospitals that achieve higher levels of quality as measured by VBP scores.

under the VBP approach. In a similar manner, TPSs are used in this article to determine relative costs among hospitals according to their scores. The focus here is on routine service costs and common departmental costs because they are generally shared among all hospitals. Analyzing these services offers a common ground for study by sticking with common services to avoid operational variations among hospitals. This narrow focus

represents only one small area of inquiry amid a much broader array of possible areas for analysis. Future studies, for example, might focus on hospitals providing specific clinical services and process of care measures for only those hospitals that deliver these services. While outside the scope of this analysis, there may also be an opportunity to address questions regarding fixed versus variable costs and their impact on VBP performance.

TPSs: A Review

The method used by the Centers for Medicare & Medicaid Services (CMS) to determine a hospital's total performance score (TPS) under the value-based purchasing (VBP) program was described in an article published in January 2012 issue of *hfm* (Klein, E., and Shoemaker, P., "Value-Based Purchasing: A Preview of Quality Scoring and Incentive Payments"). The article also described the method that the authors used to project TPSs for all hospitals included in the study, which could then be correlated with costs reported by the hospitals on Medicare cost reports for the corresponding measurement periods.

A brief recap of that discussion follows.

A hospital's TPS is determined according to certain clinical practices (i.e., process of care measures) and patient satisfaction surveys (i.e., patient experience measures), as measured during a recent performance period and compared with a prior baseline period. Hospitals are familiar with these measures because they have been part of CMS's hospital Inpatient Quality Reporting (IQR) program, which the agency introduced in

FY05. Under IQR, hospitals self-report on prescribed measures, and the measures are published on the Hospital Compare website. The VBP program uses the following measures in calculating each hospital's overall TPS:

- > **Clinical Process of Care domain**
 - Fibrinolytic therapy received within 30 minutes of arrival in the hospital
 - Primary PCI received within 90 minutes of arrival in the hospital
 - Discharge instructions
 - Blood cultures performed in the emergency department prior to initial antibiotic received in hospital
 - Initial antibiotic selection for CAP in immunocompetent patient
 - Prophylactic antibiotic received within one hour prior to surgical incision
 - Prophylactic antibiotic selection for surgical patients
 - Prophylactic antibiotics discontinued within 24 hours after surgery
 - Cardiac surgery patients with controlled 6 a.m. postoperative serum glucose
 - Surgery patients with recommended venous thromboembolism prophylaxis ordered

- Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours
- Surgery patients on Beta Blocker prior to arrival who received Beta Blocker during perioperative period

- > **Patient Experience of Care domain**
 - Nurses communicated well (Always)
 - Physicians communicated well (Always)
 - Help received quickly (Always)
 - Pain controlled well (Always)
 - Staff explained medicines (Always)
 - Room and bath kept clean (Always)
 - Area quiet at night (Always)
 - Given discharge instructions (Yes)
 - Overall hospital rating (High)
 - Would recommend hospital (Definitely)

For purposes of both the January study and the current study, a TPS was calculated for each hospital based on Hospital Compare measures for FY10. The results disclosed a fairly normal distribution centered around a score of 37, with a small number of exceptional hospitals scoring above 80. The lowest hospital TPS was 0 and the highest TPS was 100, with a median score of 37.

This study also used patient satisfaction scores as determined from HCAHPS surveys because they are common among all hospitals.

For purposes of comparison, the 3,167 hospitals included in the study are grouped into quartiles according to the rank of their quality scores, with the maximum TPSs in each quartile (from Q1 to Q4) being 28, 36, 47, and 100, respectively. Under the VBP program, hospitals above the

TOTAL PERFORMANCE SCORE RANGES, BY QUARTILE

Quartile	Number of Hospitals	Minimum	Maximum
Q1	772	0	28
Q2	715	29	36
Q3	809	37	47
Q4	871	48	100

The VBP program for FY13 was described in a final rule issued by CMS on May 6, 2011. Both studies are based on the final rule for CMS's VBP program for FY13, which was issued on May 6, 2011, and which describes the method for determining incentive payments for the performance period of July 1, 2011–March 31, 2012. This study and the January study use data for FY10, which was the most recent period available at the time of the initial study.

Quality measures for determining hospitals' TPSs were drawn from publicly available data on CMS's Hospital Compare website. Incentive payments were calculated from publicly available Medicare claims data in the Medicare Provider Analysis and Review (MedPAR) database. The exhibit below

displays the periods that will drive the program in FY13 and the corresponding data that were the most recent available in January 2012 for previewing its impact.

In formulating the original study, care was taken to include only the subsection (d) hospitals that will be subject to VBP. During its first year, the program applies only to inpatients paid under the inpatient prospective payment system (IPPS) and cared for by short-term acute care hospitals in the 50 states plus Washington, D.C. (Hospitals in Maryland, however, are currently included in the VBP program even though they are exempt from IPPS.) Critical access hospitals and specialty hospitals (e.g., psychiatric, rehabilitation, and children's hospitals) are excluded from the program.

Inpatients not paid under IPPS are also excluded (e.g., non-Medicare and Medicare Advantage).

To be eligible for incentive payments, a hospital must have a TPS score based on at least four clinical process measures plus patient experience measures based on at least 100 HCAHPS surveys. To the extent possible, this study applies these exclusions with quality measures obtained from Hospital Compare. Unfortunately, however, Hospital Compare identifies only hospitals with fewer than 300 surveys, so the hospitals with fewer than 100 surveys cannot be identified for exclusion. Further, it was not possible to exclude low-volume hospital adjustment payments due to limitations of the MedPAR data.

REPORTING PERIODS AND STATISTICS FOR FY13 VALUE-BASED PURCHASING (VBP) AND CURRENTLY AVAILABLE DATA

	VBP for FY13	This Study
Performance period	July 1, 2011–March 31, 2012	Oct. 1, 2009–Sept. 30, 2010
Baseline period	July 1, 2010–March 31, 2011	Oct. 1, 2008–Sept. 30, 2009
Number of hospitals	3,092	3,167
Withholding amount	\$850 million	\$861 million

AVERAGE GENERAL MEDICAL AND SURGICAL COSTS PER DAY BY TPS QUARTILE

Quartile	Total	Nonlabor	Labor
Q1	\$908.77	\$535.20	\$375.50
Q2	\$934.09	\$548.33	\$385.76
Q3	\$960.48	\$569.03	\$391.45
Q4	\$1,132.39	\$699.34	\$439.60

AVERAGE ROUTINE SERVICES COST PER DAY BY TPS QUARTILE

Quartile	Total	Nonlabor	Labor
Q1	\$914.29	\$536.81	\$381.38
Q2	\$963.36	\$564.52	\$398.84
Q3	\$981.82	\$578.92	\$404.90
Q4	\$1,144.53	\$705.04	\$450.20

median TPS will receive financial incentives whereas hospitals below the median will lose payment.

Routine Service Costs

Routine services are the accommodation or bed type settings representing the common services necessary to conduct inpatient operations. These are typically thought of as “room and board” and “nursing services.” As these basic services are part of every admission, examining them offers an insight into the operating characteristics and efficiency of a hospital. The study used publicly available Medicare cost report data from Worksheet A to gather routine service costs for each facility.

This study focused on the costs associated with a common setting: general medical and surgical beds. Costs associated with salaries were wage adjusted according to CMS wage indexes for each hospital for FY10. Labor costs and nonlabor costs are reported separately as well as the combined total cost. To facilitate meaningful comparisons, costs were then divided by the number of patient

days within each accommodation setting to calculate cost per day. The upper exhibit at left shows average values for each quartile. Please note that because average values for each category were determined separately, labor and nonlabor costs per day cannot be added together to equal total cost per day.

The TPS measurements introduced by VBP give us a measure for testing whether quality is free or whether it is the result of investing resources in routine patient care. These data verify what experienced hospital professionals might expect. The highest level of quality is supported by the highest costs per day. Both labor and nonlabor expenditures increase among higher performing hospitals. However, it is worth noting that while higher staffing expenditures would appear to equate with higher quality measurements, this basic examination of costs per day cannot differentiate among staffing levels, skill mix, and hours worked. Hospitals are challenged to manage these components of labor cost to achieve effective productivity. Unfortunately, the data available from the cost report limits our ability to examine how the dollars spent on staffing are distributed among staff types.

Overall inpatient routine service costs per day are shown in the lower exhibit at left. These services include all service settings including both general medical/surgical and all intensive care beds. Again the data show a clear trend of greater costs per day as TPS score performance improves.

To ensure that patient severity levels were not a contributing factor, the median case mix index was calculated for each quartile as shown in the top exhibit on page 55. These data show hospitals scoring in the top quartile with a similar, or marginally lower case mix index than lower scoring groups. It would not seem that case severity is a factor in the additional costs.

Environmental Costs

Forty percent of a hospital's TPS measurement is based on patient satisfaction. This portion of the TPS is referred to as the Patient Experience of Care (PEOC) domain and is compiled from HCAHPS surveys completed by a sampling of all patients (i.e., not only Medicare patients). To analyze how the costs of environmental services affected patient perceptions, this study compared five different departmental costs. Hospitals were stratified into quartiles based on their PEOC scores and costs per day were determined.

The middle exhibit at right depicts the per diem costs for maintenance and plant operations among the PEOC scoring quartiles. The correlation between higher expenditures in these areas and higher patient satisfaction is suggestive—and in any event, it is apparent that hospitals scoring in the highest quartile for surveys of patient experiences spend more in managing, operating, and maintaining their facilities. It also makes intuitive sense that hospitals investing more in environmental services are likely to make a more favorable impression.

From a medical perspective of patient satisfaction, this relationship might seem confusing. Quality is partially defined as meeting patient expectations, and the HCAHPS survey is based solely on patient satisfaction. Patients typically cannot judge clinical competence, yet they are keenly aware of their comfort. When considered from an accommodation/hospitality setting, these results can be viewed relative to that of a hotel stay if one bears in mind that the majority of a hospital stay involves the patient confined to a room. Most can relate to having stayed in a roadside motel run on a shoestring budget: Air-conditioning barely cools the room, the hot water is gone by 8 a.m., and light bulbs flicker. Surely the same traveler knows of other facilities where the paint on the wall is fresh, water pressure

MEDIAN CASE MIX INDEX (CMI) BY TPS QUARTILE

Quartile	CMI
Q1	1.43
Q2	1.46
Q3	1.45
Q4	1.44

AVERAGE ENVIRONMENTAL COSTS PER DAY BY PATIENT EXPERIENCE OF CARE (PEOC) QUARTILE

Quartile	Maintenance	Operation of Plant
Q1	\$80.84	\$104.26
Q2	\$75.00	\$103.91
Q3	\$82.30	\$111.83
Q4	\$139.16	\$180.67

AVERAGE LAUNDRY, HOUSEKEEPING, AND DIETARY COSTS PER DAY BY PEOC QUARTILE

Quartile	Laundry	Housekeeping	Dietary
Q1	\$13.03	\$46.78	\$54.79
Q2	\$12.98	\$45.93	\$56.16
Q3	\$13.79	\$48.08	\$61.27
Q4	\$22.60	\$62.46	\$81.60

exists, and the HVAC doesn't sound like a train derailment. Is there any question which hotel delivers a higher quality experience?

Similarly, costs associated with services even more directly related to patient comfort in the bottom exhibit above show a consistent relationship with quality measurements. Although those data do not show to what extent hospitals that had higher costs in these areas were specifically allocating those costs in ways that improve patient comfort, one might easily expect that hospitals investing more in such services will receive higher PEOC scores. This relationship between

NUMBER OF SYSTEM AND NONSYSTEM HOSPITALS BY TPS QUARTILE

Quartile	In a System	Independent	Percentage in a System
Q1	421	351	54.5%
Q2	450	265	62.9%
Q3	556	253	68.7%
Q4	621	250	71.3%
Total	2,048	1,119	64.7%

spending and a perception of quality again plays into the previously depicted hotel analogy.

Independent Versus System Hospitals

An interesting relationship was noted between hospitals that operate within a greater healthcare system and independent hospitals. System hospitals tended toward higher TPS measures, whereas independent hospitals tended toward lower scores. The exhibit above illustrates this inverse tendency. System hospitals may benefit from shared policies and procedures as well as collaborations that enable them to achieve more efficient performance and higher scores under VBP.

The Cost of Quality—and of Patient Satisfaction

It appears that there are higher operating costs among hospitals that achieve higher levels of quality as measured by VBP scores. This presents a paradox for hospitals. Although Medicare has ushered in VBP as a way to encourage higher levels of quality, the program simultaneously applies relentless pressure for hospitals to reduce the costs of care. It is reasonable to ask whether cost reductions may ultimately cause reductions in the quality of patient care.

As this study focused entirely upon nonclinical measures of VBP and routine care costs, it is worth noting that a significant amount of research has been done indicating that improvement in clinical quality measures may result in cost reductions. The relationship between these potential cost savings and higher costs presented here may be a fruitful topic for future investigation.

It will be increasingly important for hospitals to be mindful of their performance within systems perceived as measuring the quality of care provided. Such initiatives are in their infancy and likely to evolve quickly as well as grow in their share of financial impact. Beyond financial impact, the potential for positive and negative publicity related to program performance can also have implications for any hospital. Hospitals may wish to compare their own TPS and PEOC measurements alongside operating costs to understand how their own experiences compare with these national observations. As hospitals become more experienced with the VBP program and begin adopting TPS measurements along with other management indicators, some may find ways to excel in providing measurably high levels of quality cost-effectively. ●

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