Hospitals have been merging with and acquiring nearby facilities, creating local and regional chains that potentially wield greater bargaining leverage than do stand-alone facilities.¹ Concerns over the potential impact of health reform on hospital consolidation and pricing have been raised recently in Massachusetts and California, where hospital mergers and large hospital systems have been associated with high costs of care.

Market consolidation is gaining new attention as a result of two provisions in the 2010 health reform legislation. The expansion of coverage is to be financed in part via a slowdown in Medicare payment rate updates relative to predicted trends, which may lead to further increases in the prices charged by hospitals to private insurers where those hospitals have pricing leverage.² The consolidation of local markets may also be accelerated by the provisions of the legislation that encourage hospitals and physicians in local markets to integrate and form “accountable care organizations” (ACOs) that provide the full spectrum of inpatient and outpatient services.³

This Issue Brief is a shortened version of an article published in the American Journal of Managed Care (“Hospital Market Concentration, Pricing, and Profitability in Orthopedic Surgery and Interventional Cardiology.” 2011 Jun 1;17(6 Spec No.):e241-8).
It is unclear whether integration with physicians gives hospitals more pricing power over and above what they achieve through integration with other nearby hospitals, but the Department of Justice (DOJ) and the Federal Trade Commission (FTC) have raised concerns about this ongoing process.4

DATA AND METHODS
Studies of hospital market concentration and pricing commonly have been plagued by two deficiencies in the available data. First, most studies are unable adequately to account for differences across hospitals in the case mix of the patients treated, and so cannot be sure that observed differences in prices do not simply reflect unobserved differences in severity of illness and intensity of care. Second, most studies lack information on the chain affiliation of individual hospitals and hence, when constructing measures of market concentration, implicitly must assume that every facility is independent and competing with every other, when in fact, many may belong to the same chain and cooperate rather than complete with nearby chain affiliates.

This study avoids these two problems by using data on individual patients undergoing any of six major inpatient procedures, thereby avoiding differences across hospitals in the prevalence of particular procedures and conditions. Additional information was available on the demographics, co-morbidities, and complications of each individual patient. Information was also available to focus on the chain ownership of each hospital, thereby allowing the measurement of local market structure to focus on competition among hospital systems rather than assume hospitals in the same chain compete with one another as well as with non-chain hospitals.

Data were obtained on 11,330 patients admitted to 61 hospitals in 2008 for coronary angioplasty with drug-eluting stent (DES), insertion of cardiac rhythm management (CRM) device (pacemaker or implantable cardioverter defibrillator), total knee replacement, total hip replacement, lumbar spine fusion, or cervical spine fusion.

The market for each hospital was identified as the Hospital Referral Region, developed by the Dartmouth Atlas based on patient flow data for Medicare patients.3 The Dartmouth Atlas assigns every hospital in the United States to one of 306 markets. The 61 hospitals used in this study are distributed across 27 of those markets, spanning 8 states.

These markets varied substantially in terms of the number of hospitals within them, from a low of 2 to a high of 92, with an average of 15.6. Many of these individual hospitals within particular markets belonged to the same hospital chains and so were not competing with one another on the
basis of price. When chain ownership was taken into account, the number of competitors ranged from a low of 2 to a high of 54, with a mean of 11.3. The six procedures studied here are all performed on an inpatient rather than outpatient basis, so the relevant measure of market structure is that of the hospital rather than including, for instance, the presence of ambulatory surgery centers.

Prices charged by the hospitals were measured in terms of the amount collected from the private insurer for each patient, after all contractual discounts. Collected revenues per patient are a more valid indicator of true prices than are the hospital’s billed charges, which typically never are collected in full. Rather than focus on the overall profitability of the hospital, which also is influenced by case mix differences, this study analyzed the profitability to the hospital of each patient, in terms of the difference between the insurer’s payment and the hospital’s direct costs for that patient. This “contribution margin” measures the profitability of each particular patient exclusive of indirect hospital costs such as administrative overhead, depreciation of capital investments, and the charity care provided to uninsured patients.

To examine the bivariate association between market structure and hospital performance, hospitals were divided according to whether their index of market concentration was above or below the median for all study hospitals, and average prices and contribution margins for patients undergoing each of the six procedures were calculated. We then conducted multivariate regression analyses of hospital prices and contribution margins as a function of market structure and size, procedure volume (number of study procedures performed in the hospital during 2008), hospital characteristics (number of staffed beds, teaching status, average staff salary), and patient characteristics (principal diagnoses, age, 

Table 1. Procedure-Specific Prices and Contribution Margins for Commercially Insured Patients in Consolidated and Competitive Hospital Markets

<table>
<thead>
<tr>
<th>Type of Market</th>
<th>Angioplasty</th>
<th>CRM Device Insertion*</th>
<th>Knee Replacement</th>
<th>Hip Replacement</th>
<th>Lumbar Fusion</th>
<th>Cervical Fusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price (Insurance Payment)</td>
<td>$32,411</td>
<td>$47,477</td>
<td>$26,713</td>
<td>$29,140</td>
<td>$51,998</td>
<td>$23,755</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$20,173</td>
<td>$23,872</td>
<td>$14,614</td>
<td>$16,412</td>
<td>$28,101</td>
<td>$11,711</td>
</tr>
<tr>
<td>% Contribution Margin</td>
<td>62%</td>
<td>50%</td>
<td>55%</td>
<td>56%</td>
<td>54%</td>
<td>49%</td>
</tr>
<tr>
<td>Competitive Markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price (Insurance Payment)</td>
<td>$21,626</td>
<td>$30,399</td>
<td>$18,337</td>
<td>$19,534</td>
<td>$39,568</td>
<td>$18,370</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$10,612</td>
<td>$11,056</td>
<td>$6,467</td>
<td>$7,050</td>
<td>$14,411</td>
<td>$7,150</td>
</tr>
<tr>
<td>% Contribution Margin</td>
<td>49%</td>
<td>36%</td>
<td>35%</td>
<td>36%</td>
<td>36%</td>
<td>39%</td>
</tr>
</tbody>
</table>

*CRM indicates cardiac rhythm management.
comorbidities, complications, discharge destination). The multivariate regression analyses produced findings similar to the bivariate analysis of prices and profitability according to whether the hospitals were in local markets with a concentration level above or below the median for all hospitals, and so this Issue Brief highlights the easier-to-interpret bivariate findings.

RESULTS
The association between hospital market concentration on the one hand, and the prices charged and contribution margins earned on the other, is presented in Table 1. The average price per procedure is significantly higher in concentrated than in competitive markets for all six procedures. The average difference in contribution margins earned in concentrated markets compared with competitive markets was $9,561 (90%) for angioplasty, $12,816 (116%) for CRM device insertion, $8,147 (126%) for knee replacement, $9,362 (133%) for hip replacement, $13,690 (95%) for lumbar fusion, and $4,561 (64%) for cervical fusion.

It is interesting to note that these procedures generated positive contribution margins even in competitive markets where hospitals’ pricing leverage is weak. As indicated in Table 1, the average contribution margins for patients treated in competitive hospital markets was 49% for angioplasty, 36% for CRM insertion, 35% for knee replacement, 36% for hip replacement, 36% for lumbar fusion, and 39% for cervical fusion.

The associations between market structure, pricing, and contribution margins do not adjust for other hospital and patient characteristics that are likely to influence how much a hospital is able to charge and earn from a particular procedure. The multivariate statistical analyses that do control for these factors found similar associations, however. Hospital prices for patients in concentrated markets were higher than hospital prices for otherwise comparable patients in competitive markets by 25.1% for angioplasty, 13.0% for CRM device insertion, 19.2% for total knee replacement, 24.1% for total hip replacement, 19.3% for lumbar fusion, and 22.7% for cervical spine fusion.

CONCLUSION
Hospitals need revenues to finance operating expenses, to invest in new capacity, and to provide charity care for the uninsured, yet they receive payments from public insurance plans that lag behind the growth in the costs of care. Positive contribution margins on orthopedic and cardiac procedures for privately insured patients can be used to subsidize less remunerative procedures and patient groups. The average total margin for U.S. hospitals in 2008 was 2.8%, according to American Hospital Association data, indicating the extent to which the double-digit contribution margins documented here are used to support other services. The extent to which the margins documented here are too high, too low, or just right depends on the mandates placed on hospitals by public policy, private litigation, and cultural expectations.

Public policy has been ambivalent with respect to the consolidation of hospital markets. Anti-trust regulatory agencies tend to see mergers as socially undesirable and have sought to block many. On the other hand, the 2010 Patient Protection and Affordable Care Act contains provisions encouraging the formation of “accountable care organizations” that would encourage hospitals and physicians to combine into larger entities capable of managing the full continuum of care. Hospitals traditionally have funded charity care and other socially desirable
activities by charging high prices to and earning high profits from commercially insured patients. While understandable given the lack of near-term alternatives, this indirect approach to funding desirable activities rewards hospitals for forestalling competition rather than for improving the efficiency of the care they provide. As argued by MedPAC, high commercial insurance prices and profits may reduce pressures on hospitals to control costs, thereby accelerating the cycle of higher payments leading to higher costs, and then a subsequent need for even higher payments. Prices should reflect the value of the hospital services offered, not the consolidation of the local hospital market.

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