Hospital Pay-For-Performance Programs In Maryland Produced Strong Results, Including Reduced Hospital-Acquired Conditions

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ABSTRACT Over the past decade Medicare has put in place several pay-for-performance programs for hospitals, including one that stopped paying hospitals for treating hospital-acquired conditions and the Hospital Value-Based Purchasing Program that went into effect in October 2012. In this article we describe how the State of Maryland crafted two pay-for-performance programs applicable to all hospitals and payers—a Quality-Based Reimbursement Program similar to Medicare’s value-based purchasing program and a separate program that compared hospitals’ risk-adjusted relative performance on a broad array of hospital-acquired conditions. In the first program, all clinical process-of-care measures improved from 2007 to 2010, and variations among hospitals decreased substantially. For example, the statewide average rate of provision of influenza vaccines to patients with pneumonia increased by 20.5 percentage points, from 71.5 percent in 2007 to 92.0 percent in 2010. As a result of the second program, hospital-acquired conditions in the state declined by 15.26 percent over two years, with estimated cost savings of $110.9 million over that period. Extrapolating these results, the Medicare fee-for-service program nationally would have saved $1.3 billion over two years by implementing a similar hospital-acquired conditions program. The state programs used strong and consistent financial incentives to motivate hospitals’ efforts to improve quality. This experience demonstrates that successful state experimentation can inform and influence federal policy and efforts to coordinate payment strategies in other states.
although there have been improvements in the processes of care in various areas, there is limited evidence that patient outcomes and overall care quality have improved.1

Since 1977 the State of Maryland has operated a prospective hospital payment system that establishes specific payments for all inpatient and outpatient services provided in acute care hospitals for all payers, both public and private. A federal waiver exempts Maryland hospitals from national Medicare and state Medicaid fee schedules. The all-payer feature of the system, along with the broad statutory authority, has allowed the Health Services Cost Review Commission, the state agency that establishes payment rates, to create consistent payment incentives for hospitals to contain cost growth, improve access to care, and implement other payment innovations. This situation contrasts with that in other states, where payment levels, and thus financial incentives, for similar services vary considerably across payers.4

Many of the commission’s payment innovations have occurred in advance of or in tandem with evolving payment programs established by the Centers for Medicare and Medicaid Services (CMS). All have developed in close and continuous discussions with hospitals, providers, patient representatives, and payers. Two CMS programs, a plan to implement a Medicare Hospital Value-Based Purchasing Program submitted to Congress in 2007 and a nonpayment policy for hospital-acquired conditions, which started in 2008, provided the impetus for the development of two similar initiatives in Maryland at about the same time.5

Over the course of its thirty-five-year history, Maryland’s hospital payment system has controlled the growth in hospital costs per case.6 However, most reviews of all-payer systems, including Maryland’s, have focused on cost containment, leaving the question of their impact on the quality of care unanswered. This article describes the two pay-for-performance programs implemented in Maryland and evaluates their impact on the quality of inpatient care.

Using Process Measures
In 2003, as the federal government was first developing hospital pay-for-performance programs for Medicare, Maryland began to develop its own program, called the Quality-Based Reimbursement Program. Maryland launched its program in 2008. The program provides financial incentives—both rewards and penalties—in Maryland hospital rates to encourage improvements in process-of-care measures, such as giving heart attack patients aspirin upon arrival at the hospital, or administering blood-thinning agents to surgery patients following certain surgical procedures.

In creating the program, the commission worked with hospital and private payer representatives to develop a program that mirrored the proposed federal pay-for-performance initiative but also could be implemented in the context of Maryland’s all-payer rate system. Maryland’s program initially included nineteen core CMS and Joint Commission process measures in the following four care domains: heart attack, heart failure, pneumonia, and surgical infection prevention. The list of measures is updated each year to be consistent with the changes in CMS and Joint Commission reporting. To incorporate and strengthen incentives for patient-centered care into the performance metric, Hospital Consumer Assessment of Healthcare Providers and Systems scores were integrated into the program in 2012.

Maryland’s Quality-Based Reimbursement Program and CMS’s value-based purchasing program calculate hospital performance using very similar measures. Maryland’s program evaluates hospital performance based on the higher of the following two scores: achievement, which compares absolute level of hospital performance to the state benchmarks, and improvement, which measures changes from base year.

The Maryland program differs from the CMS program in that in addition to the scores for each time a measure is provided, referred as the “opportunity” model, there is an “appropriateness” score that measures the percentage of patients who received all of the interventions subject to measurement that they were supposed to receive—in other words, the share of patients whose care had a perfect score. This score was added in the program’s second year to better distinguish hospital performance and shift some focus to the patient as the unit of measurement. With the added “appropriateness” score, “topped-off” measures, on which the majority of hospitals perform at a very high level with very little variation, were kept in the program, diverging from the CMS methodology.

In both the Maryland and CMS programs, rewards and penalties are distributed in a revenue-neutral manner with a linear distribution function. In other words, the net increases in rates for better-performing hospitals are funded entirely by net decreases in rates for poorer-performing hospitals. The worst-performing hospital loses 0.5 percent of its total inpatient revenue (Exhibit 1). In state fiscal year 2012, Maryland reallocated $7.5 million among its forty-six hospitals.7
Moving To Outcome-Based Pay-For-Performance

Establishing Maryland’s first pay-for-performance program, the Maryland Quality-Based Reimbursement Program, required five years of deliberations with hospital industry and payers. That process expedited the introduction of the state’s second pay-for-performance program, the Maryland Hospital-Acquired Conditions Program, which used outcome measures and was introduced a year later, in 2009.

As CMS was developing and preparing to implement its hospital-acquired conditions program for hospitals participating in the inpatient prospective payment system in the rest of the country, Maryland’s Health Services Cost Review Commission and state hospital and payer representatives were committed to keep pace with quality-based incentive programs implemented by Medicare. Thus, the Medicare waiver allowed Maryland to experiment with variations on the general themes outlined by the federal government and to create a program addressing the needs of the state’s all-payer system.

Hospital representatives and clinicians identified concerns about the unintended consequences of CMS’s proposed hospital-acquired conditions methodology, which reduces payments for a specific case if the selected hospital-acquired condition was present. Also, because this methodology focused only on complication categories that were thought to be 100 percent or nearly 100 percent preventable, it greatly limited the range of complications that could be included in the program.

The Maryland hospital-acquired conditions program was structured to overcome these two limitations. Thus, the commission adopted a rate-based approach, which compares hospitals’ risk-adjusted performance rate to the state average on a much broader array of hospital-acquired conditions. This construct made use of 3M Health Information Systems’ list of sixty-four potentially preventable complications. For a complete list of the complications, see the online Appendix.8

Potentially preventable complications are defined as either harmful events or negative outcomes that are unlikely to be a consequence of the natural progression of the underlying illness. Harmful events can include such things as accidental laceration during a procedure or improper administration of medication. Negative outcomes can include such things as pneumonia and urinary tract infections that develop after hospital admission and that may result from processes of care and treatment and therefore are potentially preventable.9

Potentially preventable complications are, like hospital-acquired conditions, identified based on the so-called present on admission information that hospitals provide with the hospital discharge data they are required to submit to the Health Services Cost Review Commission. “Present on admission” data are reported for each secondary diagnosis in the medical record and indicate whether the patient had the condition when he or she was admitted to the hospital. If other conditions occur later during the hospital stay, they may be the result of hospital-acquired conditions or complications.

Maryland’s hospital discharge database, sim-

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**EXHIBIT 1**

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Hospital ranking</th>
<th>Total inpatient revenue ($)</th>
<th>Performance score</th>
<th>Reallocation (%)</th>
<th>Penalty/reward ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>156,467,241</td>
<td>0.2740</td>
<td>-0.5000</td>
<td>-782,336</td>
</tr>
<tr>
<td>M</td>
<td>2</td>
<td>171,570,805</td>
<td>0.2922</td>
<td>-0.4685</td>
<td>-803,947</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>207,786,312</td>
<td>0.3734</td>
<td>-0.3281</td>
<td>-681,712</td>
</tr>
<tr>
<td>K</td>
<td>4</td>
<td>345,854,256</td>
<td>0.3745</td>
<td>-0.3262</td>
<td>-1,128,110</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>244,920,000</td>
<td>0.3883</td>
<td>-0.3023</td>
<td>-740,425</td>
</tr>
<tr>
<td>X</td>
<td>42</td>
<td>117,198,436</td>
<td>0.7461</td>
<td>0.3613</td>
<td>423,439</td>
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<tr>
<td>Z</td>
<td>43</td>
<td>218,909,250</td>
<td>0.7461</td>
<td>0.3613</td>
<td>790,921</td>
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<tr>
<td>G</td>
<td>44</td>
<td>89,806,444</td>
<td>0.7753</td>
<td>0.4189</td>
<td>376,243</td>
</tr>
<tr>
<td>H</td>
<td>45</td>
<td>186,491,898</td>
<td>0.8072</td>
<td>0.4819</td>
<td>898,756</td>
</tr>
<tr>
<td>S</td>
<td>46</td>
<td>59,372,280</td>
<td>0.8794</td>
<td>0.6245</td>
<td>370,761</td>
</tr>
</tbody>
</table>

**Source:** Maryland Health Services Cost Review Commission (Note 7 in text). **Notes:** Lower rankings and lower performance scores indicate worse quality of care. ‘Reallocation is the percentage of total inpatient revenue that the hospital was penalized or rewarded by, based on its performance score. The maximum penalty for the quality-based reimbursement program is set at 0.5 percent, and the distribution of penalties and rewards is determined based on a linear scale.
Pay-for-performance programs, such as the one in Maryland, which is known for its high volume of hospital discharges, rely on the accuracy of coding to ensure fair payment. The Maryland state program for hospital-acquired conditions program relies on the “present on admission” information of these conditions, monitoring the coding is important for that program. If hospitals incorrectly report conditions to be present on admission, that would affect hospitals’ performance in the program.

For example, indicating that all secondary diagnoses are present on admission would falsely lower a hospital’s rates of hospital-acquired conditions. One hospital was excluded from participation in the first year of the program because it appeared that the hospital had coded nearly all secondary diagnoses as present on admission.

The commission uses established administrative and chart review processes to audit coding on an ongoing basis, and it uses screening algorithms to assess the accuracy of the present on admission indicator. A recent analysis by an outside evaluator indicated that 98 percent of Maryland hospitals are correctly coding for present on admission, compared to 53 percent of hospitals nationally.

The state program for hospital-acquired conditions differs from CMS’s program in several ways. The Maryland program calculates a hospital’s expected complication rates given the severity of its patient mix based on a predefined performance standard—the state average in the previous year—and compares predicted or expected rates of complications to the observed rates to determine the hospital’s overall performance ranking.

Hospitals’ performance is then weighted based on an estimate of the incremental cost or resource use associated with each complication category. Incremental costs associated with each potentially preventable complication are estimated using a statewide regression analysis of standardized charges in the previous year, which controls for the admission All Patient Refined Diagnosis Related Groups and severity of illness.

Maryland excludes fifteen of the sixty-four potentially preventable complications because of statistical insignificance of the estimated incremental cost or clinical or measurement concerns. For example, during the public vetting process, providers pointed out that the coding and testing practices for Clostridium difficile colitis varied greatly among hospitals, which prevented a valid measurement of this condition. The complete list of complications, including the excluded ones, is in the online Appendix, along with the results of the regression analysis.

The final ranking of the hospitals in Maryland’s hospital-acquired conditions program is based on overall additional resource use resulting from high or low complication rates for each hospital as a percentage of its total inpatient charges. Similar to the first program, the incentive payments are distributed based on this ranking, using a linear function in a revenue-neutral manner.

The commission has gradually increased the amount of revenue at risk for penalties and rewards, reflecting more emphasis on outcome-based pay-for-performance. In state fiscal year 2013, which will end June 30, 2013, the maximum penalty for the worst performing hospital was raised to 2 percent of the hospital’s total inpatient revenue, resulting in a reallocation of $16.7 million as rewards or penalties—an increase from $2.1 million in the first year.

**Study Data And Methods**
To evaluate the impact of the Quality-Based Reimbursement Program on the clinical process-of-care measures, we examined state average rates and hospital variation in the rates over a four-year period (2007–10) using box plots. We also compared trends in Maryland with those in the United States as a whole for the same period and tested the statistical significance using t-tests for two independent samples.

To evaluate the impact of the state’s hospital-
acquired conditions program, we estimated the changes in the rates of each potentially preventable complication from the base period and estimated total savings using incremental cost estimates of each potentially preventable condition. As discussed above, these rates are risk-adjusted for patient mix using All Patient Refined Diagnosis Related Groups and severity-of-illness categories with an indirect adjustment method.

The incremental cost of each complication was estimated separately for each year using a linear regression controlling for differences between hospitals. Because we did not have any comparison group or trends prior to the implementation of the program, we compared the changes in the excluded complications ($N = 15$) to the ones included in the first two years of the program ($N = 49$) to separate the impact of the program from the secular trends. The Cochran-Mantel-Haenszel test was used to determine whether observed risk-adjusted changes were statistically significant.

Study Results
Our analysis of trends in the clinical process-of-care measures revealed promising results. All measures improved from 2007 to 2010, and, most important, variation between hospitals decreased substantially in almost all measures (Appendix Exhibit).

The results of the comparisons of the changes in Maryland to those in the nation were inconclusive. Across all measures, the average change from 2007 to 2010 was 7.31 percentage points in Maryland, compared to 6.86 percentage points in the United States as a whole. Almost half of the measures improved faster in Maryland than the United States. However, trends in only three individual measures were significantly different in Maryland than the United States. The only measure that improved faster in Maryland than the nation was the provision of influenza vaccines to patients with pneumonia. In that case the statewide average increased by 20.5 percentage points, from 71.5 percent in 2007 to 92.0 percent in 2010. This was in comparison to the national increase of 15.1 percentage points, from 78.7 percent to 93.8 percent during the same period.

In two measures, heart failure patients given smoking counseling and surgery patients given an antibiotic at the right time, Maryland lagged behind the national improvement, as shown in the online Appendix.

The Health Services Cost Review Commission noted improvements in patient outcomes and costs in the hospital-acquired conditions program, based on the data from the initial two years (Exhibit 2). Based on the regression estimates for state fiscal year 2009, the total cost of hospital-acquired conditions in Maryland was $621 million (7.09 percent of total inpatient costs), which could be avoided with proper preventive steps. Extrapolated to inpatient care funded by Medicare fee-for-service nationally, using the same percentage of total inpatient cost from Maryland, this result would be equivalent to $8.2 billion in excess costs associated with preventable hospital-acquired conditions in the care of Medicare recipients each year.

During the first two years that Maryland’s incentive program was in place, complication rates declined by 15.26 percent, resulting in $110.9 million savings in the system, which equals 0.6 percent of total inpatient costs. The three greatest cost reductions occurred in urinary tract infections, septicemia and severe infections, and pneumonia and other lung infections (Exhibit 2). The changes in the complications were consistent over two years: 75 percent of complications declined in both years, and 67 percent had statistically significant changes over two years. For trends and cost savings in all sixty-four complications, see the Appendix.

Using the percentage of savings from Maryland, which is 0.6 percent of costs, as noted above, similar results would be a $1.3 billion cost reduction from the Medicare fee-for-service program nationally in two years, as total Medicare inpatient hospital spending for fee-for-service beneficiaries was $116 billion in 2010. For all hospital care, across all payers, a program such as Maryland’s incentive program could reduce costs by $5.3 billion in two years, if we assume that 58 percent of $814 billion hospital spending was for inpatient care. Because there was no control group, we compared the changes in the complications included in Maryland’s hospital-acquired conditions program to those excluded from the program. As noted, of the sixty-four potentially preventable complications, fifteen were excluded because there were no significant incremental costs, or because of clinical or measurement concerns.

We found that complications included in the program declined by 18.59 percent in two years, while the excluded complications increased by 2.76 percent over the same period (Exhibit 3). A further analysis is needed to explain the cause of this finding.

However, the overall increase in the excluded complications is the result of increases in two obstetrical complications—namely, obstetrical hemorrhage without transfusion (24 percent), and medical and anesthesia obstetric complications (11.8 percent). The rates of change in excluded complications may reflect real changes in
Statewide Changes In Potentially Preventable Complication Rates And Cost Savings In Maryland Hospitals, State Fiscal Years 2009-11

<table>
<thead>
<tr>
<th>Complication</th>
<th>Risk-adjusted complication rate per 1,000 people at risk</th>
<th>Change (%) FY 09-10</th>
<th>Change (%) FY 09-11</th>
<th>Cost change ($) FY 09-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>All complications</td>
<td>2.38</td>
<td>-8.85***</td>
<td>-7.03***</td>
<td>-110,957,872</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>10.85</td>
<td>-27.10***</td>
<td>-12.01***</td>
<td>-17,254,363</td>
</tr>
<tr>
<td>Septicemia and severe infections</td>
<td>4.87</td>
<td>-20.53***</td>
<td>-19.64***</td>
<td>-16,564,123</td>
</tr>
<tr>
<td>Pneumonia and other lung infections</td>
<td>6.25</td>
<td>-11.36***</td>
<td>-10.11***</td>
<td>-10,286,330</td>
</tr>
<tr>
<td>Acute pulmonary edema and respiratory failure without ventilation</td>
<td>7.90</td>
<td>-6.20**</td>
<td>-10.39**</td>
<td>-4,739,899</td>
</tr>
<tr>
<td>Postoperative hemorrhage and hematoma*</td>
<td>14.74</td>
<td>-10.99***</td>
<td>-14.79**</td>
<td>-4,154,100</td>
</tr>
<tr>
<td>Infections due to central venous catheters</td>
<td>0.67</td>
<td>-19.40***</td>
<td>-11.11*</td>
<td>-2,664,025</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>3.82</td>
<td>-14.92***</td>
<td>-20.31***</td>
<td>-2,636,381</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>3.02</td>
<td>-14.57***</td>
<td>-10.85***</td>
<td>-2,332,140</td>
</tr>
<tr>
<td>Complications of peripheral vascular catheters and infections</td>
<td>0.73</td>
<td>-27.40***</td>
<td>-15.09*</td>
<td>-2,127,790</td>
</tr>
<tr>
<td>Inflammation and other complications of devices, implants, or grafts*</td>
<td>1.88</td>
<td>-11.70**</td>
<td>-9.64**</td>
<td>-1,956,314</td>
</tr>
<tr>
<td>Moderate infections</td>
<td>1.04</td>
<td>-12.50**</td>
<td>-18.68**</td>
<td>-1,626,652</td>
</tr>
<tr>
<td>Other surgical complications, moderate</td>
<td>2.31</td>
<td>-17.75***</td>
<td>-15.79**</td>
<td>-1,600,776</td>
</tr>
<tr>
<td>Peripheral vascular complications</td>
<td>0.51</td>
<td>-21.57***</td>
<td>-22.50***</td>
<td>-1,402,443</td>
</tr>
</tbody>
</table>

Sources: Maryland Health Services Cost Review Commission Inpatient Discharge Data Set and 3M Potentially Preventable Complications Grouping Software. Notes: The exhibit shows potentially preventable complications (PPCs) with significant changes in both years, in order of highest cost savings to lowest. For a complete list of PPCs, see the Appendix (Note 8 in text). Rates are risk-adjusted using All Patient Refined Diagnosis Related Groups (Note 13 in text) and severity-of-illness categories. Cost estimates are based on added cost of each PPC using linear regression analysis of charges in each year. FY is state fiscal year. Without hemorrhage control procedure or incision and drainage procedure. *Except vascular infection. †Except venous thrombosis. ‡p < 0.10 **p < 0.05 ***p < 0.01

Discussion
Maryland’s Quality-Based Reimbursement Program and hospital-acquired conditions pay-for-performance initiative preliminarily demonstrate that the application of consistent and clear financial incentives can promote hospital care quality in addition to improving efficiency. In both cases, the declaration by CMS that it planned to implement pay-for-performance programs nationally helped overcome providers’ resistance to change. These improvements, however, are not fully attributable to programs alone. What remains to be seen is whether efficiency gains and improved outcomes resulting from pay-for-performance will be sufficient to offset the additional costs associated with implementing such initiatives. The answer is likely to depend on how programs are designed and administered. One clear lesson from Maryland’s experience is that sustained improvements in hospital care quality will require commitment to long-term change management strategies. This includes training providers and hospital staff on best practices, developing mechanisms for ongoing performance monitoring, and establishing a culture of continuous quality improvement. These strategies are essential if hospitals are to achieve the increased performance levels required to sustain reductions in infection-related complications and other potentially preventable events.

Trends In Infection-Related And Other Potentially Preventable Complications (PPCs) In Maryland Hospitals, State Fiscal Years 2009-11

<table>
<thead>
<tr>
<th>Complication</th>
<th>Complication rate</th>
<th>Change (%) FY 2009-11</th>
<th>Number of PPCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>All PPCs</td>
<td>2.38</td>
<td>15.26****</td>
<td>64</td>
</tr>
<tr>
<td>Included PPCs</td>
<td>2.44</td>
<td>-18.59****</td>
<td>49</td>
</tr>
<tr>
<td>Infection-related PPCs</td>
<td>3.33</td>
<td>-27.83****</td>
<td>11</td>
</tr>
<tr>
<td>All other included PPCs</td>
<td>2.18</td>
<td>-14.33****</td>
<td>38</td>
</tr>
<tr>
<td>Excluded PPCs</td>
<td>2.13</td>
<td>2.76</td>
<td>15</td>
</tr>
</tbody>
</table>

Sources: Maryland Health Services Cost Review Commission Inpatient Discharge Data Set and 3M Potentially Preventable Complications Grouping Software. Notes: Complication rate is the number of PPCs per 1,000 people at risk. Rates are risk-adjusted using All Patient Refined Diagnosis Related Groups (Note 13 in text) and severity-of-illness categories. "Included" is included in Maryland’s hospital-acquired conditions program. FY is state fiscal year. ****p < 0.001
Hospitals may have reallocated limited resources away from other quality assurance efforts to focus on selected process measures for marginal gains.

reluctance to establish similar programs in Maryland.

As noted, Maryland has benefited from both the flexibility afforded the state per its waiver from Medicare and Medicaid payment policies and its responsibility to be responsive to the national policy objectives and priorities of the Medicare program. The state’s Health Services Cost Review Commission used this flexibility, along with its ability to be more responsive to the concerns and issues of local stakeholders, to develop equitable, effective, and innovative payment structures.

State-initiated payment innovations and insurance reforms, such as those targeting prospective payment, diagnosis-related groups, and small-group insurance reforms, have positively influenced federal policy in the past.17 Thus, the relationship between Maryland and Medicare could be characterized as a positive symbiotic relationship, in which the federal government establishes broad requirements and priorities but allows the state to create innovative programs to address the needs and concerns of the local community. Although the all-payer rate setting structure is unique to Maryland, the results of the state’s pay-for-performance initiatives and their methodologies can be used by Medicare in future iterations of its programs and extended to both private payers and Medicaid programs.

Maryland’s decision to start with evidence-based process measures seemed appropriate at the time, given that these measures were generally accepted by both the research and provider communities and that these measures did not require more sophisticated and sometimes controversial risk-adjustment methodologies. The commission decided on a conservative approach, applying only modest rewards and penalties through its revenue-neutral, yet competitive, reward and penalty methodology.

Although there were some operational and political advantages to starting with process measures, the commission staff has since generated a number of substantive concerns over the effectiveness of the program. First, the focus on promoting the use of a set of process measures appears to be a highly prescriptive approach to improving quality and requires extensive preparatory work to define the appropriate measure list. More important, the literature analyzing the link between selected process measures and patient outcomes provides mixed evidence that these measures result in improvements in patient outcomes.16–22

Moreover, hospitals may have reallocated limited resources away from other quality assurance efforts to focus on selected process measures for marginal gains, as most measures are provided to more than 95 percent of patients by a majority of hospitals. The four areas of clinical focus—heart attack, heart failure, pneumonia, and surgical infection prevention—cover relatively narrow domains of hospital services.

To focus quality improvement efforts on patient outcomes, the commission moved expeditiously to create a hospital-acquired conditions program that applied to most hospital lines of service and included a broad array of conditions. In our experience, this approach also created an infrastructure and a language that allows for productive evaluation and communication across clinical, financial, and medical coding personnel within a hospital and is oriented toward systematically reducing complication rates over time. The consistency and the strength of the incentives applied, which were progressively increased each year, provided compelling reasons for hospital personnel to engage in these communications and coordinate activities to reduce their rates of complications over time.

Maryland’s hospital-acquired conditions program includes more hospital-acquired condition categories than the related current CMS policy. However, it can be classified as a more conservative approach than the CMS policy because the definitions of potentially preventable complications contain many clinical exclusions, and the performance benchmark is a statewide average. Some complication counts exclude certain complications that were determined to be redundant or a natural consequence of a diagnosis present on admission, and therefore not preventable. In addition, certain admission diagnoses—such as transplants, HIV, neonatal anomalies, major trauma, and patients who are younger than twenty-nine days old—were excluded from a determination of any potentially
preventable complication. The clinical determination of which conditions to exclude was reviewed by the commission staff and 3M based on input from clinical personnel who were members of the state’s hospital-acquired conditions working group. The inclusive and deliberative process established by the commission that included payer and hospital financial and clinical staff proved to be a key element in the final acceptance of the state’s hospital-acquired conditions methodology.

Similarly, broad acceptance of the commission’s risk-adjustment methodology also helped ease adoption. Hospitals initially voiced a concern that the program to reduce hospital-acquired conditions imposed large costs without additional financial assistance from the state. In addition, because diagnosis-related group payment levels for each patient are influenced by the presence of complications, hospitals were worried that all reductions in complications would result in commensurate payment declines.

According to the commission’s unpublished analysis, under the commission’s payment methodology, payments to hospitals were reduced only about 40 percent of the time when complications were eliminated. Thus, 60 percent of the time, hospital diagnosis-related group revenue remained the same. However, the hospital’s resource costs underneath the diagnosis-related group payment were reduced because the preventable complication was avoided. When combined with the potential to generate pay-for-performance rewards, hospitals have the opportunity to earn very positive returns, while the state can reduce expenditures on hospital care.

Conclusion
Although state-based all-payer rate setting programs have been effective in controlling the growth in hospital costs per case, the literature is mixed on how rate setting affects quality of care. Yet just as rate-setting systems have been effective in structuring incentives to improve operating efficiency per case, they can also be effective in the same way around quality performance.

Rate-setting systems, or consistent and coordinated efforts by public and private payers, can provide a more powerful mechanism to promote systematic quality improvement because the incentives applied are consistent and can be applied in a progressively stronger fashion over time. Different payer populations—commercial, Medicaid, and uninsured—often have different health care needs and priorities. Therefore, any coordinated effort by public and private payers would need to include a broad set of quality measures.

Maryland’s Quality-Based Reimbursement Program and hospital-acquired conditions initiative were developed and implemented separately, which allowed us to evaluate the impact of these programs separately. Although we found evidence of improvement in process-of-care measures, we did not find clear evidence that Maryland improved faster than the nation. However, the reductions in hospital-acquired conditions experienced by Maryland hospitals provides some evidence that the employment of consistent and powerful financial incentives can motivate considerable and focused efforts to improve hospital outcomes.

Despite some observed success in the Maryland pay-for-performance initiatives, a number of questions remain unanswered because of a lack of rigorous evaluation and longer-term monitoring of their impact. Maryland is likely to shift emphasis to patient experience and outcome measures, such as mortality, and readmissions. However, more efforts will be needed to rigorously evaluate broad-based pay-for-performance initiatives in the future.

Given the need to move Maryland’s payment systems toward more population-based structures, such as accountable care organizations, broader portfolios of quality measurement must be developed to more effectively measure the health of larger geographic patient groups and to ensure that quality of care improves as they respond to the incentives of more fixed price and global budget payment arrangements.

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NOTES


3 Ryan AM, Nallamothu BK, Dimick JB. Medicare’s public reporting initiative on hospital quality had modest or no impact on mortality from three key conditions. Health Aff (Millwood). 2012;31(11):2125–33.

4 Reinhardt UE. The many different prices paid to providers and the flawed theory of cost shifting: is it time for a more rational all-payer system? Health Aff (Millwood). 2011;30(11):2125–33.

5 Although the Centers for Medicare and Medicaid Services announced that it would implement the value-based purchasing initiative in federal fiscal year 2009, this program was expanded and implemented in federal fiscal year 2012.


8 To access the Appendix, click on the Appendix link in the box to the right of the article online.


11 Michael Pine and Associates was contracted by the Health Services Cost Review Commission to review the present on admission coding in the state hospitals.

12 Because the Health Services Cost Review Commission regulates a uniform markup between cost and charges, Maryland hospital charges directly reflect reported costs and thus can be used to estimate the incremental costs or resource use of each potentially preventable complication.


17 Maryland was the first state to use diagnosis-related groups in a prospective payment system for hospitals, and its experience was used (along with that of the New Jersey all-payer diagnosis-related group system) when Medicare designed its inpatient prospective payment system in 1983.


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In this month’s Health Affairs, Sule Calikoglu and coauthors describe the results of two pay-for-performance programs that Maryland, a state with an all-payer rate-setting system for hospitals, put in place in recent years in advance of similar programs created in Medicare. The programs produced improved results on process-of-care measures; meanwhile, hospital-acquired conditions in the state declined by 15.26 percent over two years and yielded estimated cost savings over that period of $110.9 million. The authors observe that the programs gave hospitals the opportunity to earn very positive returns, while demonstrating at the same time that the state could reduce expenditures on hospital care.

All of the authors are currently or were previously affiliated with the Maryland Health Services Cost Review Commission (HSCRC). HSCRC is an independent state agency with responsibilities for public disclosure of hospital data and operating performance and for establishing hospital rates to promote cost containment, access to care, equity, financial stability, and hospital accountability.

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