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Specialty Hospital Evaluation

Final Report

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SPECIALTY HOSPITAL EVALUATION

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SECTION 1
INTRODUCTION & MAJOR FINDINGS

This report by staff with the Research Triangle Institute (RTI) was funded by the Centers for Medicare & Medicaid Services in response to a Congressional mandate to evaluate the performance and impacts of physician-owned specialty hospitals. The study began in early September, 2004, with the major analytic sections completed by the end of February, 2005, and provided input to CMS' Report to Congress (CMS, 2005) on the topic.

1.1 Congressional Mandate

Section 507 of the Medicare Prescription Drug, Improvement, & Modernization Act of 2003 (MMA Public Law 108-173) established an 18-month moratorium on expansion and referrals to physician-owned specialty hospitals opened after November 18, 2003. During the interim, two studies were required: one by MedPAC, and one by HHS/CMS analyses of three types of physician-owned specialty hospitals over the fall and winter of 2004-05: cardiac, orthopedic, and surgical. The GAO (2003a,b) had already completed a study for the Congress that described the location, specialty mix, and services of specialty hospitals. MedPAC was assigned responsibilities to determine (MedPAC, 2005):

- whether certain DRGs emphasized by specialty hospitals were more profitable
- whether specialty hospitals were selecting less severe, more profitable patients within those DRGs
- whether specialty hospitals were more or less costly in treating Medicare patients
- whether specialty hospitals were unnecessarily increasing the per capita utilization of costly procedures in their local markets.

Congress assigned to HHS/CMS the following complementary analyses:

- Determine the percentage of patients admitted to physician-owned specialty hospitals who are referred by physician owners
- Determine the referral patterns of physician owners including the frequency with which they admitted to their own facility versus other local hospitals
- Compare the quality of care in physician-owned specialty hospitals with quality in other local full-service community hospitals for similar conditions
- Determine patient satisfaction with care received in specialty versus full-service community hospitals
- Assess differences in uncompensated care between specialty and other local community hospitals and the relative value of the tax exemption available to non-profit hospitals.

1.2 Overview of RTI's Study Approach

1.2.1 Four-pronged Approach

With only 6 months to complete all of the analyses required by the Congress, the results reported here are naturally somewhat limited and preliminary. In consultation with CMS research staff, we adopted a four-pronged approach.

1. First, we conducted a "national" study of all physician-owned specialty hospitals and their competitors with a minimum number of Medicare discharges in 2003. This study was based strictly on Medicare claims.
2. The second effort was a qualitative set of site visits to 11 specialty hospitals and 21 competitors in six cities: Tucson, Dayton, Hot Springs, Fresno, Rapid City, and Oklahoma City. Qualitative interviews were supplemented with focused claims analyses in each area.
3. The third, qualitative, study involved two sets of focus groups of patients discharged from specialty and competitor hospitals in three of the six cities. These groups were in lieu of a formal survey of Medicare patients, which was not feasible within the Congressional timeframe.
4. Fourth, we conducted comparative financial analyses of uncompensated care and tax exemptions between specialty hospitals and their non-profit competitors in the six cities.

These four major activities involved the following key steps.

1.2.2 Identifying Specialty Hospitals & Competitors

First, RTI, with CMS assistance, had to identify the universe of specialty hospitals. No national, official, list of specialty hospitals exists—especially of hospitals focusing on the three categories identified by the Congress. Moreover, not all specialty hospitals involve physician ownership. We assembled our own list from several sources including:

- GAO (2003a, 2003b) studies
- American Surgical Hospital Association membership
- American Federation of Hospital membership
- MedCath membership
- National Surgical Hospital membership
- Medicare's Provider of Service (POS) file.

The POS file was screened for key words in the hospital's title such as "cardiac," "specialty," "heart," "orthopedic," "surgical," and "physician." From these sources, we identified 105 hospitals in operation as of mid-2004 that might be physician-owned hospitals in one of the three specialties of Congressional interest.

To screen out hospitals without physician ownership, not in operation, or not in the specialty of interest, we conducted a search of hospital websites, made inquiries of local media and trade publications, and, in several cases, called the hospital. When MedPAC's final list came available, we also added any hospitals we may have missed. This process eliminated 13 hospitals, leaving 92 physician-owned specialty hospitals potentially eligible for analysis.

Because we had complete calendar year Medicare claims only as recent as 2003, we limited the sample further to specialty hospitals with at least 15 discharges in certain Major Diagnostic Groups as of this year. This eliminated another 17 "low 2003 volume" specialty hospitals, leaving a final sample of 75 physician-owned specialty hospitals (compared with the 48 MedPAC hospitals analyzed using 2001/02 data).

To qualify as a physician-owned cardiac specialty hospital, a provider had to have at least 5 Medicare discharges involving a major procedure (e.g., bypass, angioplasty) and at least 45 percent of cases in MDC 5, Circulatory Disorders. Similarly, an orthopedic specialty hospital had to have 5 major orthopedic surgical procedures (e.g., hip replacement) as well as 45 percent of discharges in MDC 8, Musculoskeletal Disorders. Failing these two criteria, a surgical specialty hospital had to be physician-owned with at least 45 percent surgical discharges.

For each of these hospitals, we identified a group of peer competitors within 20 miles of each specialty hospital that had the same minimum volume characteristics (e.g., at least 15 MDC 5 discharges; 5 major cardiac procedures; 45% MDC 5 discharges).

1.2.3 Site Visits

In consultation with CMS staff, we identified six cities (see above) that had a mix of the three types of specialty hospitals (4 cardiac; 5 orthopedic; 2 surgical). Each city had to have at least one specialty hospital in operation in the city for two years. We strived for geographic diversity, although very few specialty hospitals have been in operation for two years east of the Mississippi River. A research team interviewed hospital management, physician owners and non-owners, nurses, and technical staff in the 11 specialty hospitals about finances, referrals, treatment patterns, services, quality assurance procedures, staffing, and local competition. Shorter in-person visits were made to two or more local competitors except for Rapid City that had only one local community hospital. During the visits, quantitative information also was collected on hospital finances, volume trends, and physician ownership shares.

1.2.4 Medicare claims

We assembled a claims database for each specialty hospital and their local competitors for the years CY1998 through CY2003. Due to time constraints, we concentrated most of the claims analyses on the most current year, 2003, although we did conduct a trend analysis of changing market shares between 1998 and 2003. We also used the claims along with AHRQ software to compare quality of care provided between specialty and competitor hospitals.

To isolate the referral patterns of physician owners, with the help of our CMS Project Officer, we first collected UPIN identifiers for each physician owner in the 11 specialty hospitals in six cities. (It was infeasible to collect UPIN information from all physician owners in 75

specialty hospitals in such a short timeframe.) We then linked physician owner IDs to claims. This allowed us to track where they were referring Medicare patients.

Using the claims file, we conducted both a "national" and "six city" study of referral patterns and case-mix severity of specialty versus competitor hospitals. For the national analysis, we had 30,700 MDC 5 discharges from 18 cardiac specialty hospitals in CY2003 and 153,721 competitor discharges; 6,700 MDC 8 discharges from 40 orthopedic specialty hospitals and 100,529 discharges from peer competitors; and 495 discharges in major MDCs from 12 surgical hospitals and 4,185 discharges from 31 competitors. We also conducted an analysis of the impacts on market shares in cities where a specialty hospital had opened between 1998 and 2003.

1.2.5 Focus Groups

Eight focus groups were conducted in three geographically diverse cities: Dayton, Fresno, and Oklahoma City. Three focus groups involved 30 Medicare patients recently discharged from a cardiac specialty hospital. Another two groups had 17 patients discharged from an orthopedic specialty hospital. The remaining three comparison groups involved 29 patients discharged from local competitors in the three cities. Participants were queried about their inpatient experiences regarding the hospital's environment, care from nurses and doctors, their general experience as an inpatient, and their overall rating of their care.

1.2.6 Financial Statements & Taxes

Uncompensated care costs were derived from financial statements provided by the specialty hospitals we visited, supplemented by IRS Form 990s submitted annually by all non-profit hospital providers. (Medicare Cost Report Worksheet S-10 uncompensated data, available for the first time in 2003, proved unreliable.) Several imputation procedures were required to value the tax exemptions of non-profit providers and are described in Section 7 of the report.

1.3 Major Study Findings

1.3.1 Ownership in Specialty Hospitals

Physician ownership percentages, in aggregate, varied systematically by type of specialty hospital. Physicians in the four cardiac specialty hospitals owned 38 percent of the hospital, on average, compared with 78 percent average physician ownership in the seven orthopedic and surgical hospitals as a group. The number of individual physician owners varied markedly from a low of 8 in one smaller orthopedic specialty hospital to nearly 100 in a large orthopedic facility. According to interviews with physicians and hospital managers, the sheer size of the capital investment necessitates a substantial number of physician investors in many specialty hospitals. Consequently, the average shareholding of any one physician is quite small. Among the four cardiac specialty hospitals, the maximum single physician ownership share was about 10 percent in one facility with the vast majority owning 1 percent or less. Maximum shareholdings by individual physicians were somewhat higher in the smaller, less capital intensive orthopedic and surgical specialty hospitals. One physician owned 22.5 percent of the hospital while another owned slightly over 10 percent.

Besides physician ownership, other ownership entities include (a) local acute general hospitals, and (b) outside corporate organizations. Nearly one-half of the specialty hospitals we visited had a partnership arrangement with a local hospital. Four of the five acute general hospital partners played a major role in capitalizing the specialty hospital while a fifth bought into the specialty hospital after it was operational. From their shareholdings, it is clear that all acute general hospital partners had a considerable amount financially at stake in their specialty partners. Nearly one-half of specialty hospitals also tapped corporate investment outside the local community.

The direct financial incentives to a physician owner from referring patients to their own facility are generally quite small because their inpatient contribution to aggregate profits is small. We estimate that the direct enhancement of income from referrals likely adds 1-3 percent to the physician owner's total billed income from patient care. Ownership returns on a physician's share from a profitable hospital are considerably greater but are not linked to their own referrals. Ultimately, if the hospital is profitable, physician owners can enjoy substantial financial gains through the sale of their stock, which occurred in one orthopedic facility.

1.3.2 Specialization

Based on our national dataset, physician-owned facilities are highly specialized as expected. Over 4-in-5 Medicare patients discharged from cardiac specialty hospitals were in MDC 5, Circulatory Disorders. A similar percentage of patients in MDC 8, Musculoskeletal Disorders, were discharged from orthopedic specialty hospitals. Of Medicare patients discharged in MDC 5 from cardiac specialty hospitals, 7-in-10 were in surgical DRGs, leaving a significant percentage discharged in the medical heart DRGs (e.g., heart attacks, congestive heart failure). By contrast, practically all MDC 8 patients discharged from orthopedic specialty hospitals had undergone surgery. Surgical hospitals had a surgical orientation between that of cardiac and orthopedic hospitals.

The degree of specialization raises clinical and policy issues. First, it has long been recognized that patient outcomes are better in facilities with higher volumes for a particular procedure. The federal government, when establishing DRG payment, anticipated that hospitals under cost pressures would become more specialized in the care they did best. Concentration in key, high-risk procedures has been viewed in a positive light by policy makers and would speak in support of specialty hospitals in general.

Second, specialization manifests itself along a continuum with no obvious cut-off point. Judgment arises in what is an "inappropriate" level of specialization warranting a prohibition on physician ownership. In our research, we have followed MedPAC's lead in using 45% as a threshold defining "specialized," but this level is not currently grounded in any theoretical or empirical concept of what constitutes "adverse," or "unfair" referral patterns. We cannot say at what point physician ownership becomes a public policy issue in a hospital that specializes in certain types of cases.

Third, specialization in our study was classified, not only across service lines-of-business, but by patient severity within DRG and by type of payer as well. From the public debate on the topic, severity and payer issues appear to dominate concerns over how specialized are physician-

owned facilities. No concerns have been raised as yet over the few physician-owned women's hospitals, for example.

1.3.3 Referral Patterns

Our study of referral patterns involved a combination of national and six-city analyses. Results are presented by topic area.

"National" Hospital-level Severity Rates. Using a large sample of specialty and competitor hospitals in 2003, we calculated an overall facility severity rate based on the proportion of Medicare discharges classified as major or extreme in 3M's APR-DRG system. As shown below in ***Table 1-1***, all three types of specialty hospitals discharged lower percentages of major/extreme cases than their local peer competitors.

Table 1-1
Average Medicare severity rates by type of specialty hospital versus competitors

Type (no. hospitals)	Percent Major/extreme Severity[1]	Decomposition of severity: Within-DRG Index[2]	Decomposition of severity: Cross-DRG Index[3]
Cardiac (MDC 5)			
• Specialty (18)	23.3%*	.85*	.94*
• Competitor (98)	29.5	1.00	1.00
Orthopedic (MDC8)			
• Specialty (40)	6.3%*	.36*	.71*
• Competitor (189)	22.9	1.00	1.00
Surgical[4]			
• Specialty (12)	8.1%*	--	--
• Competitor (31)	18.0%	--	--

NOTES:
[1] Percent of discharges classified major/extreme in APR-DRG system.
[2] Ratio of hospital's actual-to-expected severity rate.
[3] Ratio of hospital's expected (case-mix)-to-overall group severity rate.
[4] Eight most frequent DRGs. Too few observations allowed a meaningful decomposition of surgical hospital severity.
*Significant at 5% level compared with competitors.

SOURCE: 2003 Medicare IPPS claims.

Cardiac specialty severity rates were one-fifth lower than their local peer competitors. Surgical specialty hospital severity rates were slightly less than one-half that of competitors. Orthopedic specialty severity rates were only about one-quarter those of competitors. Within-DRG patient severity in cardiac specialty hospitals averaged only 85 percent of their competitor's rate while their overall DRG case-mix severity rate was 94 percent of their competitors' rate. Hence, roughly two-thirds of the overall severity difference between cardiac specialty and competitor hospitals is explained by the selection of heart patients they are treating within DRGs while one-third is explained by the kinds of DRGs they focus on that involve somewhat less severe cases on average. A similar contribution of within-DRG versus case-mix differences is found for orthopedic specialty hospitals, only on a much lower average severity level. Too few observations were available to decompose severity rates for surgical specialty hospitals.

Considerable variation exists in severity rates among competitor hospitals, but cardiac specialty hospitals exhibited lower severity rates for cardiac patients compared to the average in nearly all of the markets they were in as of 2003. (Dayton Heart Hospital was a notable exception.) Part of the explanation is their focus on elective surgical procedures and part is due to referring fewer patients with significant co-morbid illnesses to surgery in their facility.

Physician Ownership & Severity. Physician ownership is positively related to the likelihood of referring patients to the specialty hospital (***Table 1-2***).

Table 1-2
Physician ownership and Medicare referral rates to specialty hospitals in six cities[1]

Hospital Type/ MD ownership	MD Owner (%)	Proportion of MD owners referring more than half their cases to specialty hospital
Cardiac		
<.5%	33%	1-in-10 owners
.5–1.0%	32	1-in-2
>1.0%	35	1-in-2
Orthopedic		
<1%	41%	1-in-14
1-5%	39	1-in-5
>5%	19	4-in-5
Surgical		
<1%	22%	0-in-7
1-5%	56	1-in-5
>5%	22	1-in-2.3

NOTES: [1]Based on ownership data in Tucson, Fresno, Hot Springs, Oklahoma City, Rapid City, and Dayton.

SOURCE: Ownership information provided by specialty hospitals; referral rates based on 2003 Medicare IPPS claims.

For example, only 1-in-10 cardiac owners with shares less than one-half of one percent referred over 50 percent of their cases to their own specialty hospital. By contrast, 1-in-2 physician owners with greater than a 1 percent share referred over one-half of their patients to their own hospital. The relationship was similar for owners of surgical specialty hospitals but somewhat stronger for owners of orthopedic specialty hospitals. It is important to note that most physician owners have very small shares in their specialty hospital and, possibly as a consequence, make few referrals to the facility. Case study interviews revealed that many local physicians invested in the specialty hospital either out of a personal relationship with the major physician owners or to assure that they could refer patients to the facility if need be. A physician's inclination to refer to the specialty hospital is relatively unaffected at low ownership levels, and majority of physician owners refer few patients to their specialty hospital.

With ownership information available for only 11 specialty hospitals, one must be careful in generalizing any link between physician ownership and the referral rate for severely ill patients. ***Table 1-3*** shows the results for

Table 1-3
Severity rate[1] of referrals by physician ownership in four cities: cardiac specialty versus competitor hospitals

City	MD Non-Owners		MD Owners	
	Specialty	Competitors	Specialty	Competitors
Dayton	41.9%*	29.9%	37.8%*	29.9%
Oklahoma City	20.4*	27.0	21.7*	25.6
Tucson	24.2	27.9	18.4	21.3

NOTES: [1]Percents in table are major/extreme rates of cases referred by an ownership category to either specialty or competitor hospitals.
*Significant at 1% level compared with competitors.

cardiac specialty hospitals in three cities. (The Fresno Heart Hospital was in operation only two months in CY2003 and was excluded.) In Dayton, both non-owners and owners referred a higher percent of severely ill patients to the cardiac specialty hospital. In Oklahoma City and Tucson, the trend was reversed, but only differences in Oklahoma City were significant. The Oklahoma Heart Hospital also has a financial partnership arrangement with full-service Mercy Hospital next door which treats many heart patients with serious comorbid illness. From this small sample, it appears that facility characteristics rather than ownership *per se* determine the severity of patients referred to cardiac specialty hospitals. This is evidenced by the fact that severity referral patterns are similar for both physician owners and non-owners. Dayton also was unusual in its high referral rate of severely ill patients to its facility.

Table 1-4 shows a more consistent pattern of less severely ill orthopedic patients referred to specialty hospitals, but, again, the pattern is consistent for both non-owners and owners. (Very few physician non-owners referred any patients to the specialty hospital in Rapid City and their rates are unreliable.) Too few observations were available to test for percent-of-ownership effects on severity of referrals.

Table 1-4
Severity rate[1] of referrals by physician ownership in three cities: orthopedic specialty versus competitor hospitals

City	MD Non-Owners		MD Owners	
	Specialty	Competitors	Specialty	Competitors
Fresno	1.2%*	26.5%	10.1%*	19.6%
Oklahoma City	4.5*	20.3	2.6*	21.1
Rapid City	37.5	33.1	8.6*	22.5

NOTES: [1]Percents in table are major/extreme rates of cases referred by an ownership category to either specialty or competitor hospitals.
*Significant at 1% level compared with competitors.

SOURCE: Ownership provided by specialty hospitals; severity based on Medicare IPPS claims, 2003.

Transfers. In contrast to other referral analyses, all transfers to any another cardiac, orthopedic, or surgical competitor hospital within 20 miles were counted to gain a complete picture of local transfer patterns. No differences were found in transfer-out rates for cardiac specialty versus other competitor facilities in their markets. Both cardiac specialty and other acute hospitals transferred about 1-in-100 MDC 5 discharges to another hospital in their market. Transfer-in rates to cardiac specialty hospitals were nearly double those for other acute hospitals. This is likely due to their concentration in elective heart surgery while many other local hospitals do not emphasize the service. Cardiac specialty hospitals transferred a slightly higher percentage of major/extremely ill heart patients (43 percent) compared with other acute hospitals (38 percent). Other acute hospitals, however, also transferred substantial numbers of severely ill patients both among themselves as well as to the specialty hospital. Other local acute hospitals, in addition to specialty hospitals, may not be capable of caring properly for such sick patients.

MDC 8 transfer-out rates of orthopedic specialty hospitals was nearly triple the rate of competitor hospitals, albeit the rate is still relatively low: 1.7 percent versus 0.6 percent. Transfer-in rates were identical which is likely explained by the fact that practically all local acute hospitals perform elective orthopedic surgery. In contrast to the cardiac hospitals, orthopedic specialty hospitals had a much lower transfer rate of major/extreme patients. This is partially attributed to the small number of such cases that they admit in the first instance.

Emergency Departments & Severity. Many fewer cases were admitted through the emergency department in orthopedic and surgical specialty hospitals compared with their competitors. This contributes to their generally lower inpatient severity rate. Cardiac hospitals, because of the emergency nature of illness, generally operate larger, full staffed emergency rooms. We learned in our site visits that states grant hospitals wide latitude in the size and staffing of emergency rooms. We also found that many physician owners routinely "took call" in competitors' emergency rooms. This arrangement was mutually convenient. The general acute hospital usually depended upon the clinical expertise of physician owners in competing specialty hospitals to care for their emergencies while owners often needed the extra cases to fill their caseloads, financially.

1.3.4 Quality of Care

We analyzed quality of care in three domains: (1) mortality; (2) complications; and (3) readmissions. We also tracked discharge disposition as a possible indicator of patient health status upon discharge. In addition, we interviewed numerous clinical staff from specialty hospitals and medical directors and a few physicians in local competitor hospitals.

Mortality. Risk-adjusted, condition-specific mortality rates using AHRQ software were constructed, both inpatient and 30-days post-discharge. Rates were stratified by major versus minor surgery within moderate versus severely ill groups. In another analysis, we compared mortality within several high-risk cardiac procedures. (Mortality rates were too low for procedure-specific orthopedic and surgery stratifications.) Risk-adjusted inpatient and 30-day mortality rates for cardiac specialty hospitals were consistently below those of competitors (***Table 1-5***). This is true not only among moderately severe patients that dominate the case mix of specialty hospitals, but among severely ill patients as well.

Table 1-5
Inpatient and 30–day mortality: Cardiac versus competitor hospitals

Severity Level	Mortality Rates			
	Inpatient		30–day	
	Specialty	Competitor	Specialty	Competitor
Overall	1.98%*	3.46%	3.81%*	6.71%
• Moderate[1]	0.41*	0.79	1.33*	2.99
• Severe[2]	7.50*	10.32	12.60*	17.10
Procedure/ Condition	Observed/expected[3] inpatient mortality			
	Specialty		Competitor	
AAA Repair	0.78		0.75	
CABG	0.79		0.86	
PTCA	0.71		0.96	
Carotid Endarterectomy	0.57		1.22	
CHF	0.41		0.59	
AMI	0.69		0.87	

NOTES: [1]APR-DRG severity levels 1 and 2 averaged over all MDC 5 discharges.
[2]APR-DRG severity levels 3 and 4 averaged over all MDC 5 discharges.
[3]AHRQ risk-adjusted software for expected mortality. Ratio <1.0 imply lower-than-national average mortality.
*Significant at 1% level compared with competitors.
SOURCE: 2003 Medicare IPPS claims.

Except for AAA repair rates which are comparable, the remaining five complex surgeries or conditions favor cardiac specialty hospitals. Observed inpatient mortality is less than expected, nationally, for both groups, as evidenced by ratios less than 1.0. Specialty ratios are generally even lower than among competitor hospitals. While any one or two ratios are not indicative of a mortality difference, the pattern across 6 important procedures/conditions is consistent with better outcomes in specialty hospitals.

Inpatient and 30-day mortality rates for both orthopedic and surgical hospitals were lower than for their local competitors (***Table 1-6***). This was true within severity group as well.

Table 1-6
Inpatient and 30–day mortality: Orthopedic and surgical hospitals versus competitor hospitals

	Mortality Rates					
	Inpatient				30–day	
	Specialty		Competitor		Specialty	Competitor
Severity Level	N[4]	Rate	N[4]	Rate		
Orthopedic (MDC8)						
Overall	6,018	0.03%*	88,226	1.25%	0.17%*	3.95%
Moderate[1]	5,647	0.00*	68,735	0.34	0.12*	2.00
Severe[2]	371	0.53*	19,491	4.45	1.08*	10.82
Surgical (MDC8,12,13)	483	0.00*	3,946	0.53	0.21*	1.67
Moderate[1]	444	0.00*	3,244	0.06	0.23	0.71
Severe[2]	39	0.00*	702	2.90	0.00*	6.13

NOTES: [1]APR-DRG severity levels 1 and 2 averaged over all MDC 8, or 8, 12, 13 discharges.
[2]APR-DRG severity levels 3 and 4 averaged over all MDC 8, or 8, 12, 13 discharges.
[3]AHRQ risk-adjusted software for expected mortality. Ratio <1.0 imply lower-than-national average mortality.
[4] N = number of discharges.
*Significant at 1% level compared with competitors.
SOURCE: 2003 Medicare IPPS claims.

Complications. Complications were identified and risk adjusted using AHRQ Patient Safety Indicator software. Fourteen indicators were analyzed based on observed versus expected ratios. Ratios less than 1.0 imply that the hospital group's rate of complications was below the rate based on all U.S. hospitals. Expected complication rates for each hospital are based on age-sex national frequency rates times the hospital's own case-mix frequency. Cardiac specialty hospitals had lower-than-expected ratios for 11-of-14 indicators while their competitors were lower on 6-of-14 indicators (***Table 1-7***).

Table 1-7
Observed versus expected complication rates per 1,000 discharges[1]: cardiac and orthopedic specialty versus competitor hospitals

	Cardiac (MDC 5)		Orthopedic (MDC 8)	
Complication	Specialty	Competitor	Specialty	Competitor
Anesthesia	0.11	0.08	0.40	0.38
Death in low mortality DRG	0.90	1.22	0.00	1.56
Decubitis ulcer	0.64	0.91	0.47	1.10
Failure to rescue	0.57	0.86	0.29	0.73
Foreign body left	0.79	0.99	0.00	1.08
Iatrogenic pneumothorax	1.83	2.38	0.00	0.59
Selected infections	0.56	1.33	0.00	1.35
Post hip fracture	0.57	1.37	--	--
Post-op hemorrhage/hematoma	0.35	0.68	1.71	1.57
Post-op physiologic/metabolic derangements	1.32	2.49	0.00	0.19
Post-op pulmonary embolism/DVT	0.53	0.93	0.52	1.24
Post-op septis	0.67	1.03	0.09	0.66
Post-op wound dehiscence	0.00	1.47	--	--
Accidental puncture/laceration	1.27	1.32	1.65	1.77
Post-op respiratory failure	--	--	0.21	1.40
Transfusion reaction	--	--	0.00	0.00

NOTES: [1]Expected rates based on age–sex categories. Ratios <1.0 imply lower-than-national average complication rate and higher quality.

SOURCE: 2003 Medicare IPPS claims; AHRQ patient safety indicator risk–adjusted software.

Cardiac specialty hospitals also had lower observed/expected ratios than their competitors for 13-of-14 indicators. Orthopedic specialty hospitals had lower-than-expected ratios for 13-of-14 indicators versus 6-of-14 indicators for their local competitors. Orthopedic specialty hospitals were also lower than their competitors on 13-of-14 patient safety indicators. Too few discharges were available from surgical hospitals to calculate meaningful risk-adjusted complications ratios.

30-day Readmission Rates. Readmission rates can be another indicator of quality if patients are discharged too soon and must be readmitted to another acute hospital within 30 days. To avoid counting readmissions unrelated to the initial reason for admission, we considered only a subset of complications-oriented readmissions. 30-day readmission rates for cardiac specialty hospitals exceeded those of their competitors: 8.91 percent versus 7.73 percent for competitors. Higher cardiac specialty readmission rates also were found by severity and major and minor surgery grouping. All differences were statistically significant at 5 percent level.

Readmission rates for orthopedic specialty hospitals, by contrast, were actually lower than for their competitors: 1.73 percent versus 3.53 percent for competitors. This was true within

severity and major/minor grouping as well. Readmission rates were too low in surgical hospitals for a meaningful comparison using just 2003 discharges.

Discharge Disposition. Both cardiac and orthopedic specialty hospitals were more likely to discharge patients to home than were their competitors within moderate and severe illnesses groups. Both types of competitors were more likely to discharge patients to inpatient rehabilitation and skilled nursing facilities.

Quality Assurance. Several specialty hospitals we visited were not accredited by JCAHO. (Medicare does not require JCAHO accreditation.) A few were seeking accreditation as they had been opened a relatively short time. Most were conducting patient safety projects to meet accreditation and a few showed us data on their ten quality indicators collected by CMS. QA directors noted that physician owners were quite involved in tracking patient quality and welcomed support staff to bring quality issues to their peer review meetings. Several specialty hospitals had electronic physician order entry as part of their initial facility construction.

Physician & Technical Support. Limitations of a smaller specialty hospital did create potential quality issues. Some specialty hospitals we visited lacked a pharmacist on the premises at night and nurses sometimes had to dispense medicines. The pharmacist would check their dispensing in the morning. While cardiac specialty hospitals always had a physician on the premises 24 hours a day—usually in the emergency room, most orthopedic and surgical hospitals only had physicians remotely on call at night. In cases of emergency, nurses initiated cardiopulmonary resuscitation and called 911 for emergency paramedics as well as the physician on call.

Another concern was the lack of medical specialists on staff at specialty hospitals. Some facilities had contracted with hospital list groups to provide medical backup and consultations. Yet, the focus on elective surgery, especially in orthopedic and surgical specialty hospitals, required triaging medically compromised patients to local full-service hospitals for surgery.

1.3.5 Patient Satisfaction with Care

Patient focus groups addressed several issues related to perceived quality and satisfaction with the care they received.

Nursing Services. Over all, Medicare beneficiaries were effusive about the nursing care they had received in the specialty hospital. Most reported that nurses were extremely attentive and one participant said that

> *"they were always there [and that one] never had to ring for a nurse [because they] just came by frequently to check."*

Patients did not notice any effects of the nursing shortage during their specialty hospital stay because of the low patient-to-nurse staffing ratio. Patients appreciated the all-RN staffing and dedication.

> *"You didn't always get an aide or something like that; your nurse was available."*

By contrast in a community hospital one beneficiary remarked that

> *"I absolutely had to wait for a nurse…They came in only three times a day."*

Many beneficiaries seemed hesitant to criticize the nursing staff in community hospitals and felt that the nurses could not be held responsible for the long wait times in their rooms. Nurses, they felt, work with lots of difficult patients and "do a good job of it."

Beneficiaries also commented on the high level of knowledge and specialized skills of nursing staff in the specialty hospitals. Some compared their experience to being in the ICU at the community hospital.

> *"They made me feel comfortable…it's scary when you are going in [for surgery] but they had me ready…they talked to me [and] they explained the procedure."*

> *"I felt like the nurses were trained in [their] specific area, and therefore we didn't have to do as much explaining to them about what we felt was going on with our bodies."*

Beneficiaries treated in community hospitals noted that the ICU physician and nursing staff worked well as a team; something that did not seem to carry over as much on the routine floors.

Hospital Amenities. Beneficiaries from specialty hospitals were also impressed with how quiet and convenient the facility was.

> *"Because the staff needed to handle [the patient caseload] is smaller,…they are in contact with everybody without having to have phones or [loud] PA systems."*

All specialty hospitals had only private rooms which patients greatly appreciated. They felt it made recovery easier.

> *"The privacy and the size of the room makes all the difference in the world. If you go to [another hospital] it's in a semi-private room; they have to move everything you have on your side of the bed to get to the other bed to close the curtain." "I could actually sleep."*

Similarly, a beneficiary discharged from a community hospital did remark that

> *"when you are in a double room,…and the two patients are on different schedules for medicines or their tests…you might wake up 4-5 times during the night…but there's nothing you can do about it. I guess that's expected."*

Family members in some specialty hospitals were encouraged to stay in the large single room with their relative, which was appreciated as well. Beneficiaries were not generally dissatisfied with the level of inconvenience during their stay in the community hospital, but that it was the expected norm.

Complications. While most focus group beneficiaries believed complications were the exception, interviewees in both groups noted problems with care. In a specialty hospital, one patient reported problems with catheters.

> *"They put a stent in…it got twisted or blocked; got to the point where I couldn't even walk."*

Others noted problems with drawing blood using nurses instead of phlebotomists. The hospital realized the problem through analysis of their discharge satisfaction surveys and enhanced nurse training in drawing blood.

Beneficiaries in community hospitals also reported complications such as *"catching pneumonia"* while hospitalized or being *"discharged with strep throat."* Another was discharged with blood in his catheter that was supposed to *"go away,"* but he eventually had to be readmitted for care by a urologist.

Physician Ownership. Beneficiaries voiced three reasons why they felt physician ownership was a benefit to them: (1) doctors take pride in their hospital and want to provide the "best product they can"; (2) doctors have a choice who they hire and the rules, policies, and procedures used in their facilities; and (3) doctors have a focus on patient care.

> *"The doctors all take pride…in their ownership. If they run something, they want it to be the best."*

> *"I think they care more because their name's on it…they own it…It's just normal that they would put more into it."*

One beneficiary's warned that

> *"[when] the doc that started it [left]…the doctors who move in might be more oriented toward making money."*

1.3.6 Uncompensated Care & Community Benefits

Using financial statements provided by 10 of 11 specialty hospitals we visited, supplemented by IRS Form 990s that non-profit hospitals must submit for tax purposes, we were able to determine the amount of uncompensated and charity care provided by specialty and competitor hospitals. Excluding Medicare and Medicaid subsidies for indigent care, as well as any "losses" from treating these publicly insured patients, the average uncompensated burden of the 21 non-for-profit competitors was approximately 2.5 percent of total operating revenues (***Table 1-8***). Specialty hospitals as a group exhibited a lower uncompensated care burden of about 1 percent.

Table 1-8
Net community benefits as a percentage of total operating revenues

		Not-for-Profit (NFP) competitor hospitals		
	Specialty hospitals	All NFPs	In cities with public hospitals	In cities without public hospitals
Number of facilities	10	21	10	11
Total uncompensated care costs[1]	0.97%	2.48%	1.66%	3.19%
Total tax payments[2]	4.55%	--	--	--
Total net community benefit	5.52%	2.48%	1.66%	3.19%

NOTES: [1]Excludes Medicare DSH and Medicaid "losses" and public subsidies. 50% of bad debts excluded as unrelated to indigent care.
[2]Federal corporate and physician income taxes, state income taxes, sales and property taxes.
SOURCE: RTI International analysis of voluntary financial data submissions from specialty hospitals and IRS Form 990 submissions by NFPs.

Corporate profit and individual physician income tax payments to the federal government go to support Medicare and Medicaid payments while state taxes support Medicaid and local indigent care. This is why taxes are considered as a community benefit in lieu of substantial uncompensated care. Non-profit competitors do not pay these taxes in general and are expected to provide more care to the uninsured. Taxes paid by the specialty hospitals averaged 4.5 percent so that their total uncompensated care and tax burden was 5.5 percent of operating revenue. This burden was slightly more than double the rate incurred by not-for-profit hospitals. The tax burden of orthopedic and surgical specialty hospitals exceeded 7 percent due to their higher profits. Cardiac specialty hospital profit rates were much lower.

A sharp distinction should be made for non-profit hospitals operating in cities without a public hospital because they will have to absorb much more of the uninsured indigent care. Eleven non-profit hospitals in cities without a public hospital incurred double the uncompensated care burden (3.2 percent versus 1.7 percent) of those in cities with a public hospital. Nevertheless, the average burden for NFP hospitals without a local public hospital was still well below that incurred by specialty hospitals due to the taxes they pay.

We also valued the tax exemption enjoyed by non-profit competitor hospitals. Based on their (relatively low) operating income, we estimate their total tax exemption (including the value of unpaid sales and property taxes) to be approximately 2.9 percent of operating revenue. This 2.9 percent figure exceeds their average uncompensated care burden of 2.5 percent. Thus, federal, state, and local governments provide an implicit subsidy to these providers that more than compensates for their uncompensated care burden.

1.3.7 Impacts on Market Shares

The number of specialty hospitals has increased over 4-fold from 1998 through the middle of 2004 (***Table 1-9***). By mid-2004, 92 were open and seeing patients in 58 different markets in the United States. Orthopedic specialty hospitals were the first to open with 13 in operation in 1998 and rising to 43 by 2004. Many previously were Ambulatory Surgery Centers (ASCs) that added a few inpatient beds at relatively low cost. Since 1998, the number of physician-owned cardiac facilities has increased more than 6-fold from three to 20. Surgical hospitals not focusing strictly in cardiac or orthopedic care have also grown rapidly. In addition, there were 17 physician-owned specialty hospitals that had opened in 2004 but had insufficient volumes to be classified.

Table 1-9
Growth in number and Medicare market share of specialty hospitals, 1998-2004

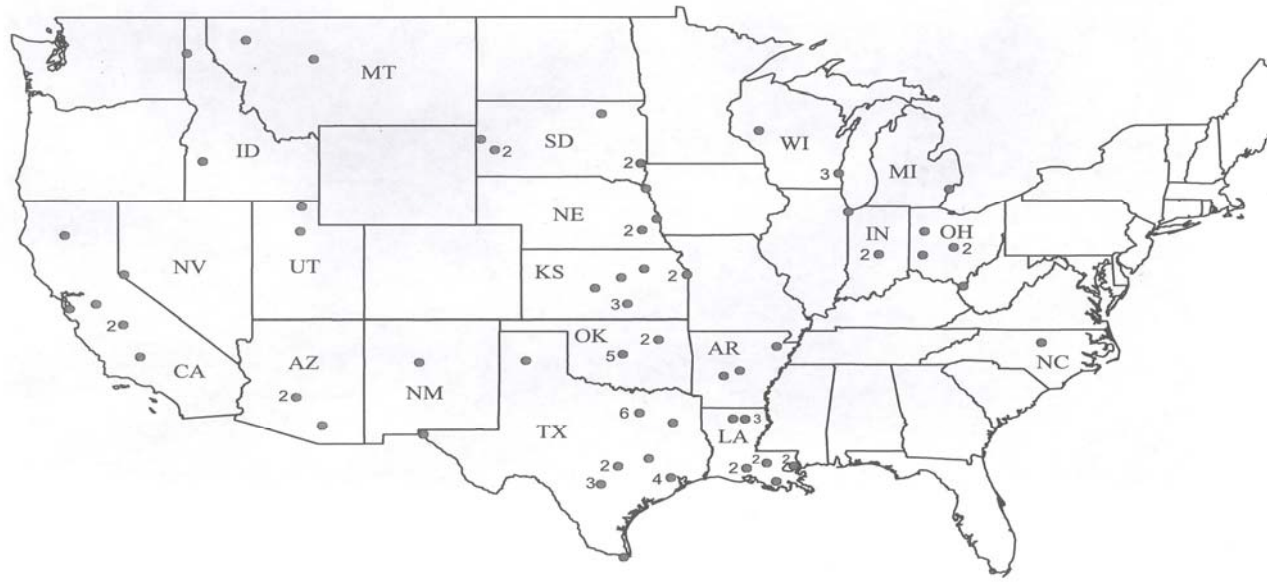
	1998	2001	2003	2004
Number of specialty hospitals/markets	**21/17**	**45/36**	**84/56**	**92/58**
Cardiac	3	9	18	20
Orthopedic	13	22	40	43
Surgical	1	6	12	12
Low volume	4	8	14	17
Specialty Medicare market share				
Cardiac (all MDC5)	2.6%	--	16.6%	--
• Surgery	3.9	--	24.5	--
Orthopedic (MDC8)	1.6	--	6.2	--
• Surgery	2.0	--	737	--

NOTES:
SOURCE: Medicare IPPS claims, 1998-2003; 2004: hospital websites, association membership lists, Medicare claims.

Specialty hospital market shares increased commensurate with their numbers. By 2003, cardiac specialty hospitals were responsible for nearly 17 percent of Medicare patients (1-in-6) discharged in MDC 5 in the markets they had entered. These hospitals discharged 1-in-4 cardiac patients undergoing surgery in their markets. By 2003, they were the largest heart hospital in 7 of 12 markets where they had been open a full year. Orthopedic specialty hospitals, because they have many fewer inpatient beds, have not become nearly the dominant force in most markets. By 2003, they were responsible for only 6.2 percent of Medicare MDC 8 patients discharged in their markets (1-in-16 patients) and only a slightly higher percent of surgical patients. Their inpatient volume averaged only one-third that of their local full-service competitors.

Market Characteristics. As shown in ***Figure 1-1***, specialty hospitals almost always locate in faster growing markets without state Certificate-of-Need regulations.

Figure 1-1



Note: Each facility is indicated by a red circle. In areas where there are multiple facilities in close proximity, the number of facilities is indicated adjacent to the symbol.

Consequently, rapid population growth and demand for hospital services attenuates the volume impacts on other local hospitals. Cardiac hospitals tend to locate in mid-sized and larger markets given their costly nature and larger markets required to support their services. Even though cardiac specialty hospitals accounted for 85 percent of the growth in cardiac admissions in their markets over the 1998-2003 period, most other competitors also continued to expand their volumes. Orthopedic and surgical specialty hospitals can and do enter small-sized markets because they are much less reliant on inpatient care. Consequently, their spillover volume impacts on other local competitors can be considerable in small markets, not only in terms of diverted patients but in the concentrated nature of referrals back to them from the specialty hospital. We were not able to evaluate the positive competitive impacts specialty hospitals may have had by entering small markets previously monopolized by a community hospital. In one case, however, the single not-for-profit community hospital was averaging 12-14 percent total

margins before the specialty hospital entered the market in a significant way. Margins declined to 2 percent as profitable cases shifted to the local specialty facility.

Distribution of Major/Extreme Cases. As cardiac specialty hospitals enter and gain market share, they take on an increasing percentage of the market's major/extremely complex cases (20-30 percent in 2003 in 13 markets). This is true even though they admit a smaller percent of such cases than their competitors. Presumably, by taking such complex cases at all, they relieve local hospitals of the financial burden for these costly cases. When orthopedic specialty hospitals locate in small markets (e.g., Hot Springs and Rapid City), they were also found to take on a reasonable percentage of all major/extreme orthopedic cases. The high costs of these patients offset to a limited extent the profits specialty hospitals make on less severe patients that they treat. We also found that orthopedic specialty hospitals formed three fairly distinct groups: (1) spine surgery; (2) hip/knee surgery; and (3) hip/knee with other general surgery. As a rough rule, the more concentrated the specialty hospital, the more profitable it was with a lower percentage of major/extreme cases.

Safety Net Provider Impacts. In Oklahoma City, the safety net provider (defined as having either a public indigent care contract and/or a large uninsured patient share) lost significant cardiac volume to the new cardiac specialty hospital after its for-profit management entity rejected a partnership arrangement with its large cardiology group. In Fresno, the safety net provider entered a partnership arrangement with its cardiology group and funded most of the building of the specialty hospital; yet, the safety net partner continues to offer major heart surgery at its own facility. The safety net provider in Tucson maintained that it was not affected at all (its volume remained strong) while in Dayton, the two major competitors lost both volume and market share. Orthopedic hospitals tend to have much less impact on safety net providers except in very small cities such as Rapid City.

Partnership Arrangements. None of the four cardiac specialty hospitals that we visited had more than 49 percent physician ownership because of the tens of millions of dollars required to build a new facility. Three of four of cardiac hospitals had a local non-profit partner. Because orthopedic and surgical hospitals involve much smaller capital investments, only 1-in-7 had a local hospital partner. Arrangements between specialty and local full-service hospitals complicate the analysis of both market shares and referral patterns. As the local community partner shifts services to the specialty hospital, competitor market shares appear to fall even though at least one local NFP hospital is sharing in any profits from the opening of the specialty hospital. Specialty-community partnerships appeared to be voluntary in a couple of instances where the community hospital saw competitive advantages to joining forces with a cardiology group that had previously been dedicated to another competitor hospital. In at least two instances, however, the non-profit partner had entered the arrangement primarily to avoid losing substantial volume.

1.4 Policy Implications of Findings

1.4.1 Specialty Hospitals and Competition

From our research, we find that cardiac specialty hospitals in general, and particularly orthopedic specialty hospitals in small markets, heightened local competition for patients. Every

market where we identified a specialty hospital had at least one local competitor. Given the short-run nature of our evaluation, we were not able to evaluate the long-run viability of specialty hospitals or the competitive responses of community hospitals, but it is clear that not all entrants have been successful.

One can view the specialty hospital as simply another form of on-going, vigorous service competition among hospitals. Not-for-profit, hospital-based, cardiac and orthopedic "centers of excellence" have flourished in the last 15 years as a natural competitive strategy of community hospitals. Industry competition has been further invigorated by the rapid expansion of local Ambulatory Surgery Centers—sometimes 15 or more in a medium-sized city. ASCs, as a group, have taken substantial, and lucrative, business away from community hospitals, who have responded by supporting physicians on their medical staff in establishing some ASCs.

State and local governments, in sunsetting Certificate of Need regulations, have looked favorably upon these competitive trends. By allowing providers to open and expand specialized services, patients have more local providers to choose from, insurers gain leverage in bargaining with large community hospitals, and quality competition is promoted. Careful consideration of the positive gains to heightened competition has been the general approach of both public policy makers and anti-trust regulators.

1.4.2 Specialty Hospitals' "Unfair Competitive Advantage"

We do find a positive, but relatively weak, relationship between physician ownership and referrals to specialty hospitals. Most physician owners have only a tangential involvement with their specialty hospital and continue to refer patients in large numbers to community hospitals. For a few physicians more heavily invested in their own facility, they do have "ownership" incentives to refer patients there instead of to other local providers. It is also true that their outside investors and lenders looked favorably on their having an "ownership stake." Referral incentives to owners are indirect, however. Based on interviews with specialty hospital physicians and managers, disbursements of earnings (positive and negative) were based solely on the physician's percent ownership of stock.

Physician owners, we discovered, have far from absolute control over where their patients are admitted. Our case studies revealed three constraints on their referral patterns:

1. Managed care contracts that commit patients to local community hospitals
2. Emergency patients still admitted primarily to community hospitals—often by physician owners "taking call" in these hospitals
3. Patient location and preferences for community hospitals.

Moreover, from our investigations, community hospitals appear to have responded vigorously to local competition and the entry of specialty hospitals in most markets by:

- Purchasing "feeder" primary care practices committed to sending patients to their facility

- Negotiating exclusive managed care contracts with insurers

- Prohibiting medical staff from referring patients to specialty hospitals—known as "economic credentialing"

- Providing lucrative "management" sub-contracts with inpatient specialists in lieu of actual ownership stakes

- Investing in ambulatory surgery centers with physician ownership along with their medical staff.

Any disadvantage that not-for-profit hospitals face from being prohibited in offering their physician staff an "ownership stake," while real, has been diminished somewhat through alternative financial arrangements. All community hospitals seek ways to "recruit and tie" physicians to their facility.

1.4.3 Specialty Hospitals and Favorable Patient Selection

We found that most specialty (and especially orthopedic and surgical) hospitals admit less sick patients for care. This is partly due to operating smaller emergency departments and partly to the kinds of procedures they specialize in. But even within procedures and diagnostic groups, specialty hospitals see less sick patients. This behavior was not particularly related to physician ownership as non-owners also referred less sick patients to these hospitals. From these observations, we conclude that the absence of a broad set of medical services, including neurology, trauma, urology, and cancer, along with limited medical specialists on staff and on site, necessitates referrals of medically compromised patients to full-service hospitals.

It seems logical to ascribe their narrower service offerings, in fair part, to the dominant specialty of the major physician owners—usually cardiologists and orthopedic surgeons. Specialization takes on three forms. On the most visible level, specialty hospitals concentrate in a few procedure-oriented diagnostic groups: MDC 5, heart disorders; and MDC 8, spine, bone, and joint disorders. Then, at a less obvious level, they further concentrate on surgical DRGs within these two groups. Finally, within a few surgical DRGs, these hospitals "specialize" in elective patients with "manageable" medical conditions.

Why these hospitals specialize in this way is essentially for the same reason that physicians open ambulatory surgery centers. Payment is greater relative to the costs involved in treating these patients. "Overpayments," not necessarily physician ownership, encourages all types of investors to open specialized facilities and "unravel" care from full-service tertiary hospitals.

1.4.5 Specialty Hospitals and Quality/Satisfaction with Care

We find little evidence of lower quality provided in specialty hospitals. All RN staffing, lower patient-to-nurse ratios, high procedure volumes, electronic physician ordering, single rooms, and the latest equipment, all indicated a high level of quality. Fewer inpatient, risk-adjusted, complications and lower 30-day mortality reinforced this conclusion. Higher readmission rates, however, do raise questions requiring further research. We were not able to fully evaluate the more subtle criticism that specialty hospitals inadequately treat complex medical patients who then have to be transferred to "back up" full-service hospitals. Cardiac

specialty hospitals did show a slightly higher transfer rate of very complex patients, although orthopedic hospitals actually had lower rates of such transfers. We also found that other local not-for-profit hospitals also transfer complex patients to tertiary facilities, although they generally do not call themselves "heart" or "orthopedic" specialty hospitals.

Medicare beneficiary satisfaction was demonstrably greater in specialty hospitals as evidenced by numerous comments from our focus groups. Specialization, again, appeared to be a dominant reason, along with many desirable amenities such as single rooms. Physician ownership was believed by beneficiaries to contribute to the positive hospital care and atmosphere. We also believe from our site visits that the young age of the physical plant and generally lower occupancy rates influenced beneficiary opinions. It is likely that the profitability of services provided in specialty hospitals permits physicians and management to spend more on plant and clinical support staff. Prohibiting specialty hospitals with physician ownership from providing care to patients, on net, may compromise quality in the area.

1.4.6 Specialty Hospitals and Community Benefits

Although we find that specialty hospitals, like many proprietary hospitals, provide less uncompensated care than their not-for-profit competitors, they more than make up for the difference in the federal, state, and local taxes they pay. A principal concern of community hospitals has been the loss of profitable patients to specialty hospitals that limits their ability to provide charity care. Existing research and our current analyses do not support the contention that specialty hospitals are the primary reason that not-for-profit hospitals are limited in the care they provide the uninsured. Most not-for-profit hospitals we analyzed had positive operating and total margins. Based on our site visits, we attribute this to the growing cities in which specialty hospitals locate and to the presence of a "safety net" public hospital in some locales to care for the uninsured.

We excluded any Medicaid "discounts" that community hospitals may have incurred on costs from our calculations as well as any government subsidies hospitals received for Medicaid patients. Besides data problems, it was unclear to us how federal and state governments view any "losses" that providers incur on Medicaid patients net of subsidies. It is our understanding that the Medicaid program believes it is paying fairly for such services, in which case, considering "losses" as a community benefit may be misleading. Furthermore, were not-for-profit community hospitals to reclaim lost patients from specialty hospitals, we are not sure how much of the "profits" would be redirected to more charity care.

SECTION 2
ORIGINS OF SPECIALTY HOSPITALS AND IMPLICATIONS FOR EVALUATION

2.1 Historical Antecedents of the Physician-owned Specialty Hospital

To understand the recent, rapid, growth in physician-owned specialty hospitals, an appreciation of the evolution in the acute general hospital industry more generally is required. Specialty hospitals have existed and been recognized as a unique group by the American Hospital Association for decades. Historically, they have been non-profit and have filled specialized, "unprofitable" service niches, e.g., maternity, children's, burns, cancer, psychiatric, rehabilitation. The new variant of specialty hospital is fairly unique in (1) its concentration on certain types of surgery; (2) its for-profit status; and (3) in having some direct physician ownership.

Today's specialty hospital is a "natural" outcome of a competitive hospital industry with unique features that set it apart from other industries. First, the industry is subject to an extraordinarily high rate of technical change that not only has required burgeoning investments in equipment and staff in full-service facilities, but also has enabled physicians to treat patients outside the hospital's walls in outpatient clinics, ambulatory surgery centers, and their offices. This trend has conveyed greater power to the physician in choosing the locus of care for patients. Second, payment system reforms that have shifted financial risk for costly care onto hospitals and have exerted downward pressure on physician fees encourage hospitals and physicians to seek alternative, more profitable, sites of care and to focus on the best paying procedures. Third, insurers such as Medicare usually pay hospitals and physicians separately. The resulting lack of alignment of physician with hospital incentives gives physicians little incentive to practice efficiently in their traditional, non-profit hospital setting.

In this section, we explore the reasons for the growing popularity of specialty hospitals among physicians in more detail. Our intent is to put the results presented in later sections in a broader market context.

2.2 Medicare Hospital DRGs and Managed Care

The acute hospital environment changed drastically when Medicare implemented its per case DRG payment system in 1984. Reinforced by the program's aggressive utilization review organizations, DRG bundled payment resulted in large reductions in inpatient days—especially in facilities with inappropriate admissions and long stays for less complex cases. A wave of closures and mergers of smaller providers occurred during the mid/late 1980s. Per case Medicare payment incentives spurred private insurers to adopt, first, staff model HMOs, then a variety of managed care products in order to control hospital cost shifting resulting from constrained Medicare rates.

Medicare's shift to the per case basis of payment forced hospitals to place much more emphasis on admissions to fill unused beds. Acute hospitals could increase admissions in two ways. First, they could add "big admitter" physicians to their medical staffs. Second, they could broaden their service lines. Both responses were strongly encouraged by private managed care plans in search of local "flagship" acute hospitals to anchor their networks.

The resulting "anti-specialization" trend was not forecasted by the early proponents of DRGs. Most analysts thought that hospitals, given payment signals attached to specific types of patients, would narrow their service mix and concentrate on services in which they enjoyed a comparative advantage, i.e., were more cost effective. An industry dominated by non-profit providers took a different tack, however, by maintaining its public service role and continuing to cross-subsidize losing services. Financial pressures to break even often required a broader, not narrower, set of services in order to admit more patients to cover rising average fixed costs from declining inpatient volumes. Larger, full-service, providers improved their competitive advantage as a result of these trends while smaller hospitals closed or merged.

2.3 Payment Reform Impacts on Physicians

Natural market forces and government payment reforms had dramatic impacts on physicians as well. First, hospital managers responded to increased financial pressures from payers by forcing physicians to practice more efficiently, or at least use the hospital less intensively for patient care. This involved earlier discharges, shorter operating room times, less immediate access to expensive diagnostic equipment. At the same time, Medicare was capping physician fees for specialized procedures such as eye surgery and cardiac angiography, and private insurers were introducing HMOs, PPOs and other ways of exacting deeper fee discounts. The result has been a more hectic inpatient work environment and a less remunerative market for physicians' professional services.

Physicians were far from powerless in responding to pressures exerted by hospitals. Their relationship to hospitals is quite different from other professionals in that they have exclusive legal power over admissions and diagnostic and therapeutic procedures.[1] The hospital is considered by many to be the "doctor's workshop." Physician referral networks also are mainly personal. When surgeons relocate to another local hospital in a mid-sized city, their referral network moves with them. The scarcer are their specialized skills in the local market, the greater the loss in volume in their previous "workshop." Specialists—and particularly surgeons—who are often in short supply in mid-sized and smaller cities and towns enjoy considerable market power vis-à-vis local hospital managers. Managers have a difficult time recruiting and retaining specialists in these locales, further enhancing specialists' command of hospital resources or even to start whole new health care ventures.

2.4 Incentives to Unravel Services

The evolution of payment systems that put greater emphasis upon admissions, coupled with increasing financial pressures on physicians, set the stage for deconstruction, or the unraveling of profitable services. Pervasive inter-service cross-subsidization supported in non-profit providers became increasingly onerous to specialists in strong demand. It also became a "target of opportunity." Physicians disenchanted with their hospitals, or simply new to the area, were encouraged by the payment system to set up their own specialized facilities to maximize their access to hospital resources, patients, and to augment their incomes. Through partial

[1] Accountants and lawyers also have their "clients," but the law firms that employ them generally have contractual arrangements with client companies that do not allow professionals to take clients with them as easily as can physicians who move to another hospital.

ownership, they could gain a financial return on both the physical and labor inputs of the new facility which was impossible in a non-profit community hospital.

Enterprising physicians employed two distinct strategies to gain more autonomy and increase incomes:

1. Enlarge their Ambulatory Surgery Center (ASC); or
2. Co-invest in a new, freestanding specialty hospital.

ASCs are allowed ownership by referring physicians. Many orthopedic/surgery specialty hospitals appear to have evolved from the ASC ownership model by adding inpatient beds and gaining expanded licensing privileges from state boards. Expansion of many ASCs into full-fledged surgical specialty hospitals with (limited) overnight nursing capabilities numerically dominates the for-profit specialty hospital industry. Physician-owned ASCs without inpatient beds continue to compete with full-service hospitals yet remain unconstrained by Congress in referring patients for day surgery. Adding a few inpatient beds further enhances their competitive position by being able to admit more complex cases.

The larger orthopedic and cardiac specialty hospitals are quite different in certain respects. They require much larger capital investments in whole new freestanding facilities dedicated to more complex surgical procedures. Total, or even major, physician ownership at the individual level is not possible, although a group of physicians can own a substantial minority of the entity. Being specialized may give them cost advantages over full-service hospitals that suffer from "diseconomies of scope" arising from having to manage many loosely related services. Compared to physicians referring to non-profit hospitals, physician owners will have additional incentives to "fill beds" in their own hospital. Physicians on non-profit hospital staffs also have incentives to assure that their hospital remains financially viable by referring patients there. Managers have reinforced these incentives in several non-pecuniary ways such as making more operating room time available, hiring more support staff, and buying the latest technologies.

2.5 Implications for Evaluation

Policy makers are now confronted with a very different set of specialty hospitals than heretofore. As a predictable outcome of competition, technology, and reforms in inpatient and physician payment, it is reasonable to expect strong growth in physician-owned specialty hospitals unless the government intervenes directly to prevent their diffusion or indirectly by making them less profitable. Policy makers may decide to prohibit physicians from any ownership stake of any kind of inpatient hospital or, more narrowly, in any part of a "specialized" hospital. They might do so if quality was found to be particularly poor or if local full-service hospitals were found to be at a particular competitive disadvantage. In so doing, potential gains to payers and patients from greater local choice of care would be lost, but overall quality of care might be better. Making them less profitable is an alternative if specialty hospitals were found to have reasonable good quality and not materially harming other local hospitals financially.

SECTION 3
HOSPITAL SAMPLE, CASE STUDY CITIES, AND DATA SOURCES

3.1 Overview

This section provides a summary of the data sources and sampling used to conduct the empirical analyses in this report. In particular, we describe how physician-owned specialty hospitals (SPHs) and their competitors (AGHs) were identified. No national list of specialty hospitals exists, in part, because of the lack of a commonly accepted definition of a "specialty hospital." MedPAC was responsible for producing the list of SPHs, but it was not available until well after the start of this project. Moreover, MedPAC's final list was limited to SPHs in operation in 2001/2002, and we intended to use more recent 2003 Medicare claims data, thereby necessitating a more current list. This component of the industry has been growing rapidly in the last few years, and the Internet proved to be a valuable source of current information.

After identifying the sample of specialty hospitals and their local competitors, this section describes the four sources of data used to answer the key policy questions:

- Case study interviews in six cities.
- Financial and physician-owner information from 11 specialty hospitals.
- Medicare Inpatient PPS claims.
- IRS 990 financial statements on nonprofit AGH competitors.

Besides the sample and data sources, this section introduces a few key analytic variables that structure the evaluation. These include general variables that categorized SPHs and AGHs into the three MMA-identified groups: cardiac, orthopedic, and surgical. We also discuss hospital and patient-specific variables, such as the way transfers are identified. (Many other analytic variables are discussed later in the relevant evaluation sections.)

3.2 Identification of Specialty and Competitor Hospitals

3.2.1 Previous Definitions of Specialty Hospitals

Section 507(a) of the MMA defines specialty hospitals as those "primarily or exclusively engaged in the care and treatment of one of the following categories: (i) patients with a cardiac condition; (ii) patients with an orthopedic condition; (iii) patients receiving a surgical procedure," and any other category deemed to a be a "specialty" and subject to the 18-month hospital building moratorium. Unfortunately, there does not exist a Medicare designation of specialty hospitals (other than certain specialized hospitals, such as childrens or psychiatric). There have been a number of recent studies investigating the effects of "specialty hospitals" (cardiac, orthopedic, and surgical) on other providers, each using a somewhat different definition, as shown in ***Exhibit 3-1***.

Exhibit 3-1
Definitions of "specialty hospitals" used in previous studies

Study	Specialty hospital definition	Specialty types identified
GAO (2003a, 2003b)	• At least two-thirds of inpatient stays are in one or two MDCs; or • At least two-thirds of inpatient stays are in surgical procedure DRGs. • Also, hospitals must have had at least 20 Medicare discharges in 2001.	• Cardiac • Orthopedic • Surgical • Women's
Casalino, Devers, and Brewster (2003)	• Ownership by a large single-specialty (cardiology, cardiothoracic surgery, or orthopedic surgery) physician group	• Cardiac • Orthopedic
MedPAC (2004, ongoing)	• At least 45 percent of discharges in one of the following groups: MDC 5 (Diseases and Disorders of the Circulatory System), MDC 8 (Diseases and Disorders of the Musculoskeletal System and Connective Tissue), or surgical DRGs; or • At least 66 percent of discharges in two of the three groups listed above. • Also, hospitals must have had at least 25 Medicare discharges in 2002.	• Cardiac • Orthopedic • Surgical

These studies also used different numbers of "specialty hospitals" in their analyses. The GAO (2003a, 2003b) studies used Medicare Provider Analysis Review (MedPAR) data from 2001 and Healthcare Cost and Utilization Project (HCUP) inpatient data from 2000 for six states[2] to identify specialty hospitals. The list of hospitals identified through GAO's analysis of these data using the criterion described in Exhibit 3-1 was supplemented by the agency with member lists of the American Surgical Hospital Association (ASHA), the American Federation of Hospitals, National Surgical Hospitals (a chain of surgical and orthopedic hospitals), and MedCath (a chain of cardiac hospitals), resulting in a list of 100 facilities. These 100 facilities were surveyed on, among other things, whether they had any physician-owners, resulting in positive identification of 55 physician-owned specialty hospitals in four specialties: cardiac,

[2] The HCUP data used were from Arizona, California, New Jersey, New York, North Carolina, and Texas. Of the 29 HCUP-participating states, "these [six] states were selected because Medicare data identified them as having potentially large concentrations of specialty hospitals." (GAO, 2003a, p. 30).

orthopedic, surgical, and women's. By comparison, MedPAC identified 48 physician-owned specialty hospitals in three specialties: cardiac (12), orthopedic (25), and surgical (11).

3.2.2 RTI's Definition of Specialty Hospitals

The goal was to identify all such hospitals in existence in 2004 using the *most recently available data,* since, as noted by the earlier studies, the number of specialty hospitals has increased dramatically during the past few years. To this end, we identified physician-owned specialty hospitals in two stages. In the first stage, we identified a set of physician-owned hospitals that were "potential" specialty hospitals. In the second stage, we used Medicare claims data from January through June 2004 to determine the specialization (if any) of the hospitals identified in the first stage.

For the purposes of this study, at the direction of CMS, a "specialty hospital" is defined as a hospital specializing in cardiac, orthopedic, or surgical cases. Other areas of specialization, such as women's hospitals, were excluded because they were not mentioned in the MMA. The following stages operationalize these three categories.

Stage 1: Identifying a Set of Physician-Owned Specialty Hospitals

Because of the need to quickly begin recruiting specialty hospitals for the six site visits conducted for this study, Medicare claims data could not used to identify the set of physician-owned specialty hospitals.[3] Identifying physician-owned specialty hospitals was performed in a multi-step process:

1. A combined list of known specialty hospitals was created from facilities that are members of the ASHA, MedCath, and National Surgical Hospitals, Inc.

2. A list of additional hospitals was generated by searching the Provider of Services File (POS), updated to the third quarter of 2004, for hospitals with names containing keywords we felt were indicative of a specialty hospital, including: "specialty," "heart," "orthopedic," "orthopaedic," "surgical," and "physician." Not-for-profit and government-owned hospitals were excluded from this list. A total of 105 hospitals were identified in these first two steps.

3. Once this combined list of potential physician-owned specialty hospitals was created, their ownership type (physician or not) and likely specialty were determined. This process was usually performed by telephone calls to the hospitals and Internet searches of the hospital, local media, and trade publication web sites. Evidence of physician ownership was documented and likely specialty was ascertained (in many cases, it was difficult at this point to distinguish orthopedic and surgical hospitals; however, in either case, they would be considered specialty hospitals for this study).

[3] Requests from the CMS Data Extract System (DESY) for claims from the National Claims History (NCH) Nearline Files or the Inpatient 100% Standard Analytic Files can often require extended periods of time to complete (six to eight weeks is not uncommon). The information necessary for site visit recruitment did not need to come from claims data, so many of the steps needed to identify all physician-owned specialty hospitals were completed prior to the submission of any DESY request.

Women's, long-term acute, rehab, and hospitals later discovered not to be specialty hospitals were excluded, as were hospitals in which physician ownership could not be determined. This process eliminated 13 hospitals.

The result of completing Stage 1 was a final count of 92 positively identified physician-owned specialty hospitals operational in late 2004 (see ***Exhibit 3-2***).

Stage 2: Determining Hospitals' Specialties Using 2004 Medicare Claims Data

Next, the 92 hospitals identified in Stage 1 as being physician-owned and "probable" specialty hospitals were categorized into the three specialty groups, as well as hospitals that in fact were not specialty hospitals or had insufficient Medicare volume to make a proper specialty determination. Because the definition of each specialty type is somewhat arbitrary, we constructed *three variants of the specialty definition*: two based on our classification of cases by diagnosis, with differing case-mix thresholds for defining specialties; and one identical to the MedPAC definitions.

In contrast to previous GAO and MedPAC studies that use only MDCs and a surgical versus medical DRG distinction, we divided the heart and orthopedic MDCs (5 and 8, respectively) into categories based on the intensities of the procedures. ***Exhibit 3-3*** shows the division of **MDC 5 (cardiovascular disorders)** into three subclasses:

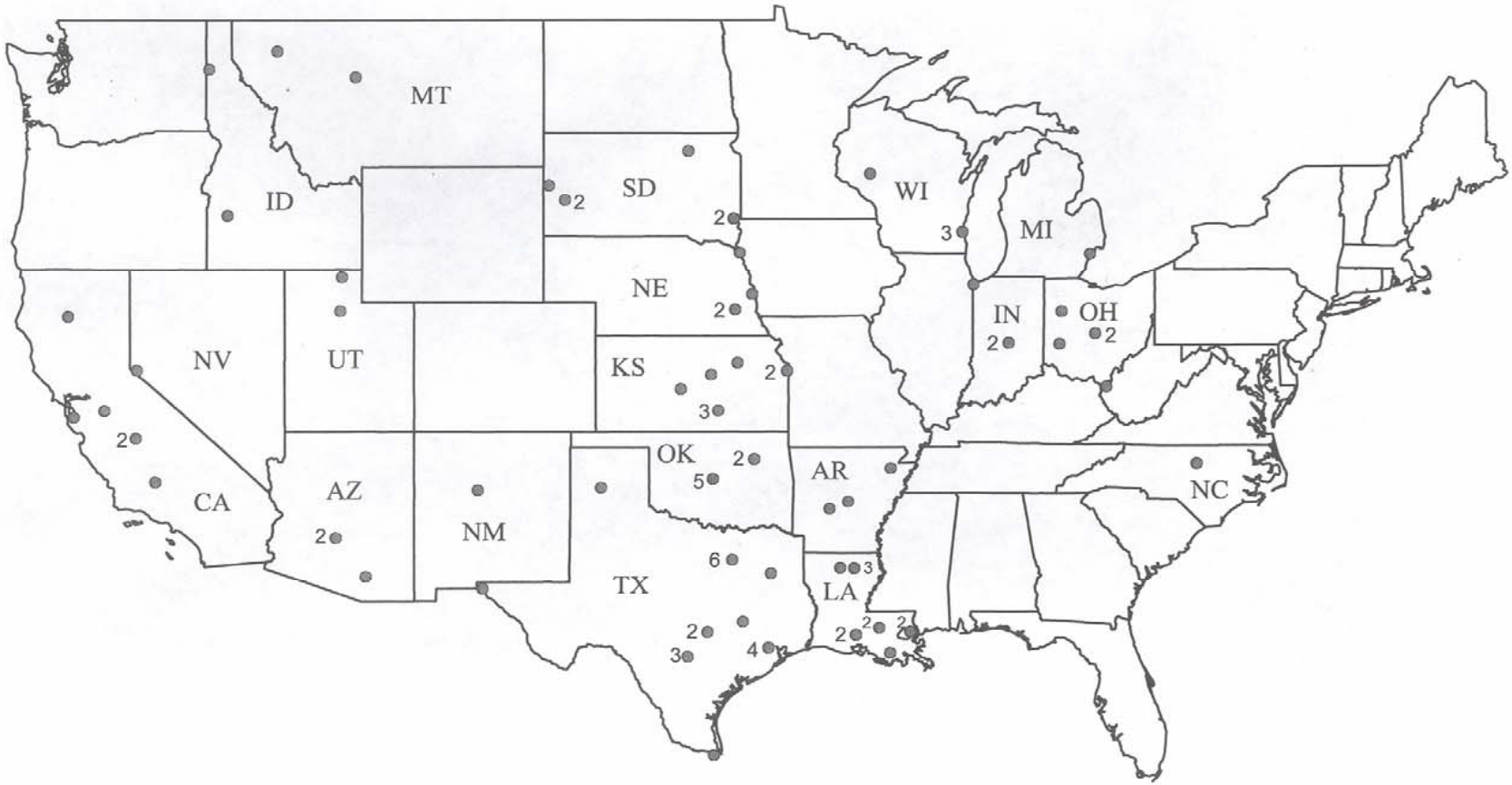
- Major heart surgery
- PTCA
- Other MDC 5

Major heart surgery includes valve, bypass, and other types of major surgery, distinct from angioplasties (PTCA).

MDC 8 (orthopedic and connective tissue disorders) is also divided into three subclasses:

- Major orthopedic surgery
- Minor orthopedic surgery
- Medical orthopedic

Exhibit 3-2
Physician-Owned Specialty Hospitals, 2004



Note: Each facility is indicated by a red circle. In areas where there are multiple facilities in close proximity, the number of facilities is indicated adjacent to the symbol.

Exhibit 3-3
Breakdown of MDC 5 for specialty hospital classification purposes

MDC 5 Subclass	DRGs
Major Heart	*Surgical:* 104 Cardiac Valve Procedures & Other Major Cardiothoracic Procedures with Cardiac Catheterization 105 Cardiac Valve Procedures & Other Major Cardiothoracic Procedures without Cardiac Catheterization 106 Coronary Bypass with PTCA 107 Coronary Bypass with Cardiac Catheterization 108 Other Cardiothoracic Procedures 109 Coronary Bypass without Cardiac Catheterization 110 Major Cardiac Procedures with Complications & Comorbidities 111 Major Cardiac Procedures without Complications & Comorbidities 113 Amputation for Circulatory System Disorders Except Upper Limb & Toe 515 Cardiac Defibrillator Implant without Cardiac Catheterization 525 Other Heart Assist System Implant 535 Cardiac Defibrillator Implant with Cardiac Catheterization with Acute Myocardial Infarction, Heart Failure, or Shock 536 Cardiac Defibrillator Implant with Cardiac Catheterization without Acute Myocardial Infarction, Heart Failure, or Shock
PTCA, etc.	*Surgical:* 115 Permanent Cardiac Pacemaker Implant with Acute Myocardial Infarction, Heart Failure, or Shock or AICD Lead or Generator Procedure 116 Other Cardiac Pacemaker Implantation 117 Cardiac Pacemaker Revision Except Device Replacement 118 Cardiac Pacemaker Device Replacement 516 Percutaneous Cardiovascular Procedures with Acute Myocardial Infarction 517 Percutaneous Cardiovascular Procedures without Acute Myocardial Infarction, with Coronary Artery Stent Implant 518 Percutaneous Cardiovascular Procedures without Acute Myocardial Infarction, without Coronary Artery Stent Implant 526 Percutaneous Cardiovascular Procedure with Drug-Eluting Stent with AMI 527 Percutaneous Cardiovascular Procedure with Drug-Eluting Stent without AMI
Other MDC 5	*Surgical:* 114 Upper Limb and Toe Amputation for Circulatory System Disorders 119 Vein Ligation and Stripping 120 Other Circulatory System O.R. Procedures 478 Other Vascular Procedures with Complications & Comorbidities 479 Other Vascular Procedures without Complications & Comorbidities *Medical:* All MDC 5 medical DRGs

These three orthopedic categories are based on whether the DRG is surgical or medical and, if surgical, whether the DRG weight is greater than or equal to 1.5 (i.e., "major").

Finally, all surgical DRGs are used to identify surgical specialty hospitals are separated into two subclasses:

- Major Surgery
- Minor Surgery

Major and minor surgery classes were based on whether the DRG weight is greater than or equal to 1.0.

We use the MDC and DRG subclasses to refine the definitions used by MedPAC. For example, MedPAC classified a hospital as cardiac if its MDC 5 share of Medicare discharges is greater than 45 percent (or if the sum of MDC 5 and MDC 8 discharges is greater than 66 percent of the total). However, it is possible that a hospital could be 45 percent MDC 5 without performing any open heart surgery, if it performs a number of PTCA and diagnostic cath procedures as well as seeing many medical heart cases. In fact, we found several general acute hospitals in the 2004 Medicare claims data that could be classified as a cardiac specialty hospital by this definition. We felt, however, that for a hospital to be classified as a cardiac specialty, it must be "full service" in the sense of providing the full range of cardiovascular procedures.[4] It is the siphoning off of major heart cases that appears to be the concern of nonprofit competitor facilities. Similarly, we felt that orthopedic specialty hospitals must perform a minimum number of Major Orthopedic Surgery procedures rather than a large number of just any of the MDC 8 (medical and surgical) cases.

Exhibit 3-4 summarizes the two RTI specialty hospital classification schemes as well as the MedPAC classification. In addition to the three specialty types, a fourth set of hospitals was determined to have too few (15 or less) Medicare discharges in the first half of 2004 to properly classify them into a specialty.

As shown in Exhibit 3-4, for a facility to be classified by RTI as a cardiac specialty hospital, not only did it have to have 45 percent (Variation 1) or more of its discharges in MDC 5, but it also had to have at least 5 Major Heart surgery discharges. A similar requirement was made for orthopedic specialty hospitals. (The 5 major cases requirement had almost no effect on final cardiac and orthopedic group sizes.) We originally identified a potential group that had less than 45 percent cardiac or orthopedics discharge shares but together had over two-thirds of their discharges in MDCs 5 and 8. However, only two or three qualified and were subsequently reclassified as cardiac, orthopedics, or surgical, depending upon their dominant MDC. Finally, if a potential specialty hospital did not qualify as either a cardiac or an orthopedic hospital, it usually still qualified as a surgical specialty hospital if it had at least 15 Medicare discharges in the first half of 2004.

Table 3-1 gives the breakdown of the 92 physician-owned specialty hospitals operational in 2004 categorized into the three specialty types (and a fourth set of low-volume hospitals). Of the 92 facilities, 17 had 15 or fewer Medicare discharges in the first half of 2004 and are deleted from all analyses. Relaxing the 45 percent threshold to 33 percent resulted in a reclassification of two surgical specialty hospitals to orthopedic and one to cardiac when comparing RTI Variation 1 and RTI Variation 2 (first two columns of Table 3-1).

[4] With the exception of heart transplants, but those procedures are not classified in MDC 5 anyway.

Exhibit 3-4
RTI and MedPAC specialty hospital classification schemes

Specialty type	RTI variation 1	RTI variation 2	MedPAC
Cardiac	• More than 15 total discharges; and • More than 5 Major Heart discharges; and • MDC 5 discharges comprise more than 45% of all discharges.	• More than 15 total discharges; and • More than 5 Major Heart discharges; and • MDC 5 discharges comprise more than 33% of all discharges.	• More than 15 total discharges; and • MDC 5 discharges comprise more than 45% of all discharges.
Orthopedic	• More than 15 total discharges; and • More than 5 Major Orthopedic Surgery discharges; and • Surgical MDC 8 discharges comprise more than 45% of all discharges.	• More than 15 total discharges; and • More than 5 Major Orthopedic Surgery discharges; and • Surgical MDC 8 discharges comprise more than 33% of all discharges.	• More than 15 total discharges; and • Surgical MDC 8 discharges comprise more than 45% of all discharges.
Cardiac & Orthopedic	Not Applicable	Not Applicable	• More than 15 total discharges; and • The sum of MDC 5 and surgical MDC 8 discharges comprise more than 66% of all discharges.
Surgical	• Not otherwise classified as Cardiac or Orthopedic; and • More than 15 total discharges; and • Surgical discharges comprise more than 45% of all discharges.	• Not otherwise classified as Cardiac or Orthopedic; and • More than 15 total discharges; and • Surgical discharges comprise more than 45% of all discharges.	• Not otherwise classified as Cardiac, Orthopedic, or Cardiac & Orthopedic; and • More than 15 total discharges; and • Surgical discharges comprise more than 45% of all discharges.
Other	• 15 or fewer total discharges. OR • More than 15 total discharges; and • Surgical discharges comprise less than 45% of total discharges.	• 15 or fewer total discharges. OR • More than 15 total discharges; and • Surgical discharges comprise less than 45% of total discharges.	• 15 or fewer total discharges. OR • More than 15 total discharges; and • Not otherwise classified as Cardiac, Orthopedic, Cardiac & Orthopedic, or Surgical.

Definitions:
Major heart: See Exhibit 3-3.
Major orthopedic: Surgery DRG weight > = 1.5.
Major surgery: DRG weight > = 1.0.

Table 3-1
Counts of specialty hospitals, by specialty type, using Two RTI classification schemes

Specialty type	RTI variation 1	RTI variation 2
Cardiac	20	21
Orthopedic	43	45
Surgical	12	9
Low volume	17	17
Total	92	92

NOTE: RTI Variation 1 uses a 45% case-mix threshold for classification, and RTI Variation 2 uses a 33% case-mix threshold.

SOURCE: RTI International analyses of Inpatient 100% SAF data for January through June 2004. Program WPAN WRUN14.

3.2.3 Identifying Competitor Hospitals

Section 507(c)(2) of the MMA requires that physician referral patterns, satisfaction and quality, and uncompensated care at specialty hospitals be compared to local full-service community hospitals. We identified local non-specialty, non-physician-owned competitor hospitals for each physician-owned specialty hospital using the following steps:

1. The ZIP code of all acute care hospitals in the country[5] was found in the POS File.
2. For all unique ZIP codes found in Step 1, the longitude and latitude of the centroid of each ZIP code was merged on from a ZIP code database acquired from the firm ZIPCodeDownload.com.
3. The distances between the centroids of all ZIP code pairs generated from Step 2 were computed, retaining ZIP code pairs where the centroid distance was 25 miles or less.
4. Using the ZIP code distances in Step 3, for each specialty hospital, all acute care hospitals within a 20 mile radius were identified.[6] The result is a list of *potential* competitors.
5. Each *potential* competitor first was classified as an *actual* heart or orthopedics competitor according to whether they met the 15 minimum Medicare claims criterion *and* had at least 15 Major Heart or 15 Major Orthopedic DRG discharges, respectively. Competitors for the "residual" set of surgical specialty hospitals included all acute general hospitals within a 20-mile radius of each facility.

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5 Identified by Medicare provider numbers between *xx*0001 and *xx*0899 inclusive (where *xx* denotes the two-digit Social Security Administration state code).

6 This distance was expanded to 25 miles for the two specialty hospitals located in micropolitan areas (10,000-50,000 residents), where the next nearest hospital was more than 20 miles away.

RTI's and MedPAC's classifications of competitors differ in that the Commission identified three competitor groups: (1) any local hospital; (2) a local or national peer hospital with a similar concentration of MDC 5 or 8 Medicare patients; and (3) any local hospital providing heart, orthopedics, or surgical care. Much of MedPAC's analyses used peer hospitals as the comparison group. RTI's comparison group, therefore, differs in requiring that the hospital be a *local competitor but not have to be nearly as focused on heart or orthopedics care*. We believe that because competitors are all general service providers, the "high share" rules for specialty hospitals should not apply to them. To be a heart or orthopedics competitor, however, the full-service hospital *must be performing at least a minimum amount (15 cases) of major surgery per year*. Note that a full-service hospital could be both a heart and an orthopedics competitor. Also, because all local hospitals do a range of surgery, in general, they all become competitors to the surgical specialty hospitals.

The Commission also relied upon the Dartmouth Atlas to limit the geographic market for all specialty hospitals. Their markets are independent of the number and geographic location of specialty hospitals within the area, while RTI's markets are "amoeba-like," based on 20-mile radii around each specialty hospital. In effect, each specialty hospital has its own set of service-specific competitors, e.g., heart hospitals within 20 miles. Pooling all competitors within a service category produces a "national" set of relevant competitors.

3.3 Hospital Market Case Studies

As a supplement to the secondary data analyses, and to help interpret the findings, RTI staff visited hospitals in six cities: Dayton OH, Fresno CA, Hot Springs AR, Oklahoma City OK, Rapid City SD, and Tucson AZ. These cities were selected based on the number and type of specialty hospitals in operation. (The initial list of specialty hospitals has been described above.) The Medicare POS File, AHA Guide Issues, and claims were used to describe each SPH and potential competitor hospitals within 20 miles radius of each SPH. Descriptors included: Medicare discharges by DRG, average length of stay, open heart and orthopedic services, number of beds, chain affiliation, and date opened. We also determined the area population and the number of specialty and competitor hospitals in each city. Cities were selected that displayed a range of specialty hospitals, both in terms of specialization and number. A city had to have at least one specialty hospital in operation for more than one year, thereby excluding several cities with very recent entrants (e.g., San Antonio, Lafayette, Los Angeles). We avoided Wichita, Sioux Falls, and Austin, which had already been visited by MedPAC staff. In consultation with CMS staff, we also strived for geographic representation. All specialty hospitals, to our knowledge, operate in non-Certificate of Need States, which is why they cluster in the mid- and southwest, as well as California. Finally, we selected cities based on a range of hospital competition from oligopoly to many providers. ***Table 3-2*** gives the six cities included in the case studies, providing the Census division, population in the metropolitan area, enrollment of Medicare beneficiaries in Medicare+Choice (now Medicare Advantage) plans in 2003, and the number of specialty hospitals.

Table 3-2
Site visit area characteristics

City	Census division	Area population	2003 Medicare+Choice plan enrollment	Number of specialty hospitals
Dayton, OH	East North Central	848,153	12.0%	1
Fresno, CA	Pacific	799,407	20.1	2
Hot Springs, AR	West South Central	88,068	0.1	1
Oklahoma City, OK	West South Central	1,095,421	7.8	6
Rapid City, SD	West North Central	112,818	0.1	2
Tucson, AZ	Mountain	843,746	33.0	1

SOURCE: RTI International analyses of the Medicare 2003 Annual County Enrollment File and the 2Q2004 Medicare Provider of Services File. CBSA definitions from the Census Bureau.

3.3.1 Description of Study Market Areas

A brief description of the hospital market in the six cities that we visited is provided below.

Dayton, Ohio

The Dayton area has a single physician-owned specialty hospital, a 47-bed heart hospital affiliated with MedCath. This hospital started as a joint venture between MedCath, a large general hospital affiliated with a religious order, and the largest cardiology group in the city. However, the co-owning general hospital closed shortly after it transferred its cardiac services to the newly opened heart hospital. At the time of the site visit, four general hospitals (all not-for-profit and members of one of the two hospital networks in the area) performed open heart surgeries, only one of which performed more than 300 in 2003. The closest general hospital is also the largest in the city, with the busiest emergency department and the only Level I trauma center in the city (its sister hospital has a Level II trauma center). The cardiology group that co-founded the heart hospital provided a majority of cardiology services in this hospital, and so it has experienced the largest impact on heart surgery volumes. The relationship between this hospital (and its sister hospital) and this cardiology group has become quite strained, and a small number of the cardiology group's physicians have lost their privileges at the major hospital (though they were not practicing much there prior to losing privileges). Also, a number of major health plans in the area have been reluctant to contract with the heart hospital.

Fresno, California

The Fresno market has two proprietary physician-owned hospitals. One is a heart hospital jointly owned by the local community hospital, which opened in November 2003. The other is a smaller, 20-bed surgical hospital specializing in elective orthopedic surgery that first opened in 1984. It is essentially 100 percent physician-owned, either individually or by physician practices. The heart hospital has two primary full-service nonprofit competitors, including its joint partner that decided not to relocate all of its major heart surgery to the specialty heart hospital. The

surgical specialty hospital competes with these two facilities as well as with another smaller community hospital and a large Kaiser HMO hospital. Kaiser contracts with the faith-based general acute hospital for its major heart surgery (it recently opened its own heart center) and with the surgical specialty hospital for "spillover" general surgery. The large community hospital serves the downtown area and its large Medicaid and uninsured population. It is also the primary trauma center in the city. At least 15 ASCs heighten competition—especially for the surgical specialty facility. High population growth mitigates (in a minor way) the volume effects of vigorous hospital competition. The population also has a high prevalence of pulmonary, heart, diabetes, and other illnesses associated with a semi-rural population.

Hot Springs, Arkansas

The Hot Springs market has one proprietary surgical specialty hospital that is 100 percent physician-owned with a focus on artificial joint replacements. Two other full-service hospitals are major competitors at 8 to10 times the inpatient size of the specialty facility. The city has a growing resort population with elderly retirement centers and was recently designated an MSA. The faith-based general acute hospital, one mile from the specialty hospital, dominates care in the city and enjoys an exclusive Blue Cross contract covering 70 percent of the private business in the city. Medicare patients comprise over 70 percent of hospital inpatients in the city, however. Five of seven orthopedic surgeons have invested in the specialty hospital but retain admitting privileges in the two general acute facilities. Relationships between the physician owners, the two competitor hospitals, and their physician groups were reportedly strained—particularly over taking call in the competitor hospital ERs and staff recruitment. Any Willing Provider legislation is hotly contested in the state and is currently under appeal. If it were approved, it would open up the exclusive Blue Cross and other managed care contracts to the specialty hospital.

Oklahoma City, Oklahoma

The Oklahoma City market, at the time of the site selection, had six physician-owned specialty hospitals (not counting two women's hospitals). One is a large heart hospital[7] with joint ownership between physicians and another local community hospital. The other five specialty hospitals are orthopedic providers of varying types and several all almost entirely physician-owned. The 80-bed heart hospital has 4 to 5 major local acute general hospital competitors (depending on how its joint ownership arrangement with one of these competitors is defined). The orthopedic hospitals are 20 beds or less and compete with all the major acute hospitals as well as 16 Ambulatory Surgical Centers in the city. A couple of orthopedic specialty hospitals are joint ventures with community hospitals while others are spin-offs from other specialty hospitals. Managed care has been on the decline, and the OU Medical Center (now managed by HCA) has a large indigent care contract with the state; consequently, most uninsured are treated in that facility. The city is geographically dispersed and all facilities draw from the underserved surrounding areas—especially the heart hospital.

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[7] Not included in MedPAC's list because it has been in operation less than 2 years.

Rapid City, South Dakota

In Rapid City, there is a single not-for-profit acute care hospital, providing a range of services, including trauma and other tertiary care; two physician-owned specialty hospitals; and an Indian Health Service hospital (the next-nearest hospitals are over 50 miles away). One of the specialty hospitals was started by the dominant neurosurgery group in the area with a six-bed inpatient unit and an ASC. Originally, surgeons of many different specialties invested in and operated in this hospital, ranging from pediatric dentistry to gynecological, hand, and back surgeries. It has since expanded its bed complement to 24 and has mostly concentrated in orthopedics and neurosurgery. The other physician-owned specialty hospital, a surgical hospital, began as an ASC (without any inpatient services) that was a joint venture between the not-for-profit acute hospital and a group of physicians. After the opening of the other physician-owned specialty hospital, this second facility opened a six-bed inpatient unit. A variety of surgeries of different specialties are performed here, and the large majority of surgeries do not result in overnight stays. Most of the physician-owners of both specialty hospitals continue to practice in the general hospital, with the exception of the founder of the larger specialty hospital. Managed care has a negligible small presence; Medicare and Blue Cross are the major insurers. The area is largely rural, and all hospitals in this market regularly draw patients from more than a hundred miles away.

Tucson, Arizona

The Tucson market has one proprietary heart hospital with physician ownership, Tucson Heart Hospital, a MedCath facility. At the time of our visit, three other local hospitals (one proprietary) were performing open heart surgery (valves and heart bypasses) and three other facilities had closed their open heart services in the last few years. Two of the closed facilities actually did so in return for a percentage ownership share in the new Tucson Heart Hospital. University Hospital treats a large percentage of the city's Medicaid and uninsured and is the only major trauma center. The city is geographically dispersed and this has some influence on patient flows as well as on the different hospitals that cardiologists referred to. Several major managed care plans have exclusive contracts with certain facilities for patient care that further restricts physician referrals to the heart or competing hospitals. Global per diems are popular among the plans that limit the profitability of private heart patients. The city has a rapidly growing, highly seasonal population that results in under- and over-bedding and staffing challenges. Hospital Emergency Room diversion is a contentious problem throughout the city. Heart care is dominated by two large, highly competitive cardiovascular groups with admitting privileges in two or more hospitals.

3.3.2 Site Visit Procedures

RTI staff worked with the CMS Project Officer and representatives of the specialty hospital associations, the AHA, and the Federation of American Hospitals in contacting and gaining participation of the specialty and competitor hospitals. All specialty hospitals were visited in five of the six cities. In Oklahoma City, four of six specialty hospitals were visited, resulting in a total of 11 specialty hospital case studies. In addition, interviews were conducted in 11 competing hospitals in the same cities. They were selected either on whether they were

performing open heart surgery or whether they were the major acute general facilities in the market.

Two- to four-person teams visited hospitals in each city for 2-3 days. The team spent full days in each of the four specialty cardiac hospitals and half days or longer in each of the other seven specialty hospitals. Two to four hours were spent by the team in each competitor hospital. The focus of the site visits was clearly on the specialty rather than competitor hospitals. This was because the purpose of the site visits was largely to gather contextual and explanatory information that would help us interpret the empirical analyses of the specialty hospitals. *We wanted to focus our limited resources on understanding how and why specialty hospitals in these markets operate.*

Informal discussion guides were used in interviews with key specialty hospital personnel: CEOs, CFOs, Medical Directors, V.P.s of Clinical Services, physician non-owners, Directors of Nursing, the Emergency Department, Discharge Planning, Quality Assurance, and Catheter Lab, as well as ICU and floor nursing staff. Group meetings with physicians who founded each specialty hospital were also held. Competitor hospital interviews were restricted to a smaller set of interviews: CEOs, CFOs, Medical Directors, and key physicians. These discussions were more focused on competition with the specialty hospitals, how community hospitals have responded, and perceptions regarding quality and access issues engendered by the establishment of local specialty hospitals.

Discussion protocols can be found in ***Appendix 3.*** Notes from all site visits were used to provide context for the empirical results presented in subsequent sections of this report.

Critical financial data was also collected from the specialty hospitals (described next).

3.4 Specialty Hospital Financial and Physician Ownership

Financial information was collected from each of the 11 specialty hospitals in the case studies. Data included ownership shares by physicians, other hospitals, private management firms such as MedCath, and private individuals. Ownership shares of each physician were reported along with their UPIN and Social Security numbers used to link ownership to Medicare claims. Ownership shares were reported at initiation and for the most current period.

Payer information included counts of discharges, inpatient days, and outpatient and emergency visits stratified by Medicare, Medicaid, private insurance, self-pay, and other. Uncompensated care, reported as costs or charges, was reported either as bad debt or charity care.

Taxable income base amounts in the last three fiscal years were collected along with income, sales, real estate, personal property, and any other taxes. Appendix 3 presents the forms used to report financial data.

To supplement the financial information, specialty hospitals were also asked to provide copies of any prospectuses supporting initial public offerings of stock, blank copies of their ownership agreement with physicians, and any market value assessments of the LLC made in the last two years.

3.5 Medicare IPPS Claims

The *base* analytic file contained 2003 Medicare *inpatient* PPS claims from physician-owned specialty hospitals and general hospitals within 20 miles of each specialty hospital. For the beneficiaries with a specialty or competitor hospital discharge in a given year, the file contains all their inpatient post-discharge acute readmissions from hospitals more or less than 20 miles from the hospital.

As of the date of this report, base analytic files and PAC files were created for 1998 through 2003. All analysis to date has been conducted on calendar year 2003 acute hospital inpatient claims alone. The 2003 file has slightly over 2 million claims from approximately 540 hospitals. The 2003 file has 84 SPHs, eight fewer than the 92 listed in Table 3-1. These eight SPHs (two cardiac, three orthopedic, and three low-volume) opened during December 2003 and early 2004, thus accounting for their absence in the 2003 claims.

In addition to claims from the SPHs, claims for the 2003 inpatient PPS file were initially drawn for potential competitor hospitals within 25 miles of the SPHs for the SPH-determination process described in Section 3.2. And, as will be discussed in the section on physician referral patterns, the number of claims used for specific comparisons of SPHs (e.g., cardiac) to their competitors was a small subset of the original 2 million claims.

3.6 Other Analytic Variables

The primary sources of variables merged onto analytical claims files are as follows:

- Denominator file
- DRG weight file
- APR-DRG grouper
- UPIN Registry (HCFA physician specialty codes were obtained from here)
- Specially constructed hospital-level indicator variables

Market areas are identified using Census Bureau Statistical Area (CBSA) codes and names that OMB created during 2003 to replace the familiar MSAs. One hospital-level indicator identifies whether it is a physician-owned specialty or competitor hospital.

Using discharge diagnostic and procedure information, each specialty hospital was assigned to one of three specialty (service) categories: cardiac, orthopedic, or surgical. (See Section 3.2 on how hospitals were identified.) Next, each general hospital that competes with the specialty hospital was categorized using three separate indicator variables, depending on whether they qualified as a cardiac, orthopedic, and/or surgical competitor. For example, in Oklahoma City, Integris Baptist Hospital was assigned to the cardiac and orthopedic service categories because it competes, respectively, with the Oklahoma Heart Hospital as well as with the orthopedic specialty hospitals.

The APR-DRG classification was used primary to stratify comparisons between specialty and acute general competitors. Particularly important are the 4-level severity groups used in this system: minor, moderate, major, and extreme. These have been developed by 3M Corporation to indicate how complex the treatment is for a given patient. In most analyses of referral patterns, transfers, and outcomes, a two-part severity indicator was used that combined major/extreme into a single "high severity" class. See Section 4.2 for details on the 3M severity classifications.

3.7 Medicare Cost Report S-10 Uncompensated Care Information

Worksheet S-10 of the Medicare Cost Reports (MCRs) is a new worksheet (required for MCR submissions for cost reporting periods ending on or after April 30, 2003) requesting various information on uncompensated care provision. Although this information is potentially an important source of information on uncompensated care, data limitations prevents us from using this source. Section 7 of this report describes these limitations in greater detail.

3.8 IRS 990 Financial Statements on Nonprofit AGH Competitors

Another important source of data used in this study is the Internal Revenue Service (IRS) Form 990 data submission (see Appendix 3). All not-for-profit organizations are required to submit this form annually to the IRS. In this form, organizations must include financial statements (statements of revenues and expenses, change in net assets, and balance sheet). A reconciliation between its audited financial statements and information provided on the return must be included. Organizations must also describe their functional mission, including a statement of functional income and expenses, as well as a description of their mission. Many not-for-profits include a summary of their community benefits report, which is an additional source of information on bad debt and charity care provided. The Form 990 also includes other information, such as the names and salaries of officers and highly-paid employees, as well as the identities of related organizations (both for- and not-for-profit).

SECTION 4
SPECIALTY HOSPITAL REFERRAL PATTERNS

4.1 Overview

4.1.1 Policy Concerns

A policy concern frequently raised regarding specialty hospitals is that physician owners refer more profitable patients with fewer complications and lower medical acuity to their own specialty hospital. For Medicare patients, specifically, they would have a financial incentive to selectively admit less ill patients to their own hospital because the program pays the hospital a fixed payment per discharge within a diagnostic (DRG) category and these patients should cost less to treat. This behavior, if true, may provide an unfair financial advantage for physician-owned specialty hospitals in local hospital markets.

Referral decisions, it must be said, are also influenced by factors unrelated to personal financial incentives (discussed below). Unfortunately, we cannot directly observe referrals by physician owners made solely for financial reasons. However, we can observe the net effects of all factors on their referral decisions and examine patterns of discharges and transfers that would be consistent with referral decisions based largely on financial incentives. For example, if physician owners made referrals based primarily for financial gain, they should refer lower acuity patients to their own hospital within selected DRGs. They should also transfer complex patients to local community hospitals while accepting many fewer, if any, complex transfers from these same hospitals. An examination of their admission patterns through the emergency department should also shed light on any systematic triaging of patients by severity and expected profitability.

4.1.2 Policy Questions

Using a combination of Medicare claims, physician ownership information, and on-site interviews gathered from 11 specialty hospitals in six cities, we address the following policy questions:

- Do specialty hospital physician owners refer patients primarily to their own facilities, and how does their behavior differ, if at all, from non-owners who also admit to the specialty hospital?

- Do specialty hospitals in general, and physician owners in particular, systematically treat Medicare patients with a lower acuity than patients in peer community hospitals with the same condition?

- Do specialty hospitals transfer patients with higher acuity to peer community hospitals more often than do other peer hospitals and do they receive fewer high acuity patients in return?

- Do specialty hospitals admit fewer, less acutely ill, patients through their emergency rooms than do peer community hospitals?

4.1.3 Impact of Other Factors on Referrals

Before presenting our findings on physician referrals, we first describe in more detail three factors mentioned in our case study interviews that affect referrals. An appreciation of these factors will help interpret the quantitative findings.

Limited emergency room capabilities. Most states require an acute hospital to have an emergency room (ER) for licensure--California appears to be an exception. ER regulations allow considerable latitude, however, in the size and capabilities of the ER. Except for the heart hospital in California we visited, cardiac specialty hospitals operated 8-10-bed emergency rooms with a full time emergency care physician and staff. Orthopedic and surgery hospitals, with one or two exceptions, operated what could be considered "token" emergency rooms with only a single bed and on-call physician staffing. Emergency rooms embody conflicting incentives for hospitals. On the one hand, they are an important source of inpatient and outpatient referrals. On the other hand, ERs attract a generally higher acuity patient when admitted. Cardiac specialty hospitals we visited used their emergency rooms as an important source of referrals and exceeded state licensure requirements. Orthopedic and surgical specialty hospitals concentrate on elective surgery with very few emergency cases, although exceptions exist.[8]

Advantageous location: Specialty hospitals we visited tended to locate in wealthier parts of the city with limited access by poorer, uninsured, patients. This, in turn, affects referral patterns to the degree poorer patients have more unmet health needs at time of hospitalization. Locational advantages are further enhanced in cities are served by "safety net" hospitals responsible for the care of uninsured patients. But since we observed both specialty and community hospitals locating in "advantageous" areas, it is not likely that this factor is a major, consistent contributor to observed differences in patient severity and complexity between specialty and competitor hospitals—with the possible exception of "downtown" safety net hospitals.

Service and ownership arrangements with local hospitals: Joint ownership of the specialty hospital by a local community hospital was found in 5 of 11 specialty hospitals we visited. Under joint ownership arrangements, the most complex patients are referred immediately, or soon after surgery, to the community hospital partner. Partnership with a community hospital had definite other advantages as well, including greater negotiating power with insurers and in securing private managed care contracts. In some cases, joint ownership and arms length service agreements appeared harmonious, and one or two hospitals were even physically linked in close proximity. At the other extreme, a community hospital with a large investment in it sister specialty hospital continued to operate a competing cardiac service in its own facility a few miles away.

Each of these three factors shape the observed referral patterns of physician owners and non-owners alike. We also note that some community hospitals had limited emergency rooms, or had relocated to wealthier sections of the city, or had merged with other hospitals and divided up

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8 One orthopedic specialty hospital we visited operated a large, nearly full-service, ER and was losing money every year. Unlike other such facilities, it had a much broader range of specialties among its physician owners and the hospital served as an alternative practice venue as much as a profit center.

services to achieve efficiencies and serve the public better. Besides these facility-based factors, individual physicians face constraints in making referrals on daily basis.

Patient preference for a particular hospital: Patients may prefer a specialty over a general hospital because of its single rooms and hotel-like amenities or, conversely, may prefer to return to a local hospital where they had been treated in the past. The reader is referred to Section 6 on Patient Satisfaction for more details.

Perceived care needs of patient by referring physician: Referring physicians must consider the service needs for a particular patient and where he/she will receive the highest quality of care. Physician owners and non-owners using the specialty hospital felt that the overall quality of the care was better because of higher procedure volumes, lower patient-to-nurse ratios, and more patient amenities (like private rooms). In sharp contrast, physicians in community hospitals were concerned that patients in specialty hospitals lacked the necessary intensive medical care backup on site that was available in their facilities.

Physician preference based on proximity and hospital work environment: physicians working in specialty hospitals may find it more convenient, on occasion, to admit a patient to a general hospital nearer their office or that offers other conveniences. Physician and non-physician owners in all sites we visited argued that specialty hospitals are better able to schedule patients convenient to the physician and to complete procedures/operations on time. All other things being equal – if patients' insurance was accepted and patients were agreeable – better access increased surgeons' likelihood of referring to the specialty hospital. Physician owners and non-owners also emphasized the specialty focus of the clinical and technical support staff as important reasons why they refer to specialty hospitals. The reader is referred to Section 5 on Quality of Care for more details.

Emergency room "call" by physician owners in community hospitals: Many physician owners we interviewed took emergency room call in local general hospitals, which is the antithesis of "economic credentialing." ER "call" occurs for a number of reasons. Physician owners said they needed to see patients in the larger emergency departments of community hospitals in order to serve the community and to make a living. Community hospitals also needed their specialized expertise to properly care for emergency patients entering their doors.[9] Thus, it should not be surprising when we show physician owners treating significant numbers of patients at local competitor hospitals—especially sicker patients coming in through the emergency room.

Insurance Coverage & Networks: In our site visits, we found that insurance was a significant determinant in physician referral decisions. In several markets, community hospitals had entered into aggressive exclusive contracts with major insurers. One community hospital allegedly negotiated with managed care organizations under the condition that the heart hospital not be included in their local insurance network. Another heart specialty hospital, along with its community hospital partner, lost a lucrative, exclusive Kaiser heart surgery contract to a nearby general hospital. In still another market, the dominant general hospital enjoyed a long-term,

9 While "call" arrangements worked reasonably well in some markets, in others there was tension between specialty hospital physicians and general hospital managers over compensation and hours.

exclusive BC/BS contract for 70 percent of the private market business. We found no evidence of specialty hospitals holding exclusive insurance contracts that would draw significant business away from the community hospitals. In fact, a few specialty hospitals were lobbying for "any willing provider" legislation in their state in order to be able to refer insured patients to their facility.

When interpreting the findings from the quantitative analyses presented in this chapter, it is important to keep all of these factors in mind. We now turn to the methods and quantitative analyses of referrals.

4.2 Methods & Study Limitations

In studying physician referrals, we drew upon four sources of information (see Section 3 for more details):

- Medicare claims for the universe of specialty hospitals with calendar year 2003 data
- Ownership shares reported for all physician owners in the 11 case study specialty hospitals
- Extensive interviews with physician owners, non-owners, and managers in specialty hospitals in 6 markets (Tucson, Hot Springs, Fresno, Dayton, Rapid City, and Oklahoma City)
- Interviews with physicians and hospital managers in at least two peer competitor hospitals in each case study market (except Rapid City that has only one community hospital).

We were able to link Medicare claims to physician owners who had billed the program in 2003. This allowed us to compare referral patterns of owners with non-owners, but only for six cities. We also took advantage of our much larger set of specialty hospitals to analyze referral patterns at the facility level.

4.2.1 3M Severity Level

To measure patient severity, we used the classification system developed by 3M as part of their APR-DRG grouping of patients (Averill, 1995). The goal was to create a far more refined measure of patient severity than existed in the initial DRG system by better differentiating the "severity" of certain complications and how they might interact to greatly increase a patient's overall severity level. While there is a general correspondence between the CC/non-CC pairs in DRGs and the four severity levels used in APR-DRGs,[10] 3M's refined classification emphasizes interactive secondary complications much more.

[10] Most non-CC secondary diagnoses in the DRG system fall into the lowest, minor, APR-DRG severity level. An example of a non-CC diagnosis in the DRG system that is considered an extreme, level 4, complication in the APR-DRG system is salmonella meningitis (Averill, 1995, p. 4).

3M clinical panels developed two alternative sub-classification groupings to reflect patient severity along two dimensions. Their severity of illness classification, the one used in our study, is designed to capture the extent of physiologic decompensation or organ system loss of function.[11] Each patient is first classified in an APR-DRG according to their principal diagnosis or procedure (e.g., cardiac valve procedure with catheterization; angina). All secondary diagnoses are then assigned by clinicians to one of four groups: minor, moderate, major, extreme. For example, the severity level for respiratory diagnoses progresses from bronchitis (minor), to asthma with status asthmaticus (moderate), to viral pneumonia (major), and finally to respiratory failure (extreme). Next, the algorithm adjusts upwards the base classification of secondary diagnoses for more "severe" APR-DRGs (e.g., bypass) and computes the base severity level as the maximum level of any secondary diagnosis. Finally, it reserves the major and extreme severity classes to patients with multiple major or extreme co-morbid diagnoses. Requiring multiple serious complications to be classified in the major/extreme categories avoids classifying all patients in a "serious" APR-DRG (e.g., bypass, hip fracture) at the top levels. The reader is referred to Averill (1995) for more details on the steps involved in classifying patients by severity of illness.

4.2.2 Limitations

Our analyses of referrals have a number of limitations that should be recognized.

- First, based on available resources and time to conduct this study, we were only able to visit and gather information on physician owners in 11 specialty hospitals in six cities.[12] While we believe the patterns we observe give a reasonable picture of a range of specialty hospital types in different markets, our findings may not be representative of all specialty hospitals. Our results also suggest that market structure and local competition have a great deal to do with referral patterns and ownership effects, which is why we show many results at the market level.

- Second, even though we have ownership shares for 375 physicians in 11 specialty hospitals, we were limited in our ability to statistically test for ownership effects on referral patterns due to small sample sizes—especially after stratifying by type of specialty hospital.

- Third, all of our quantitative analyses of referrals are limited to Medicare claims. Patient referrals based on other payers cannot be considered here because no comprehensive all-payer database exists.

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11 Risk of mortality, the other dimension, captures differential risks of dying. Because so few specialty hospital patients die during their inpatient admission—especially in specialty orthopedic and surgical hospitals, we believe that 3M's severity of illness classification is better suited to measure severity differences in referral patterns. 3M also has developed relative cost weights for all the APR-DRGs and their 4 severity levels. We investigated their use but found that they "overstate" the severity of patients who are undergoing expensive, but not necessarily "risky" or "severe" procedures (e.g., PTCA).

12 These 11 specialty hospitals represent 10 of the 92 physician-owned specialty hospitals we identified as operational in the first half of 2004.

- Fourth, it was clear from our case study interviews that not all peer hospitals are equal competitors. In fact, in five of the 11 specialty hospitals we visited, "competitor" community hospitals actually owned part of the specialty hospital. This can have a significant effect on referral patterns. Where it does in the six study sites we note it, but we do not have the ownership information for specialty hospitals in other markets.

4.3 The Extent of Physician Ownership

Before addressing the relationship between physician ownership and referral patterns, we first provide a summary of the varying ownership stakes of physicians in the 11 specialty hospitals that we visited. Nearly 60 percent of the 373 active billing physicians with ownership in a specialty hospital owned less than one percent of the hospital (***Table 4-1***) while only 11.5 percent had five percent or more. Individual ownership stakes in cardiac specialty hospitals were small, with few above two percent. If financial incentives from ownership are a factor in referral decisions, we should observe higher referral rates among physician owners with larger shares in their facilities. Mitigating this relationship to some extent is the fact that all owners, regardless of their share, stand to gain something by admitting patients to their specialty hospital *so long as these patients are profitable*.[13]

4.4 Referral Patterns Differences between Physician Owners and Non-Owners: Medicare Discharges

Do physician owners of specialty hospitals refer patients primarily to their owned facilities given their financial incentives to do so? Furthermore, if the financial incentives of ownership affect referral decisions, we should observe a higher percentage of referrals for physician owners to their own specialty hospitals relative to physician non-owners.

To examine these questions, physicians, first, were categorized as non-owners or owners based on information provided by specialty hospitals. Non-owners in a market without any Medicare discharges from a specialty hospital in 2003 were dropped from the analysis under the assumption that they did not have admitting privileges at the specialty hospital. Comparisons were then made of referral patterns between physician owners and non-owners with at least one admission to a specialty hospital.

[13] Besides factors of convenience and efficiency that would also encourage specialty admissions, owners would have an incentive to admit patients of somewhat higher acuity in order to spread the high fixed costs over more patients, i.e., so long as patient marginal costs are covered.

Table 4-1
Distribution of active physician ownership shares in 11 specialty hospitals, 2004

			Heart Hospitals			Orthopedic Hospitals			Surgical Hospitals			All Spec Hospitals	
			Count	Pctg	Cumulative Pctg	Count	Pctg	Cumulative Pctg	Count	Pctg	Cumulative Pctg	Count	Pctg
0	Up to	0.5%[1]	62	41.9%	41.9%	81	43.5%	43.5%	1	2.6%	2.6%	144	38.6%
0.5%	Up to	1.0%	44	29.7	71.6	26	14.0	57.5	9	23.1	25.6	79	21.2
1.0%	Up to	1.5%	17	11.5	83.1	14	7.5	65.1	0	0.0	25.6	31	8.3
1.5%	Up to	2.0%	5	3.4	86.5	8	4.3	69.4	5	12.8	38.5	18	4.8
2.0%	Up to	2.5%	8	5.4	91.9	14	7.5	76.9	2	5.1	43.6	24	6.4
2.5%	Up to	3.0%	11	7.4	99.3	3	1.6	78.5	2	5.1	48.7	16	4.3
3.0%	Up to	3.5%	0	0.0	99.3	5	2.7	81.2	2	5.1	53.8	7	1.9
3.5%	Up to	4.0%	0	0.0	99.3	0	0.0	81.2	2	5.1	59.0	2	0.5
4.0%	Up to	4.5%	0	0.0	99.3	5	2.7	83.9	0	0.0	59.0	5	1.3
4.5%	Up to	5.0%	0	0.0	99.3	0	0.0	83.9	4	10.3	69.2	4	1.1
5.0%	Up to	6.0%	0	0.0	99.3	16	8.6	92.5	3	7.7	76.9	19	5.1
6.0%	Up to	7.0%	0	0.0	99.3	1	0.5	93.0	3	7.7	84.6	4	1.1
7.0%	Up to	8.0%	0	0.0	99.3	9	4.8	97.8	0	0.0	84.6	9	2.4
8.0%	Up to	9.0%	0	0.0	99.3	2	1.1	98.9	4	10.3	94.9	6	1.6
9.0%	Up to	10.0%	1	0.7	100.0	0	0.0	98.9	0	0.0	94.9	1	0.3
10.0%	Up to	15.0%	0	0.0	100.0	1	0.5	99.5	2	5.1	100.0	3	0.8
15.0%	And above		0	0.0	100.0	1	0.5	100.0	0	0.0	100.0	1	0.3
	Totals		148	100.0%		186	100.0%		39	100.0%		373	100.0%

NOTE: Physician owners limited to those actively billing Medicare.
[1]Share not including top %.

SOURCE: Primary data provided in 11 specialty hospitals in 6 cities, 2004.

4.4.1 Cardiac Hospitals

Table 4-2 shows Medicare cardiac discharges for cardiac specialty and competitor hospitals by physician ownership status. Results are presented separately for three markets for which we had sufficient volumes: Dayton, Oklahoma City and Tucson.[14] Figures show the number and distribution of discharges by owners versus non-owners to the specialty hospital versus other local peer group competitors.

Table 4-2
Cardiac discharges by hospital and ownership status of referring physician

	Number of Discharges		Percentages	
Hospital where patient treated	Non-owners with privileges	Owners	Non-owners with privileges	Owners
Dayton Heart Hospital	456	1,344	31%	65%***
Competitors	998	738	69	35
Total discharges	1,454	2,082	100	100
Oklahoma Heart Hospital	643	2,895	76	75
Competitors	200	988	24	25
Total discharges	843	3,883	100	100
Tucson Heart Hospital	621	965	33	53***
Competitors	1,267	867	67	47
Total discharges	1,888	1,832	100	100

NOTE: ***Statistically significant at 1% level.

SOURCE: 2003 Medicare IPPS claims.

Physician owners in Dayton and Tucson referred significantly higher percentages of their patients to their own specialty hospital than did non-owners. No such difference was found for the Oklahoma Heart Hospital (OHH), which was also unusual in its concentration of referrals for both owners and non-owners (roughly 3-in-4 cases). OHH's surprisingly high referral rate from non-owners may be explained by the fact that the hospital's not-for-profit hospital partner, Mercy Hospital, is connected by a tunnel. It is likely that physicians on Mercy's staff are routinely referring cardiac patients next door for surgery. Thus, it seems reasonable to conclude that cardiac specialty owners generally do refer to their own facility more often (i.e., 50 to 100 percent more likely than non-owners who do use the facility). This conclusion, however, is quite sensitive to any partnership arrangement.

[14] The Fresno Heart Hospital (FHH) was open for only the last three months of 2003. Although it would have been possible to use only the claims from the last quarter of 2003, physician referral patterns during start-up period might not have been representative of referral patterns once FHH became established in the community. Consequently, FHH and its competitors were not included in Table 4-2.

4.4.2 Orthopedic Hospitals

Physician referrals in the three markets with orthopedic specialty hospitals show a quite different concentration than in cardiac hospitals (***Table 4-3***).

Table 4-3
Orthopedic discharges by hospital and ownership status of referring physician

	Number of Discharges		Percentages	
Hospital where patient treated	Non-owners with privileges	Owners	Non-owners with privileges	Owners
Fresno Surgery Center	84	199	21%	24%
Competitors	310	624	79	76
Total discharges	394	823	100	100
Oklahoma City Specialty Hospitals (5)[1]	289	269	39	46**
Competitors	449	313	61	54
Total discharges	738	582	100	100
Black Hills Surgery Center	8	378	35	41
Competitors	15	535	65	59
Total discharges	23	913	100	100

NOTE: [1]Figures for the five Oklahoma City orthopedic specialty hospitals are combined.

**Statistically significant at 5% level.

SOURCE: 2003 Medicare IPPS claims.

"Self-referral" rates for physician owners were considerably lower than for cardiac owners and generally indistinguishable from rates for non-owners. Indeed, orthopedic physician owners are more likely to see patients in competitor hospitals than their own. A less concentrated pattern of self-referrals seems inconsistent with the higher average ownership percentages shown in Table 4-1. One possible explanation, explored more below, is that orthopedic surgeons investing in their own hospital reserve it more for elective cases and take call in competitors' emergency rooms to round out their caseloads. Cardiac specialty hospitals may offer a broader array of heart services and therefore are able to concentrate their cases more in their own, larger, facilities.

4.4.3 Surgical Hospitals

Finally, we looked at Medicare discharges from surgery specialty and community hospitals by physician ownership categories. ***Table 4-4*** shows Medicare surgery discharges for surgery specialty and competitor hospitals by physician ownership status. Results are presented separately for each of the markets we visited with surgery specialty hospitals (Hot Springs and Rapid City). The same definitions of physician ownership were used as in Table 4-2.

Table 4-4
Surgery discharges by hospital and ownership status of referring physician

Hospital where patient treated	Number of Discharges		Percentages	
	Non-owners with privileges	Owners	Non-owners with privileges	Owners
Healthpark Hospital	24	218	12%	68%***
Competitors	170	103	88	32
Total discharges	194	321	100	100
Same Day Surgery Center	14	0	39	0***
Competitors	22	394	61	100
Total discharges	36	394	100	100

***Statistically significant at 1% level.

SOURCE: 2003 Medicare IPPS claims.

For surgery hospitals, we see some of the same patterns observed for cardiac and orthopedic Medicare discharges. In Hot Springs, as in many of the other sites, physician non-owners who discharge at least some patients from specialty hospitals show a preference for community hospitals. Physicians owners of HealthPark Hospitals, on the other hand, discharge most of their Medicare surgery patients from their specialty hospital. In Rapid City, however, physician non-owners who discharge at least some Medicare patients from the general surgery center show a very small preference for the community hospital (which has a significant ownership stake in Same Day Surgery Center). Among physician owners, all of the Medicare discharges among the top eight general surgery DRGs were discharged from the community hospital. This result should be interpreted with caution, however; we believe that physician owners at the Same Day Surgery Center likely have Medicare discharges from this specialty hospital in other DRGs.

In summary, this basic analysis of Medicare discharge patterns presents a rather complicated picture of physician referral patterns. While we do observe a general preference for community hospitals among many non-owners who discharge at least some Medicare patients from specialty hospitals, there is an exception (Oklahoma cardiac). Also, in some markets, the difference in physician non-owner discharges between specialty and community hospitals is small. Referral patterns among physician owners are mixed. In some markets, there is a clear preference for owners to discharge their Medicare patients from the specialty hospitals (Dayton Heart Hospital, Oklahoma Heart, and Health Park). In other cases, the preference of physician owners is for the community hospital (both orthopedic hospitals).

4.4.4 Physician Ownership Shares and Self-Referrals

We next refine our analysis by focusing just on physician owners. We ask the question: Are physician owners who have the largest ownership shares most likely to refer patients to their

own specialty hospital? The next three tables stratify physician owners into low, medium, and high ownership groups and displays how they distribute themselves in terms of specialty hospital referral rates.

Cardiac. Of the 43 physician owners of cardiac specialty hospitals with a positive ownership share of less than one half of one percent, three out of four (77 percent) did not treat any patients at their specialty hospital, and only 1-in-10 referred more than half their patients there (***Table 4-5***). By contrast, nearly one-half of physician owners with a one percent or larger share treated more than half of their cardiac patients at their own specialty hospital. Even still, owners with higher shares still tended to see half or more of their patients in local competitor hospitals, and there is no evidence that concentration of self-referrals continues to increase beyond a small ownership percentage.

Table 4-5
Physician ownership and referral shares to specialty hospitals: cardiac

Physician	Percent of physician owner referrals to specialty hospitals				Number (%)
Ownership Percentage	0%	1-50%	51-99%	100%	owners
<.5%	33	6	2	2	43 (33%)
.5 - 1%	6	13	18	4	41 (32)
> 1%	9	16	12	9	46 (35)
Number (%) physician owners	48 (37%)	35 (27%)	32 (25%)	15 (12%)	130 (100%)

Orthopedic. Of the 21 physician owners of orthopedic specialty hospitals with a share of less than half of a percent, two out of three did not treat any patients at their specialty hospital while two (10 percent) treated more than half of their patients at their specialty hospital (***Table 4-6***). Of the 19 physicians with greater than a five percent ownership share, 4-in-5 treated more than half of their orthopedic patients at their specialty hospital. One-quarter of these physicians treated all of their orthopedic patients at their specialty hospital. These results suggest that only physicians with the largest shares treat most of their patients at their specialty hospital.

Table 4-6
Physician ownership and referral shares to specialty hospitals: orthopedic

Physician Owners -- percent	Percent of MD referrals to specialty hospitals				Number (%)
Ownership	0%	1-50%	51-99%	100%	Owners
0 - .5%	14	5	1	1	21 (21%)
.5 – 1%	12	7	1	0	20 (20%)
1 - 5%	20	10	7	1	38 (39%)
> 5%	2	2	10	5	19 (19%)
Number (%) referring MDs	48 (49%)	24 (24%)	19 (19%)	7 (7%)	98 (100%)

Surgical. Six of the seven physician owners of surgical specialty hospitals that had a share of less than one percent did not treat any of their surgical patients at their specialty hospital (***Table 4-7***). Of the seven physician owners with shares five percent or greater, three treated more than half of their patients at their specialty hospital.

Table 4-7
Physician ownership and referral shares to specialty hospitals: surgical

Physician owners -- percent	Percent of MD referrals to specialty hospitals				Number (%)
Ownership	0%	1-50%	51-99%	100%	owners
0 - 1%	6	1	0%	0%	7 (22%)
1 - 5%	13	1	2	2	18 (56%)
> 5%	2	2	3	0	7 (22%)
Number (%) referring MDs	21 (66%)	4 (13%)	5 (16%)	2 (6%)	32 (100%)

The results shown in the Tables 4-5 through 4-7 indicate a positive correlation between ownership share and the concentration of referrals in the specialty hospital. The zero-order Pearsonian correlation coefficient, weighted by the number of discharges, was 0.17 for cardiac specialty owners, which was statistically significant at the 10 percent level. For the orthopedic physician owners, the correlation was 0.62; statistically significant at the 1 percent level. For the surgical physician owners, the correlation was 0.77; also statistically significant at the 1 percent level. Visual inspection of the data, however, indicates a general non-linearity in the ownership-referral relationship. Especially in orthopedic and surgical specialty hospitals, it is only a few physicians with sizable ownership shares that concentrate their referrals in their own facility. This tends to be less the case with the several "sizable" owners in cardiac specialty hospitals—possibly because their ownership share is still quite small (i.e., about 1 percent).

4.5 Referral Acuity in Specialty versus Competitor Hospitals and Among Owners versus Non-owners

We next address the second research question of whether specialty hospitals and physician owners systematically treat a less sick group of Medicare patients than their peer competitors? We begin with a "national" analysis of the kinds of diagnostic groups, or DRGs, that are the focus of specialty hospitals across all markets in 2003. Next, we display patient severity rates within each specialty hospital group and major DRG. Third, we decompose each group's overall severity rate into a within-DRG and a cross-DRG component to test how much of the difference is due to patient selection for a procedure or condition and how much is due to case-mix specialization. We conclude Section 4.5 with an analysis of severity rates between physician owners and non-owners in each of the six cities we visited.

4.5.1 Overall Case-mix Concentration & Severity

To determine whether specialty hospitals do in fact treat a narrow range of focused diseases, we used CY2003 Medicare claims for 70 physician-owned specialty hospitals to

identify their major "lines of business." ***Table 4-8*** shows the classification of patients treated at cardiac, orthopedic, and surgical physician-owned specialty hospitals by major diagnostic categories (MDCs). For each type of physician-owned specialty hospital, the five most frequent patient MDCs are shown. Over 4-out-of-5 patients treated in cardiac and orthopedic physician-owned specialty hospitals are in MDCs 5 (circulatory system) and 8 (musculoskeletal system and connective tissue), respectively. This is not surprising as these two specialty groups had to have at least 45 percent of their cases in either MDC. By contrast, patients treated in surgical physician-owned specialty hospitals are much more diverse with three MDCs accounting for only about 50 percent of hospitalizations; namely, MDC 8 with 30.9 percent, MDC 6 (digestive system) with 12 percent, and MDC 13 (female reproductive system) with 10.3 percent.

All three types of physician-owned specialty hospitals have a surgical orientation. In cardiac physician-owned specialty hospitals, two-thirds of all hospitalizations (discharges) were surgical and 7-in-10 cardiac (MDC 5) hospitalizations were in surgical DRGs. In orthopedic specialty hospitals, well over 9-in-10 hospitalizations were surgical while "only" 7-in-10 hospitalizations in surgical specialty hospitals involved surgical DRGs.

Next, we compared the complexity of specialty and competitor patients within the MDC groups emphasized by the specialty hospitals. The 18 cardiac physician-owned specialty hospitals had 30,700 MDC 5 discharges during 2003 (***Table 4-9***), and their 98 local competitors had 153,721 MDC 5 discharges – a market share of nearly 17 percent for the physician-owned specialty hospitals.[15] The 40 orthopedic specialty hospitals had 6,699 MDC 8 discharges during 2003, and their 189 competitors had 100,529 MDC 8 discharges – a market share of about six percent for the physician-owned specialty hospitals. The 12 surgical physician-owned specialty hospitals had 495 discharges in their eight most-frequent DRGs during 2003, and their 31 competitors had 4,185 discharges – a market share of about ten percent for the physician-owned specialty hospitals.

The 18 physician-owned cardiac specialty hospitals had 23.3 percent of their discharges in the major or extreme classes while their competitor hospitals had 29.5 percent their discharges in the higher severity groups. The difference of 6.2 percentage points is statistically significant at the one percent level using a z-test of significance differences. The percentages were almost reversed for patients in the minor severity classification.

Orthopedic specialty hospitals had almost no (0.2 percent) discharges in the most severe class while their competitors had 2.1 percent. Orthopedic specialty hospitals had 6.3 percent of their discharges in the major or extreme classes compared with 22.9 percent among their peer competitors, a rate over triple that experienced in physician-owned specialty hospitals. Orthopedic physician-owned specialty hospitals had over half of their MDC 8 discharges in the least severe class versus 3-in-10 for their competitors.

15 The 2003 claims file contains nearly a half million claims in MDC 5. Most of these claims are in general hospitals in cities (e.g., Chicago) in which there is not a cardiac specialty hospital. Since such general hospitals are not competitors to cardiac physician-owned specialty hospitals, the claims from such general hospitals were excluded from the analyses.

Table 4-8
Discharges in the top 5 major diagnostic categories in specialty hospitals, 2003

		All discharges		Type of discharge			
				Medical discharges		Surgical discharges	
MDC	Description	Number of discharges	Share of total discharges	Discharges	Share of MDC	Discharges	Share of MDC
Cardiac specialty hospitals (18)							
05	Circulatory system	30,700	82.0%	9,371	30.5%	21,329	69.5%
01	Nervous system	2,344	6.3	536	22.9	1,808	77.1
04	Respiratory system	1,510	4.0	1,291	85.5	219	14.5
11	Kidney and urinary tract	785	2.1	289	36.8	496	63.2
06	Digestive system	583	1.6	477	81.8	106	18.2
	Other	1,504	4.0	1,095	72.8	409	27.2
	Total	37,426	100.0	13,059	34.9	24,367	65.1
Orthopedic specialty hospitals (40)							
08	Musculoskeletal system and connective tissue	6,699	83.5	137	2.0	6,562	98.0
13	Female reproductive system	243	3.0	0	0.0	243	100.0
06	Digestive system	196	2.4	69	35.2	127	64.8
01	Nervous system	124	1.5	40	32.3	84	67.7
12	Male reproductive system	124	1.5	4	3.2	120	96.8
	Other	636	7.9	246	38.7	390	61.3
	Total	8,022	100.0	496	6.2	7,526	93.8
Surgical specialty hospitals (12)							
08	Musculoskeletal system and connective tissue	438	30.9	32	7.3	406	92.7
06	Digestive system	170	12.0	69	40.6	101	59.4
13	Female reproductive system	146	10.3	0	0.0	146	100.0
12	Male reproductive system	134	9.4	2	1.5	132	98.5
05	Circulatory system	109	7.7	67	61.5	42	38.5
	Other	422	29.7	208	49.3	214	50.7
	Total	1,419	100.0	378	26.6	1,041	73.4

SOURCE: Medicare IPPS claims, CY2003.

Table 4-9
Distribution of discharges by severity of illness by type of specialty hospital and their competitors, 2003

	Number		Admissions severity				Percent
	Hospitals	Discharges	Minor	Moderate	Major	Extreme	Major-extreme
Cardiac (MDC 5)							
Specialty	18	30,700	29.7%	47.0%	19.7%	3.6%	23.3%
Competitor	98	153,721	23.8	46.7	23.9	5.7	29.5***
Total	116	184,421	24.8	46.7	23.2	5.3	28.5
Orthopedic (MDC 8)							
Specialty	40	6,699	55.9	37.8	6.1	0.2	6.3
Competitor	189	100,529	30.1	47.0	20.8	2.1	22.9***
Total	229	107,228	31.7	46.4	19.9	2.0	21.8
Surgery[1]							
Specialty	12	495	59.0	32.9	8.1	0.0	8.1
Competitor	31	4,185	36.7	45.3	16.9	1.1	18.0***
Total	43	4,680	39.1	44.0	16.0	1.0	17.0

NOTE: [1]Includes 8 most common DRGs: 209, 337, 356, 358, 359, 499, 500.
***Statistically significant at the 1% level.

SOURCE: Medicare IPPS claims, CY2003.

Surgical specialty hospitals had 8.1 percent of their discharges in the major or extreme classes compared with 18 percent among their competitors, a rate more than twice that experienced in physician-owned specialty hospitals. Six-in-10 discharges from surgical specialty hospitals were of minor severity versus slightly over 1-in-3 for their competitors in the same 8 DRGs.

Table 4-10 shows the distributions of the major/extreme discharge shares for peer competitor and physician-owned specialty hospitals.[16] The shares for cardiac specialty hospitals range from a minimum of 13.0 percent to a maximum of 38.8 percent and from 19.1 percent to 47.1 percent for competitor hospitals. One-in-four cardiac specialty hospitals exhibited a major/extreme share of less than 16 percent compared with 23 percent for the lowest one-quarter of competitor hospitals. The top one-quarter of specialty hospitals discharged over 26 percent of their cases in the major/extreme category versus 32.2 percent for the top one-quarter of peer cardiac hospitals. The ranges of major/extreme shares for surgical discharges are similar.

The major/extreme shares for orthopedic specialty hospitals range from zero to 20.3 percent and from zero percent to 47.1 percent for competitor hospitals. The ranges for orthopedic surgical discharges are also similar. One-quarter of orthopedic specialty hospitals had major/extreme severity rates of 1.5 percent or less versus 19 percent or less among peer competitor hospitals. Conversely, none of the 40 orthopedic specialty hospitals had a major/extreme severity rate has high as the average rate among their competitors.

A market-by-market analysis revealed that most cardiac or orthopedic specialty hospitals had to lowest, or next to lowest, major/extreme severity rate in their market. It also showed considerable variation in major/extreme severity rates among competitors in a particular market. From this we can conclude that

- not all specialty hospitals are alike in their selection of patients, even accounting for specialty orientation, and
- it appears that favorable selection and referral of patients is widespread in the hospital industry as a whole.

16 Because of the small number (12) of surgical physician-owned specialty hospitals, the distribution of major/extreme shares is not shown.

Table 4-10
Distribution of major/extreme rates: cardiac & orthopedic specialty and competitor hospitals

	Cardiac (MDC5)		Orthopedic (MDC8)	
Statistics	Competitor	Specialty	Competitor	Specialty
All Cases				
N. of Hospitals	98	18	189	40
Mean %	29.0%	23.3%	22.7%	5.1%
Std. Dev.	5.5	6.9	5.4	4.8
Minimum	19.1	13.0	0.0	0.0
Bottom 10%	23.0	15.9	15.7	0.0
Bottom 25%	25.0	18.2	19.0	1.5
Median %	28.1	22.6	23.2	3.2
Top 25%	32.2	26.3	26.4	7.9
Top 10%	37.6	34.2	28.8	12.3
Maximum	47.1	38.8	47.1	20.3
Surgical				
Mean %	30.9%	23.0%	22.8%	5.2%
Std. Dev.	7.3	7.5	5.8	5.0
Minimum	20.0	13.4	0.0	0.0
Bottom 10%	22.4	13.5	15.8	0.0
Bottom 25%	25.7	16.9	19.4	1.5
Median %	29.2	22.2	22.5	3.3
Top 25%	35.4	25.4	26.9	8.0
Top 10%	42.9	36.7	30.0	13.1
Maximum	51.2	38.0	39.2	20.6

NOTE:

SOURCE: Medicare Inpatient PPS claims, CY2003; Run 22, Y03MKS04.

Many local hospitals and physicians treating heart and orthopedic patients appear to be sending more complex patients to certain hospitals in their market—possibly in the patients' best interests but also possibly to avoid financial losses. Our results are consistent with the findings of GAO (2003) and MedPAC (2005).[17] Our results differ in showing how much variation there is in both specialty and peer hospitals. Thus, any differences in patient acuity based on averages should be carefully evaluated against the favorable patient selection already taking place within the acute general hospital industry in the same communities. Specialty hospitals are simply at the lower end of a severity continuum among local hospitals. It is also incorrect to view all physician-owned specialty hospitals as the same, even within their own cardiac, orthopedic, or surgical group, as we show later in this section.

4.5.2 Within-DRG Severity

To partially control for case-mix differences between specialty and competitor hospitals, we stratified severity rates by DRG.

Cardiac. There were 15 DRGs that were most frequently treated by physician-owned cardiac specialty hospitals and their competitors (***Table 4-11***).[18] The column labeled "Top 10" indicates whether the DRG was among the 10 most-frequently treated DRGs in cardiac physician-owned specialty hospitals or their competitors. Seven of cardiac specialty hospitals' top 10 DRGs were surgical while six of the competitors' top 10 DRGs were medical. For both the cardiac physician-owned specialty hospitals and their competitors, the total number of discharges in each DRG and the share in the major/extreme class are shown. The last column of the table shows the ratio of competitor-to-specialty major/extreme shares. A ratio greater than 1.0 indicates that the competitor hospitals had a higher share of major/extreme cases than the physician-owned specialty hospitals for a particular DRG.

Over all fifteen DRGs, competitor hospitals had major/extreme shares that were 32 percent higher than in cardiac specialty hospitals. Twelve of the 15 DRGs have ratios greater than 1.0 (9 ratios statistically significant). (No ratios less than 1.0 were statistically significant.)

Taking DRG 107, bypass surgery with diagnostic catheterization, as an example, the ratio of 1.18 indicates that the share of major/extreme cases was 18 percent higher in competitor hospitals (43 percent) than in cardiac specialty hospitals (36 percent). These results support the

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[17] Our results are seemingly inconsistent with the findings presented in the Lewin & Associates' Executive Summary of their MedCath report (May 2003 and February 2004). That report showed a more "severe" overall case mix for the MedCath heart hospitals compared with their competitors. Their result was derived using charge-based weights for the four severity categories within each APR-DRG. Uniformly higher charge weights are assigned to surgical versus medical cases. Given the surgical orientation of physician-owned cardiac specialty hospitals, it is not surprising that their case mix index is higher than for competitor hospitals. This does not mean that their case-mix severity (complexity) is greater within an APR-DRG or DRG, which is of primary policy concern. Peer competitors as well as specialty hospitals are paid more by Medicare for surgical patients in the same DRG. It is of particular interest to know whether physicians refer patients to specialty or community hospitals based on their within-DRG acuity.

[18] Two additional DRGs were added to the list for a total of 15 DRGs. DRG 139 was added to the list since it the less complicated version of DRG 138. DRG 526 was added as a complicated version of DRG 527.

Table 4-11
Cardiac discharges[1] by DRG, specialty/competitor status, and severity of illness, 2003

DRG	Type	Description	Top 10	Cardiac specialty hospitals: Discharges	Cardiac specialty hospitals: Share maj/ext	Competitor hospitals: Discharges	Competitor hospitals: Share maj/ext	Ratio of competitor to specialty maj/ext rates
107	SURG	Coronary bypass w cardiac cath	B	1,372	36.0%	5,064	42.6%	1.18 ***
109	SURG	Coronary bypass w/o ptca or cardiac cath	S	1,812	28.9	3,524	29.9	1.04
116	SURG	Other permanent cardiac pacemaker implant	B	1,674	9.7	6,356	15.1	1.56 ***
121	MED	Circulatory disorders w ami & major comp, discharged alive	C	591	62.9	5,010	66.1	1.05
124	MED	Circulatory disorders except ami, w card cath & complex diag	B	1,505	38.9	6,631	44.9	1.16 ***
125	MED	Circulatory disorders except ami, w card cath w/o complex diag	B	1,501	4.3	5,510	5.1	1.17
127	MED	Heart failure & shock	B	1,874	31.0	25,173	30.6	0.99
138	MED	Cardiac arrhythmia & conduction disorders w cc	C	1,023	28.0	7,542	35.8	1.28 ***
139	MED	Cardiac arrhythmia & conduction disorders w/o cc		496	1.0	3,219	0.7	0.64
143	MED	Chest pain	C	649	10.5	9,699	10.2	0.97
478	SURG	Other vascular procedures w cc	B	1,649	18.1	5,979	37.4	2.06 ***
517	SURG	Perc cardio proc w non-drug eluting stent w/o AMI	B	4,310	10.6	11,152	12.5	1.18 ***
518	SURG	Perc cardio proc w/o coronary artery stent or AMI	S	1,378	18.0	3,280	22.8	1.27 ***
526	SURG	Percutneous cardiovasular proc w drug eluting stent w AMI		280	17.9	1,079	23.3	1.30 *
527	SURG	Percutneous cardiovasular proc w drug eluting stent w/o AMI	S	1,876	8.4	4,873	10.3	1.23 **
		Totals		**21,990**	**19.8**	**104,091**	**26.2**	**1.32** ***

NOTE: [1]Most-frequently treated cardiac DRGs in cardiac hospitals
Top 10 S – Specialty hospital only
C – Competitor hospital only
B – Both
a blank denotes a paired DRG

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare Inpatient PPS claims, CY2003; Run 22, Y03MKS04.

hypothesis that, on average, cardiac specialty hospitals treat patients that have fewer complications and comorbidities than their competitors.

Orthopedic. There were 16 DRGs that were most frequently treated by orthopedic physician-owned specialty hospitals and their competitors (***Table 4-12***). All of orthopedic physician-owned specialty hospitals' top 10 DRGs were surgical while three of the competitors' top 10 DRGs were medical. All but one of the major/extreme ratios between competitor and orthopedic specialty hospitals were greater than 1.0. All except two DRGs had ratios greater than two. An additional three ratios could not be calculated because no patients were discharged in the major/extreme classes in physician-owned specialty hospitals.

Surgical. Because the major/extreme share of discharges was equal to zero for all but three DRGs treated in surgical specialty hospitals (***Table 4-13***), only three ratios could be calculated. All three were greater than 1.0. Only DRG 209, major joint procedures, had a large enough sample to show a statistical difference (34 percent).

4.5.3 Within and Across-DRG Decomposition of Severity

The lower overall severity rate of specialty hospitals compared with their peers may be due, in part, to systematic differences in the kinds of procedures and illnesses they perform and treat (i.e., a case-mix "specialization" difference) and partly to differences within DRGs (i.e., favorable selection). For policy makers, it is valuable to know how much of the patient severity difference between specialty and competitor hospitals is due to (a) the specialized procedures and patients they are admitting, and (b) how much to the selection of less severe cases (if any) undergoing such procedures. Lower severity rates due to procedure mix may imply a different policy response than if lower rates are primarily due to favorable selection. In this section, we isolate the effects of case mix and with-DRG severity on specialty–competitor severity rates.

First, we constructed and decomposed a relative severity index for each hospital. This index is the ratio of the hospital's actual patient severity rate (SR_h) to the "national" severity rate (SR_n)[19] for all hospitals in a particular class (e.g., cardiac, orthopedic):

(1) $$SI_h = \text{Actual } SR_h / \text{National } SR_n .$$

Hospital-specific and national severity rates are defined as the count of discharges in a particular MDC that are classified in the 3M APR-DRG system as major or extreme divided by all discharges in the MDC. Hospitals with a higher severity index discharge a greater-than-average percent of their patients in the major or extreme illness categories within an MDC. A hospital severity index equal to 1.0 implies that its major/extreme share of MD discharges is identical to the national average.

Each hospital's severity index can be decomposed into a within ($WIDRGSI_h$) and a cross-DRG ($XDRGSI_h$) component:

(2) $$SI_h = \sum_d f_{dh}SR_{dh} / \sum_d f_{dn}SR_{dn} = WIDRGSI_h * XDRGSI_h$$

(3) $$WIDRGSIh = \sum d\ fdhSRdh / \sum d\ fdhSRdn$$

(4) $$XDRGSIh = \sum d\ fdhSRdn / \sum d\ fdnSRdn$$

[19] The set of "National" hospitals includes both specialty hospitals and their local competitors for 2003. Hospitals in a particular class (e.g., cardiac) in cities without a specialty hospital (e.g., Boston) are excluded.

Table 4-12
Orthopedic discharges[1] by DRG, specialty/competitor status, and severity of illness, 2003

DRG	Type	Description	Top 10	Orthopedic specialty hospitals: Discharges	Orthopedic specialty hospitals: Share maj/ext	Competitor hospitals: Discharges	Competitor hospitals: Share maj/ext	Ratio of competitor to specialty maj/ext rates	
209	SURG	Major joint & limb reattachment procedures of lower extremity	B	3,019	10.2%	35,649	25.2%	2.47	***
210	SURG	Hip & femur procedures except major joint age >17 w cc	C	22	31.8	9,069	38.1	1.20	
211	SURG	Hip & femur procedures except major joint age >17 w/o cc	C	26	0.0	2,201	2.9	---	
218	SURG	Lower extrem & humer proc except hip, foot, femur age >17 w cc	C	47	2.1	1,975	20.0	9.39	***
219	SURG	Lower extrem & humer proc except hip, foot, femur age >17 w/o cc	S	126	0.8	1,556	0.7	0.90	
224	SURG	Shoulder, elbow or forearm proc, exc major joint proc, w/o cc	S	131	0.0	756	0.1	---	
236	MED	Fractures of hip & pelvis	C	12	8.3	2,886	31.3	3.75	
239	MED	Pathological fractures & musculoskeletal & conn tiss malignancy	C	3	0.0	2,833	36.3	---	
243	MED	Medical back problems	C	46	2.2	6,875	15.3	7.05	**
471	SURG	Bilateral or multiple major joint procs of lower extremity	S	112	7.1	1,002	14.6	2.04	**
491	SURG	Major joint & limb reattachment procedures of upper extremity	S	226	0.9	1,514	4.9	5.56	***
496	SURG	Combined anterior/posterior spinal fusion	S	224	9.8	408	48.8	4.97	***
497	SURG	Spinal fusion except cervical w cc	B	185	6.5	2,217	21.2	3.27	***
498	SURG	Spinal fusion except cervical w/o cc	S	375	0.0	1,578	1.0	---	
499	SURG	Back & neck procedures except spinal fusion w cc	B	255	4.3	3,474	14.1	3.27	***
500	SURG	Back & neck procedures except spinal fusion w/o cc	B	883	0.2	4,979	0.4	1.57	
		Totals		**5,692**	**1.2**	**78,972**	**10.6**	**8.53**	***

NOTE: [1] Most-frequently treated orthopedic DRGs in orthopedic specialty hospitals and their competitors

Top 10 S - Specialty hospital only
C - Competitor hospital only
B – Both

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims, CY2003.

Table 4-13
Surgery discharges[1] by DRG, specialty/competitor status, and severity of illness, 2003

				Surgical specialty hospitals		Competitor hospitals		Ratio of competitor to specialty maj/ext rates
DRG	MDC	Type	Description	Discharges	Share maj/ext	Discharges	Share maj/ext	
209	08	SURG	Major joint & limb reattachment procedures of lower extremity	214	17.8%	2,888	23.8%	1.34*
336	12	SURG	Transurethral prostatectomy w cc	31	3.2	156	5.1	1.59
337	12	SURG	Transurethral prostatectomy w/o cc	76	0.0	106	0.0	---
356	13	SURG	Female reproductive system reconstructive procedures	52	0.0	142	0.7	---
358	13	SURG	Uterine & adnexa proc for non-malignancy w cc	8	0.0	116	13.8	---
359	13	SURG	Uterine & adnexa proc for non-malignancy w/o cc	56	0.0	203	0.0	---
499	08	SURG	Back & neck procedures except spinal fusion w cc	14	7.1	264	15.5	2.18
500	08	SURG	Back & neck procedures except spinal fusion w/o cc	44	0.0	310	0.0	---
			Totals	**495**	**8.1**	**4,185**	**18.0**	**2.23**

NOTE: [1]Most-frequently treated surgical DRGs in surgical specialty hospitals.
***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims, CY2003.

where f_{dh}, f_{dn} = the proportion (frequency) of discharges in the d-th DRG in hospital (h) or national (n), and SR_{dh}, SR_{dn} = the corresponding average severity rates in h and n within each DRG. The within-DRG severity index can be interpreted as the hospital's actual severity rate divided by its expected rate given its DRG mix. Its expected rate is derived as a weighted average of its own DRG frequencies using the national (full sample) DRG-specific severity rates as weights. A hospital's within-DRG ratio differs from 1.0 to the extent that its own within-DRG severity rates differ from the national rates. The cross-DRG index is interpreted as the hospital's expected to the national severity rate. This ratio differs from 1.0 to the extent that the hospital's DRG case mix differs from the national rate.

If a hospital's within-DRG index equals 1.0, then any deviation in its overall severity index from the national index is due to a case-mix difference, and vice-versa, it would be due to a within-DRG severity difference if the cross-DRG index were 1.0. Thus, a hospital could have a higher-than-average overall severity index because (a) its within-DRG severity is above average, (b) the cases and procedures it concentrates on generally involve above average rates of major/extreme patients, or (c) both. A small interaction term, or residual, also exists that accounts for the fact that both indexes multiply and build on one another. The interaction term is approximately zero when both the within- and the cross-DRG deviations from 1.0 are small.

Cardiac. ***Table 4-14*** presents severity indices for the 18 cardiac specialty hospitals and their 98 local competitors for 2003. The overall severity rates of the two groups are the same as shown in Table 4-9, i.e., .295 versus .233. Overall, cardiac competitors have a 27 percent higher severity rate compared with specialty hospitals. The last two columns show that 6-tenths of the difference is due to within-DRG severity differences—17 percentage points—and 3–tenths to the types of cases specialty hospitals concentrate on—8 percentage points. Both component ratios are greater than 1.0 implying that cardiac specialty hospitals admit MDC 5 patients in DRGs with somewhat lower severity rates, in general. Moreover, patients within each DRG exhibit lower severity, or complexity, as well.

Table 4-15 ranks the ten cardiac DRGs with the largest differences in specialty–competitor case mix by their national DRG severity rate.[20] DRG 127, heart failure, shows the largest difference in specialty case mix. Only 6.1 percent of specialty discharges were in this DRG versus 14.67 percent of competitor discharges. This large discrepancy, however, is not a major reason for specialty hospitals' lower cardiac case-mix severity because this DRG's severity rate (30.62%) is very similar to the overall average severity rate of about 29 percent.[21] For a DRG to be a major source of severity differences between specialty and competitor hospitals, it must have both a large difference in frequency as well as a mean severity rate well above or below average. What appears to drive their slightly lower case-mix severity is the emphasis specialty hospitals place on PTCA surgery, which tends to involve relatively few major/extreme

[20] See Appendix Table 4-A.1 for a listing of all MDC 5 DRGs along with their severity rates and specialty-competitor discharge frequencies.

[21] The top 3 MDC5 DRGs with the highest rates of major/extreme cases were: 535(defibrillator implant, 87% major/extreme, +.3% more cases in specialty hospitals); 129(cardiac arrest, 86%, -.06%); 123(AMI expired, 79%, -.4%). See Appendix Table 4-A.1 for full listing.

Table 4-14
Decomposition of specialty and competitor severity indices for MDC5 cardiac discharges[1], 2003

Hospital Type	Number of hospitals	Average discharges	Overall Severity rate	Overall severity index[2]	Within-DRG Severity Index[3]	Cross-DRG severity index[4]
Competitors[5]	98	1,569	.295	1.036	1.018	1.013
Specialty	18	1,706	.233	.818*	.871*	.936*
Ratio[6]	5.4	.9	1.27	1.27	1.17	1.08

NOTES:

[1]Indices based on severity rates of major/extreme discharges classified by 3M's APR-DRG System.

[2]Discharge–weighted average ratio of group's own actual severity rate to all providers.

[3]Discharge–weighted average ratio of group's own actual severity rate to its expected rate using average DRG rates for all providers.

[4]Discharge–weighted average ratio of group's expected rate to severity rate for all providers.

[5]Includes all "major" heart competitors in 16 markets with a cardiac specialty hospital with 2003 claims.

[6]Ratio = competitor/specialty rate.

* = Specialty rate significantly different at 5% level.

SOURCE: Medicare IPPS claims, 2003; CARD03D-4.04.05.

Table 4-15
Frequencies and severity rates for 10 DRGs with the largest difference in national versus specialty frequencies, 2003: cardiac

DRG	Description (S,M)[3]	Specialty frequency	National frequency[1]	Difference	National severity rate[2]
144	Other disorders w/ cc (M)	0.62%	2.65%	-2.03%	53.31%
130	Vascular disorders w/ cc (M)	0.77	2.04	-1.27	36.88
127	Heart failure (M)	6.10	14.67	-8.57	30.62
109	Bypass w/o cath (S)	6.10	2.89	3.21	29.57
141	Syncope w/ cc (M)	0.52	2.34	-1.82	23.27
518	PTCA w/o AMI w/o stent (S)	4.49	2.53	1.96	21.38
517	PTCA w/o AMI w/ stent (S)	14.04	8.38	5.66	11.98
143	Chest pain (M)	2.11	5.61	-3.50	10.22
527	PTCA w/o AMI w/ eluting stent (S)	6.11	3.66	2.45	9.74
479	Vascular procedures w/o cc (S)	2.85	1.40	1.45	2.29

NOTE:

[1]National = All 116 cardiac hospitals in cities with a specialty heart hospital in 2003.

[2]Severity rate = % classified as major/extreme.

[3]S= surgery; M= medical

SOURCE: Medicare IPPS claims, 2003; CARD03D-4.04.05

patients. Case-mix severity for these kinds of procedures range from 10-21 percent, which is well below the national average DRG severity rate in MDC5.

Orthopedic. Table 4-16 shows severity indexes for all 40 orthopedic specialty hospitals and their 189 competitors. Competitors' overall severity index was 3.6-times that of the specialty hospitals. Both the within- and cross-DRG indexes were also greater for competitors. The simpler DRG mix of orthopedic specialty hospitals directly contributed slightly less than 2-tenths (40 of 263 percentage points) to the difference in their overall index. Lower within-DRG severity of specialty hospitals contributed nearly 7-tenths (179 of the 263 points) to the difference. The remaining 44-point difference is due to the positive interaction of case mix and within-DRG severity.

Table 4-16
Decomposition of specialty and competitor severity indices for MDC8 orthopedic discharges[1], 2003

Hospital Type	Number of hospitals	Average discharges	Overall		Within-DRG severity index[3]	Cross-DRG severity index[4]
			Severity rate	severity index[2]		
Competitors[5]	189	532	.229	1.047	1.028	1.018
Specialty	40	167	.063	.289*	.369*	.729*
Ratio[6]	5.4	3.78	3.63	3.63	2.79	1.40

NOTES:

[1]Indices based on severity rates of major/extreme discharges classified by 3M's APR-DRG System.

[2]Discharge–weighted average ratio of group's own actual severity rate to all providers.

[3]Discharge–weighted average ratio of group's own actual severity rate to its expected rate using average DRG rates for all providers.

[4]Discharge–weighted average ratio of group's expected rate to severity rate for all providers.

[5]Includes all "major" orthopedic competitors in 29 markets with an orthopedic specialty hospital with 2003 claims.

[6]Ratio = competitor/specialty rate.

* = Specialty rate significantly different at 5% level.

SOURCE: Medicare IPPS claims, 2003; ORTHO3D-4.04.05.

Table 4-17 ranks the ten orthopedic DRGs with the largest differences in specialty–competitor case mix by the national DRG severity index.[22] DRG 209, major joint (hip and knee) surgery, dominates both the absolute and relative frequencies within and between groups. Orthopedic specialty hospitals have a much higher concentration of these procedures than do their competitors, but because DRG 209's severity (24%) is quite similar to the overall national average of 22 percent, this concentration has only a modest effect on severity differences.[23] It is the concentration of several specialty hospitals on spine and back and neck surgery that contributes at least twice as much to their lower overall severity index of specialty hospitals relative to their competitors. The one exception to this is DRG 496, combined spinal fusions, which exhibits considerably higher rates of major/extreme cases across all hospitals and is more common in specialty hospitals.

Table 4-17
Frequencies and severity rates for 10 DRGs with the largest difference in national versus specialty frequencies, 2003: orthopedics

DRG	Description (S,M)[3]	Specialty frequency	National frequency[1]	Difference	National severity rate[2]
210	Hip/femur except major joint(S)	0.74%	8.48%	-7.74%	38.07%
216	Biopsies(S)	4.32	0.99	3.33	37.85
496	Combined anterior/posterior spinal fusion(S)	6.94	0.59	6.35	34.97
209	Major joint, lower extremity	50.90	36.06	14.84	23.98
243	Medical back problems (M)	1.50	6.45	-4.95	15.22
471	Bilateral/multiple major joint, lower extremity(S)	3.42	1.04	2.38	13.82
491	Major joint, upper extremity(S)	3.96	1.62	2.34	4.37
498	Spinal fusion except cervical w/o cc(S)	7.02	1.82	5.20	0.77
500	Back/neck procedures, w/o cc(S)	14.53	5.47	9.06	0.34
520	Cervical spinafusion w/o cc	3.99	1.43	2.56	0.13

NOTE:

[1]National = All 229 orthopedic hospitals in cities with an orthopedic specialty hospital in 2003.

[2]Severity rate = % classified as major/extreme.

[3]S= surgery; M= medical

SOURCE: Medicare IPPS claims, 2003; CARD03D-4.04.05

22 See Appendix Table 4-A.2 for a listing of all MDC8 DRGs along with their severity rates and specialty–competitor discharge frequencies.

23 The top 3 most severe MDC8 DRGs were: 233 (other O.R. procedures w/cc, 75%, -.42%; 217 (skin graft, 53%,-.62%); 238 (osteomylitis, 48%, -.03%). See Appendix Table 4-A.2 for full listing.

4.5.4 Severity of Referrals by Physician Ownership

The results so far imply that physicians are treating somewhat less severe and therefore more profitable patients for treatment in physician-owned specialty hospitals. In order to assess the importance of physician ownership on patient severity, we analyzed the severity of discharges by physician ownership categories for each of the six cities we visited.

Cardiac. For cardiac discharges in the Dayton market, the ratios for both non-owners and small owners were less than 1.0 and statistically significant at the one percent level (***Table 4-18***). That is, both non-owners and small owners had a higher share of major/extreme cases at the cardiac specialty hospital than at the local competitor hospitals.

Table 4-18
Cardiac discharges by physician-ownership status and severity rate in three cities, 2003

	Non-owners		Small owners		Large owners	
	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital
Dayton						
Discharges	8,205	456	669	1,344	n/a	n/a
Major/extreme %	29.9%	41.9%***	29.9%	37.8%***	n/a	n/a
Ratio of competitor To specialty	0.7		0.8		n/a	
Fresno						
Discharges	3,477	8	1,340	54	1,105	115
Major/extreme %	30.1%	12.5%	16.3%	22.2%	15.0%	8.7%*
Ratio of competitor To specialty	2.4		0.7		1.7	
Oklahoma City						
Discharges	10,903	643	955	1,357	32	1,538
Major/extreme %	27.0%	20.4%***	25.0%	22.3%	34.4%	21.2%
Ratio of competitor To specialty	1.3		1.1		1.6	
Tucson						
Discharges	5,865	653	866	963	n/a	n/a
Major/extreme %	27.9%	24.2%*	21.3%	18.4%	n/a	n/a
Ratio of competitor To specialty	1.2		1.2		n/a	

NOTE: n/a: not applicable because there are no "big" owners.

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims.

Dayton Heart Hospital (DHH) is the second oldest MedCath facility. As a specialty hospital matures, its range of services and ability to treat more severe cases may expand. In Fresno, the severity ratio for small owners at FHH was also less than 1.0; yet, the ratio was 1.7 for big owners, indicating a higher share of major/extreme cases at the local competitor hospitals. FHH specialty hospital had been opened only two months, giving a different picture than DHH. In Oklahoma City, while all three ratios were greater than one, only the difference for the non-owners was statistically significant. In Tucson, both ratios were greater than one, but only the difference for non-owners was statistically significant. Except for Dayton, the ratios for cardiac hospitals tend to be greater than one. However, many of the differences between major/extreme shares are not statistically significant, usually because of small sample sizes.

Orthopedic. For orthopedic discharges, all but one ownership ratio is greater than one (***Table 4-19***). The highest ratios for owners were in Oklahoma City. As with the cardiac cases, small sample sizes are partly responsible for the fact that some differences are not statistically significant. The fact that non-owners have ratios as high -- or higher -- than for owners might be because patients of non-owners might need to be authorized by the specialty hospital prior to admission. Another possible explanation is that non-owners may not be as familiar with the facilities and personnel at the specialty hospital and, thus, are reluctant to treat their most severe cases there.

Table 4-19
Orthopedic discharges by physician-ownership status and severity rate In three cities, 2003

	Non-owners		Small owners		Big owners	
	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital
Fresno						
Discharges	1,500	84	620	199	4	0
Major/extreme %	26.5%	1.2%***	19.5%	10.1%***	25.0%	0.0%
Ratio of competitor To specialty	22.2		1.9		---	
Oklahoma City						
Discharges	5,953	290	209	48	104	220
Major/extreme %	20.3%	4.5%***	25.4%	2.1%***	12.5%	2.7%***
Ratio of competitor To specialty	4.5		12.2		4.6	
Rapid City						
Discharges	293	8	533	306	2	72
Major/extreme %	33.1%	37.5%	22.7%	9.5%***	50.0%	5.6%
Ratio of competitor To specialty	0.9		2.4		9.0	

NOTE:

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims.

Surgical. For the surgical specialty hospitals and their competitors, the differences in the shares of major/extreme cases are statistically significant for only the small owners in Hot Springs (***Table 4-20***). As with both cardiac and orthopedic cases, small sample sizes may account for the lack of statistical significance between major/extreme shares of specialty hospitals and their competitors by physician ownership class.

Table 4-20
Surgical discharges by physician-ownership status and severity rate in two cities, 2003

	Non-owners		Small owners		Big owners	
	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital
Hot Springs						
Discharges	416	21	57	94	42	114
Major/extreme %	14.2%	0.0%	22.8%	9.6%**	21.4%	26.3%
Ratio of competitor To specialty	---		2.4		0.8	
Rapid City						
Discharges	110	14	382	0	n/a	n/a
Major/extreme %	21.8%	0.0%	20.9%	0.0%	n/a	n/a
Ratio of competitor To specialty	---		---		n/a	

NOTE:

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims.

To compensate for small sample sizes and to avoid drawing generalizations from individual markets, we considered aggregating the results for the four cardiac markets, but decided against it. Aggregation produced misleading results (due to large differences in volumes) and can conceal significant variation in individual markets, especially when dealing with small numbers of markets or observations. On the other hand, it is important to avoid drawing generalizations from the individual markets, especially if the ones that we visited are not representative of specialty markets generally.

4.6 Transfers in Specialty and Competitor Hospitals

Transfers between specialty and community hospitals are of special policy interest because they represent an opportunity for facilities to transfer the burden of treating sicker patients to another facility. If physicians (and managers) in specialty hospitals are motivated by financial gain, they may transfer a higher proportion of sicker, more medically complex, patients to community hospitals than occurs in the industry as a whole. Systematic transfers of high acuity patients from specialty to community hospitals was cited by community hospital representatives during our site visit interviews as evidence of "cherry picking" by physician owners of specialty hospitals. Therefore, given the policy interest in this issue, we examined

transfers for all Medicare cases and not just those in which the physician-owned hospitals specialize.

4.6.1 Definition of Transfers

For this analysis, we used Medicare claims data on all specialty and competitor hospitals in 2003. There were too few transfers for meaningful analysis in the 6 cities we visited. **A transfer is counted if it is between any specialty or acute hospital and any other hospital within 20 miles of a specialty hospital in the area**.[24] The policy concern over "inappropriate" transfers extends to more than just between cardiac hospitals in a market. We seek to measure the level and severity of transfers from a specialty hospital to any other local hospital, not just its peer competitors. We also wish to benchmark specialty transfers against transfers naturally occurring among the many competitor hospitals.

A transfer from one acute care facility to another was operationally defined as any two claims for the same patient in which the admission date of the second claim is within one day of the discharge date of the first claim and the two hospital provider ID's do not match, i.e., not a readmit to the same hospital. This definition does not rely on the discharge destination reported on the claim but on what actually appears in the claims history file. Transfers are limited to a specialty hospital's geographic market and exclude transfers from one city to another city or rural area.[25]

The first claim from the "sending" hospital is considered a "transfer-out" while the second claim is coded as a "transfer-in." Thus, two transfer rates are calculated depending upon perspective: (1) transfer-out rates; and (2) transfer-in rates. The rates are not identical because specialty and general hospitals are not completely closed systems within a city. Acute general hospitals will have higher transfer-in than transfer-out rates because, as full-service facilities, they can treat more illnesses and would not have to transfer out as much. Practically all transfer-outs from specialty hospitals naturally go to general hospitals (as shown below).

A lack of transfers prevented an analysis of this issue for surgical specialty hospitals.

4.6.2 Cardiac & Orthopedic Transfers

Overall (within market) transfer rates for cardiac specialty and peer competitor hospitals are shown in ***Table 4-21***. For this table, "competitor" still refers to only those "peer" community hospitals focusing on cardiac care like the specialty hospital. However, the number of transfers they make (receive) involve other local hospitals and not just their peer competitors. The MDC 5 transfer-out rate for the 18 cardiac specialty hospitals was 1.1 percent, a rate almost identical to the rate for other local peer competitor cardiac hospitals with at least 15 major surgical cases. Transfer-in rates for both groups are higher than transfer-out rates as they receive cases from other local acute hospitals. Also, cardiac specialty hospitals transfer-in patients at nearly double the rate of other cardiac competitors (3.3% v. 1.8%). This may be due to their recognized

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[24] Transfers to and from outlying facilities within one day were excluded.

[25] Because all competitor hospitals are included in a market and not just "peer" competitors, the geographic market will be somewhat larger when two or three different types of specialty hospitals are admitting patients.

capability for cardiac surgery. It may also be due, in part, to owners first seeing patients in competitor hospitals then transferring patients later to their own hospital for surgery. A few competitor hospital staff we interviewed complained that owners were transferring patients out of their facilities to the nearby specialty hospital. Higher transfer-in rates may also be a natural flow of patients among specialty and general acute hospitals with joint ownership arrangements.

Table 4-21
Transfer Rates by Specialty and Competitor Hospitals, 2003

	Cardiac (MDC5)			Orthopedic (MDC8)		
	Discharges			Discharges		
	Total	Out/In	Rate	Total	Out/in	Rate
Transfers out						
Specialty	30,700	346	1.1%	6,699	112	1.7%***
Competitor	155,344	1,558	1.0	100,529	571	0.6
Transfers in						
Specialty	30,700	1,018	3.3%***	6,699	42	0.6%
Competitor	155,344	2,762	1.8	100,529	514	0.5

NOTES: *** Statistically significant p<.01 compared with competitors. Transfers based on discharge and admission dates within one day for same patient but different acute hospital.

SOURCE: Medicare IPPS Claims, CY2003; WPY03R12.

The transfer-out rate for orthopedic specialty hospitals, by contrast to cardiac specialty hospitals, was nearly three times that of local competitors (1.7% v. 0.6%). Transfer-in rates among orthopedic specialty and competitor hospitals were essentially identical.

Table 4-22 decomposes cardiac transfer-out rates by type of receiving hospital. The table also shows the percent of transfers that were classified as major/extreme severity. According to the first row of the table, acute general cardiac competitor hospitals transferred out 1,558 cases in MDC 5 to other hospitals within their local markets. Of these, 37.6 percent were major/extreme severity. They also transferred out an even higher rate of major/extreme cases in all other MDCs (48.6 percent). Cardiac specialty hospitals transferred out 346 cases in MDC 5 of which 43.1 percent were major/extreme, a statistically higher rate (at the 10% level) than the 37.6 percent among local general acute hospitals. Cardiac specialty hospitals also transferred out a small number (142) of non-MDC 5 cases with a slightly higher average severity than their MDC 5 transfers. The overall total transfer-out percent of major/extreme cases was not significant between acute general and cardiac specialty hospitals.

The majority of cardiac transfers occurred within local community hospitals, themselves, in markets with a cardiac specialty hospital. About one-quarter of competitor cardiac (MDC 5) hospital transfers were to local cardiac specialty hospitals. Of these, 37 percent were in the major/extreme category. Cardiac competitor hospitals transferred-out among themselves or other acute hospitals the same percent of major/extreme cases. Competitor hospitals also transferred a

small number (103) to specialty hospitals in non-cardiac MDCs that were somewhat more severe.

Table 4-22
Transfers-out (sender) from cardiac specialty and competitor hospitals, 2003

	Receiver hospital					
	All acute general		Specialty		Total	
Sender hospital	N	Major/ extreme	N	Major/ extreme	N	Major/ extreme
Competitor						
MDC5	1,131	37.8%	427	37.0%	1,558	37.6%
Other	1,564	48.3	103	53.4	1,667	48.6
Total	2,695	43.9	530	40.2	3,225	43.3
Specialty						
MDC5	346	43.1*	0	0.0	346	43.1*
Other	141	50.4	1	0.0	142	50.0
Total	487	45.2	1	0.0	488	45.1
Total	**3,182**	**44.1**	**531**	**40.2**	**3,713**	**43.5**
MDC5	1,477	39.1	427	37.0	1,904	38.6
Other	1,705	48.4	104	53.4	1,809	48.7

NOTE: *p<.10 compared with general acute hospitals. Transfers-out from a competitor or specialty hospital to any acute general or cardiac specialty hospital.

SOURCE: Medicare IPPS Claims, CY2003; WPY03R12.

Table 4-23 reports sources of cardiac transfers-in and the percent of patients who were major/extreme severity. The overall transfer-in rate of major/extreme cases to cardiac specialty hospitals (37.5%; see total row) is substantially less than the rate among peer competitor hospitals (47.8%; p< .01). Competitor hospitals received about 5 times the number of transfers-in as did their specialty competitor (5,337 v. 1,124). Of these, 178 in MDC 5 came from specialty hospitals with 48.9 percent major/extreme compared to 40.5 percent when admitted from other general hospitals (p<.01). Cardiac specialty hospitals receive a slightly lower percent of major/extreme MDC 5 cases from other local general hospitals than do their peer competitors (36.1% v. 40.5%).

Table 4-23
Transfers-in (receiver) to cardiac specialty and competitor hospitals, 2003

	Receiver hospital					
	Competitor		Specialty		Total	
Sender hospital	N	Major/ extreme	N	Major/ extreme	N	Major/ extreme
Acute General						
MDC5	2,584	40.5%	995	36.1%***	3,579	39.3
Other	2,327	54.8	100	48.0	2,427	54.5
Total	4,911	47.3	1,095	37.2***	6,006	45.4
Specialty						
MDC5	178	48.9***	23	52.2	201	49.3***
Other	248	56.9	6	50.0	254	56.7
Total	426	53.6***	29	51.7	455	53.4***
Total	**5,337**	**47.8**	**1,124**	**37.5*** **	**6,461**	**46.0**
MDC5	2,762	41.1	1,018	36.4***	3,780	39.8
Other	2,575	55.0	106	48.1	2,681	54.7

NOTE: ***p<.01 compared with general acute hospitals. Transfers-in to receiver hospital from any acute general or cardiac specialty hospital.

SOURCE: Medicare IPPS Claims, CY2003; WPY03R12.

Tables 4-24 and ***4-25*** report transfer statistics for orthopedic specialty hospitals and their local acute general competitors. Of the 6,699 Medicare MDC 8 discharges from specialty hospitals, only 112 were transferred out to another local hospital. Of these transfers, roughly 18 percent were major/extreme compared with over 35 percent transferred from a competitor hospital to another acute hospital in the same local area ($p < .01$). Of the 571 cases in MDC 8 transferred by competitor hospitals, only 27 were transferred to orthopedic specialty hospitals. The proportion of major/extreme cases sent to specialty hospitals (18.5%) was only half the severity proportion of those sent to other acute general facilities (36.0%; $p < .01$). Differences in severity among transfers-in to specialty and competitor orthopedic hospitals were similar to differences among those transferred out. For example, competitor orthopedic hospitals (Table 4-25) received 514 MDC 8 transfers-in to their facilities, and almost all were from other local general hospitals. The proportion of those transfers-in that were major/extreme was 51.7 percent, which is similar to the 46.7 percent of those transferred in from orthopedic specialty hospitals.

Table 4-24
Transfers-out (sender) to orthopedic specialty and competitor hospitals, 2003

	Receiver hospital					
	All acute general		Specialty		Total	
Sender hospital	N	Major/ extreme	N	Major/ extreme	N	Major/ extreme
Competitor						
MDC8	544	36.0%	27	18.5%***	571	35.2%
Other	8,041	39.3	533	27.8***	8,574	38.6
Total	8,585	39.1	560	27.4***	9,145	38.4
Specialty						
MDC8	109	18.4***	3	0.0	112	17.9***
Other	35	34.3	0	0.0	35	34.3
Total	144	22.3***	3	0.0	147	21.8***
Total	**8,729**	**38.8**	**563**	**27.2**	**9,292**	**38.1**
MDC8	653	33.1	30	16.7	683	32.4
Other	8,076	39.3	533	27.8	8,609	38.6

NOTE: ***p<.01 compared with competitor hospital. Transfers-out from a competitor or specialty hospital to any acute general or orthopedic specialty hospital.

SOURCE: Medicare IPPS Claims, CY2003; WPY03R14.

Table 4-25
Transfers-in (receiver) to orthopedic specialty and competitor hospitals, 2003

	Receiver hospital					
	Competitor		Specialty		Total	
Sender hospital	N	Major/ extreme	N	Major/ extreme	N	Major/ extreme
Acute General						
MDC8	499	51.7%	37	29.7%***	536	50.2
Other	8,576	45.8	19	10.5***	8,595	45.7
Total	9,075	46.1	56	23.2***	9,131	46.0
Specialty						
MDC8	15	46.7	5	20.0	20	40.0
Other	359	47.6	3	33.3	362	47.5
Total	374	47.6	8	25.0	382	47.1
Total	**9,449**	**46.2**	**64**	**23.4*** **	**9,513**	**46.0**
MDC8	514	51.5	42	28.6***	556	49.8
Other	8,935	45.9	22	13.6***	8,957	45.8

NOTE: ***p<.01 compared with competitor hospital. Transfers-in to receiver hospital from any general acute or orthopedic specialty hospital.

SOURCE: Medicare IPPS Claims, CY2003; WPY03R14(in).

4.7 Emergency Rooms & Physician Referrals

In this last section, we address the role of emergency rooms and how they mold specialty hospital referrals in general, and referrals by physician owners in particular.

4.7.1 Concerns over Specialty Emergency Rooms

Managers of full-service competitor hospitals in our site visits criticized the local specialty hospital for operating a minimal, or "token," emergency room. Discouraging emergency admissions was believed to be an important way in which physician owners avoided costly patients. We also learned during our site visits that while most states require some form of emergency room (ER) for licensure as an acute hospital (California appears to be an exception), ER regulations vary significantly. Several states we visited designated as many as four different levels. Orthopedic and surgery specialty hospitals, with one or two exceptions, operated minimalist emergency rooms that met the state requirement with only a single bed and on-call physician staffing. Except for the heart hospital in California,[26] the other three cardiac specialty

[26] The Fresno Heart Hospital did not have an ER but did have a "safety net" hospital partner several miles away with a large emergency department.

hospitals we visited operated 8-10 bed emergency rooms with a full time emergency care physician and staff.

Emergency rooms embody conflicting incentives for all hospitals that may explain differences by type of specialty hospital. On the one hand, ERs are an important source of inpatient and outpatient referrals. Cardiac specialty hospitals, because of the nature of the illnesses they treat, are more dependent than other specialty hospitals on acutely ill patients and depend on ER admissions. On the other hand, ERs attract a generally higher acuity patient when admitted. Orthopedic and general surgery procedures are more likely to be elective.[27] We also found that ownership and control of the local ambulance service can influence ER admissions. We heard anecdotally from one specialty hospital that ambulances routinely bypassed their emergency room because the service was owned by a competing general hospital. From local community hospital staff we also heard that ambulance drivers avoided the specialty hospital because they did not have "real ERs," and that they had to treat all of the difficult emergency cases.

To explore the how emergency room facilities might affect physician referral patterns and severity of illness between specialty and community hospitals, we used ER charges on the Medicare claim to indicate whether the patient had been admitted through the emergency room. We further stratified admissions by the ownership status of the physician. The analysis was limited to physicians that treated at least one patient at a local specialty hospital in one of the six markets we visited.

4.7.2 Emergency Room Admission Rates

A smaller percentage of Medicare patients were found to be admitted through the ER in all three specialty hospital groups (Table 4-26). As expected given the size of their ERs, cardiac specialty hospitals exhibited the highest percentage of ER admissions of the three specialty groups. The likelihood of an ER admission was inversely related to the physician's ownership share, but this is determined, in fair, part by the physician's attachment to the specialty hospital. Non-owners (including medical specialists) are far less likely to admit to the local cardiac specialty hospital which is usually operating a less comprehensive ER than a full-service hospital. The fact that the Fresno Heart Hospital is in the data set and does not operate an ER also lowers the ER shares for all three levels of ownership.

The low emergency room utilization at orthopedic and surgical specialty hospitals can be attributed to their focus on elective surgery and the minimal emergency room requirements under most state laws.[28]

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[27] At least one orthopedic specialty hospital operated a large, nearly full-service, ER and was losing money every year. Unlike other orthopedic specialty facilities, it had a much broader range of specialties among its physician owners and served as an alternative practice venue as much as a profit center.

[28] Physician's Hospital in Oklahoma City is a notable exception for orthopedic facilities in operating a sizable emergency room. It accounts for a significant portion of ER admissions in its group. Its ER orientation is explained by having several primary care physicians among its ownership group.

Table 4-26
Share of discharges[1] with emergency room usage by physician-owned status and specialty/competitor hospital, 2003

	Non-Owners				Small Owner				Big Owner			
	Competitor		Specialty		Competitor		Specialty		Competitor		Specialty	
	Discharges	% ER	Discharges	% ER	Discharges	% ER	Discharges	% ER	Discharges	% ER	Discharges	% ER
Cardiac	4449	55.8%	2462	50.8%***	4197	58.6%	4329	31.5%***	1312	54.0%	2040	11.3%***
Orthopedic	1627	55.0%	441	4.3%***	1212	32.1%	595	2.7%***	253	21.7%	350	13.1%
Surgical	494	10.7%	56	0.0%	706	61.8%	303	7.6%***	744	53.9%	394	5.6%***

NOTE: [1]Excludes physicians with no admissions to the specialty hospital.

***, **, * Difference in utilization % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims.

Little differences were found in major/extreme severity rates by emergency status for cardiac specialty versus competitor hospitals (Table 4-27).

We followed this basic analysis of utilization by looking at share of discharges that are major/extreme by physician-owner status, emergency room utilization, and specialty/competitor hospital for physicians that have some admissions to specialty hospitals. We found that the major/extreme shares for cardiac ER patients were generally higher at the specialty hospitals than at the competitor hospital ***(Table 4-23).*** The major/extreme shares of orthopedic ER patients with no emergency room utilization were much higher at the competitor hospitals than at the orthopedic specialty hospitals with all differences statistically significant. Differences between major/extreme shares for patients with emergency room utilization at competitor and specialty hospitals were statistically insignificant, suggesting that this may not be a significant factor in explaining population differences between specialty and competitor hospitals.

Table 4-27
Share of discharges that are major/extreme by physician-owner status, emergency room utilization, and specialty/competitor hospital for physicians that have some admissions to specialty hospitals, 2003

	No emergency room		Emergency room	
Physician-owner status	AGH	SPH	AGH	SPH
Cardiac				
Non-owner with admissions at SPH	24.7%	29.5%	29.2%	32.3%
Small Owner	24.1	26.4	29.0	30.1
Big Owner	22.2	17.1	18.5	34.8***
Orthopedic				
Non-owner with admissions at SPH	19.2	5.7***	29.7	31.6
Small Owner	17.4	9.2***	29.1	18.8
Big Owner	10.6	3.0**	36.4	39.1
Surgical				
Non-owner with admissions at SPH	11.4	0.0	17.0	-
Small Owner	31.2	10.0***	33.0	26.1
Big Owner	33.5	19.4***	39.2	0.0**

NOTE:

***, **, * Difference in major/extreme % statistically significant at, respectively, 1%, 5%, and 10% levels (two-tailed tests).

SOURCE: Medicare IPPS claims.

4.8 Conclusion

4.8.1 Physician Ownership & Likelihood of Self-Referrals

The empirical evidence supports the hypothesis that physician ownership has a positive effect in directing patients to specialty hospitals. Ownership incentives, however, do not exhibit a uniform effect on referral patterns. A large number of physicians tend to have small shares (less than 2 percent) and continue to admit primarily to other hospitals in the community. Large owners who, in our interviews, were more dedicated to their facility naturally saw more of their patients their own facility. This could be driven by self-referrals, but it could also be that they received more referrals because of their reputation in the community. In smaller communities, surgical specialists are in strong demand regardless of where they practice.

From case study interviews, it is clear that owners, and all physicians in general, are constrained in where they refer patients by several factors including (a) patient preferences, (b) managed care networks, (c) specialty hospital location, and (d) taking emergency room "call" in local competitor hospitals. Case study interviews also revealed ways in which local acute general competitors could secure their referral networks in ways similar to specialty hospitals. For example, many community hospitals have purchased primary care practices with the understanding that patients seen in those practices would be referred to the hospital when necessary. We also encountered an arrangement between the cardiologists and managers in a community hospital that provided financial incentives through a management contract to continue to see patients in the facility.

4.8.2 Severity of Referrals to Specialty and Competitor Hospitals

Our results on large sample of hospitals and for calendar year 2003 confirm the lower acuity levels in specialty hospitals, on average. Cardiac specialty hospitals treat major/extreme cases at about three-quarters the rate of their peer competitor hospitals; surgical hospitals at about half the rate; and orthopedic hospitals at only one-quarter the rate of their competitors. Lower patient severity levels are based, for the most part, on favorable selection within DRGs and to a lesser degree on their case-mix specialization.

Average acuity levels, however, mask considerable variation. The wide variation in patient acuity within cardiac, orthopedic, or surgical specialty hospitals implies that they are in no way a homogeneous group. Our case studies revealed considerable diversity in bedsize, financial strength, joint ownership arrangements, and even their ultimate mission. We also found wide variation in acuity levels among local competitors.

Correlating extent of ownership with the severity rates for referrals was limited by small numbers of specialty hospitals. If a higher personal stake in a specialty hospital encourages a physician owner to avoid sicker patients, the effect appears to be small. Non-owners, too, admitted less sick patients to the local specialty hospital. This suggests that specialization in certain DRGs and avoiding the cost of maintaining many ancillary services to treat the medically compromised patient, more than degree of ownership, determines the lower acuity of specialty hospitals.

Many factors underlie the triaging of sicker patients to other hospitals, ranging from "what is best for the patient" to "avoiding financial losses on certain cases." Physician ownership is only one factor that might contribute to the widespread specialization and favorable selection that occurs in many communities.

4.8.3 Severity of Transfers from Specialty Hospitals

Overall transfer rates are quite low in community and specialty hospitals (about 1 percent) which prevented us from studying any ownership effects in the six case study cities or among the small surgical specialty hospitals more generally. We did find that cardiac specialty hospitals were no more likely to transfer heart (MDC 5) patients than were other competitor hospitals, on average, which was their primary service line-of-business (82%). When they did, these patients were only slightly more likely to fall in the major/extreme category. Orthopedic specialty hospitals, by contrast, were 3 times more likely than another local hospital to transfer an MDC 8 orthopedic patient (although the rate was still less than 2-in-100). Yet, when they did transfer an orthopedic (MDC 8) patient, their acuity was only half that compared to other local hospital transfers. This may be attributable to the lower acuity of patients generally admitted to these facilities in the first place

The analysis also revealed considerable triaging of sicker patients via transfers in the local hospital industry as a whole. This, again, is likely due to the limited service capabilities of local community hospitals. It may also be affected by insurance coverage and other factors.

4.8.4 Patient Severity in the Emergency Room

The claims data reveal many fewer emergency room admissions in specialty hospitals. This is particularly the case for both orthopedic and surgical specialty hospitals that tend to operate limited ERs or no ER at all. Cardiac specialty hospitals operated much larger, fully equipped and staffed ER services, in general. The reason was that heart patients tend to arrive at the hospital more often in an emergency situation and, therefore, are a critical source of admissions. Where the cardiac specialty hospital had a limited ER, they had an arrangement with their local non-profit partner to take medically compromised heart patients.

Acuity is generally higher for patients admitted through the emergency room. This had the effect of lowering inpatient acuity in orthopedic and surgical specialty hospitals. When physician owners do admit patients through their own emergency room, their acuity tends to be similar to patients they see in the ER in other community hospitals. We found in our interviews that a significant number of specialty hospital owners "took emergency call" at local community hospitals. This was to the mutual benefit of both parties. Local acute general hospitals needed their specialized expertise to treat their ER patients. Many physician owners we interviewed also stated that they needed the referrals in competitor ERs in order to fill their practice caseload, financially.

We also found in our site visit interviews with managers of specialty and competitor hospitals that states grant hospitals great latitude in the size and staffing of ERs, partly in response to the limited service capabilities in some outlying and smaller urban hospitals. Operating a full-service, fully staffed, ER is a very expensive proposition. State licensing boards recognize that the scope of a hospital's ER needs to be scaled to the size and service mix of the

facility. After stabilization, patients in more limited ERs are transferred routinely to tertiary facilities.

SECTION 5
QUALITY OF CARE

5.1 Overview

An argument put forward by specialty hospitals is that by focusing on a limited range of diagnoses and procedures, they have the potential to increase the quality of care provided to patients. The reasoning is that greater efficiency and expertise comes with focus, practice, and repetition—a narrower focus can provide higher quality care. Specialization, however, may also negatively affect quality of care. Since specialty hospitals are typically small and their staff have experience with a narrower range of illnesses, the hospital may lack the equipment, personnel, or experience required to treat the complex, multi-organ problems that can present following surgery. Because many of these supports (for example, medical-intensive care) can be found in community acute-care hospitals, patients treated at specialty hospitals may require emergency transfers to other settings or else may experience serious complications resulting from the lack of resources or knowledge.

In this section we present our findings regarding the quality of care at specialty hospitals. Two primary questions are addressed:

- Do measurable differences in the quality of care exist between specialty and community hospitals?

- What factors might explain any observed differences in quality?

5.2 Definitions of Quality of Care

Our framework uses the dimensions of quality of care put forward by Avedis Donabedian nearly 40 years ago. Donabedian (1966; 1980) described quality as including three factors: structure, process (now often called "performance"), and outcomes.

First, **structural measures** of quality typically include measures of the capacity of the facility to deliver quality health care. For hospitals, this may include government certification and private accreditation; physical attributes, including safety; and policies and procedures. An example of the use of structural measurement in assessing hospitals involves the staffing and training of nurses. Second, in terms of clinical quality, **process measures** often focus on the diagnosis and management of disease, but may also include measures such as providing patient education. Technical aspects of care related to process include the timeliness and accuracy of interventions as well as complications, and mishaps during treatment. Third, **health outcomes** include risk-adjusted mortality, unintended effects of treatment (e.g., infection), and the relief of symptoms. Patient satisfaction measures address various aspects of patient experience in comparison to their expectations. While patient satisfaction is also considered in our analysis, this aspect of quality of care is discussed in Section 6.

After presenting our empirical analysis of patient outcomes, we will discuss a number of structure and process attributes of specialty hospitals that may contribute to quality of care differences from community hospitals, including

- Specialization of specialty hospitals.
- Nurse staffing ratios and expertise.
- Physical environment and patient amenities such as private rooms.
- Patient and family communication/education.
- Quality monitoring.

The remainder of this section will present quantitative and qualitative evidence on differences in the quality of care between specialty and competitive hospitals. We begin with a brief description of our claims data set and our outcomes indicators, followed by quantitative analysis of each indicator. The latter point of the Section is a synthesis of qualitative research based on our visits to hospitals in the six case study cities.

5.3 Medicare Claims Data

To uncover any measurable differences in the quality of care between specialty and community hospitals, we based our analysis of survival and outcomes on Medicare claims. Data used for the outcomes analyses come from Medicare Part A inpatient claims from January 2003 through January 2004.[29] We focused our analysis on patients admitted to cardiac, orthopedic, and surgical specialty hospitals and their community hospital competitors during 2003. January 2004 claims were used to examine 30-day mortality and readmissions for patients discharged during December 2003.

Outcomes for cardiac patients were limited to admissions for conditions covered by MDC 5, Circulatory Disorders, which account for 82 percent of Medicare fee-for-service discharges from cardiac specialty hospitals. Focusing on cardiac patients admitted to the heart hospitals and their community competitors avoids comparing a disparate number of cases from the community hospitals that are not treated in comparable numbers in specialty hospitals. Similarly, outcomes for patients in orthopedic specialty hospitals were limited to MDC 8, Musculoskeletal Disorders, which account for 83 percent of all Medicare Fee-for-Service discharges from these hospitals. Outcomes in surgical specialty hospitals were limited to MDCs 8, 12, and 13, that account for about 50 percent of all Medicare fee-for-service discharges from these facilities. For both specialty and community hospitals, only Medicare fee-for-service patients are included in the claims data set. Therefore, results are generalizable only to these patients; patients who are covered by a Medicare managed care contract also are not included in this analysis.

5.4 Outcomes Indicators and Severity Adjustments

We calculated the following measures of quality of care: [30]

- Mortality during hospitalization and within 30 days of discharge from the hospital.

[29] Section 3 provides a more detailed description of the database and the construction of the analytic files.

[30] The specialty hospitals we visited shared with us measures such as infection rates, mortality rates, and other post-operative complications but we did not have comparable indicators from competitor hospitals.

- Complications during hospitalization.
- Readmission within 30 days of discharge.
- Discharge disposition.

We used several approaches to account for patient severity and case mix. To adjust for patient severity, we used the severity score generated by the APR-DRG risk adjustment grouper, a methodology developed by 3M Corporation. The severity score classified each Medicare claim into one of four subclasses of mortality risk: (1) Minor, (2) Moderate, (3) Major, and (4) Extreme. We stratified results by grouping together patients with either minor or moderate severity (APR-DRG severity scores of 1 or 2) or major and extreme severity (APR-DRG severity score of 3 or 4).[31]

To further enhance the comparability of patients across settings, we divided cardiac patients (MDC 5) into major heart procedures, PTCA procedures, and other (primarily medical admissions); see Section 3 for procedure group definitions. Orthopedic patients were divided into major surgery, minor surgery, and medical orthopedic admissions. Surgical specialty patients were divided into major and minor surgery. Mortality, complications, readmissions, and discharge disposition measures were stratified by patient severity as well as by DRG procedure categories.

The next four sections present in-depth quantitative analyses of outcomes. Each section begins with a detailed description of how the outcome measures were constructed.

5.5 Differences in Quality of Care: Mortality

5.5.1 Methods

Mortality is a commonly used measure to evaluate health care quality and can be assessed with administrative claims data. We employed two techniques to examine mortality: (1) calculating overall mortality rates for each of the three types of specialty hospitals and their competitors, and (2) constructing the Agency for Healthcare Research and Quality (AHRQ)

[31] APR-DRGs are an enhanced extension of the basic DRG (diagnosis related group) concept developed by 3M's Clinical Research Group, the National Association of Children's Hospitals and Research Institutes (NACHRI), and several physician groups.

While DRGs focus on the Medicare population, APR-DRGs describe a complete cross-section of acute care patients and are specifically designed to adjust data for severity of illness (How sick is the patient?) and risk of mortality (How likely is it that the patient will die?). The fundamental principle of APR-DRGs is that the severity of illness and risk of mortality are both dependent on the patient's underlying condition. High severity of illness and risk of mortality are characterized by multiple serious diseases and the interactions between the disorders.

The 3M™ APR-DRG methodology is the most widely used severity-of-illness and risk-of-mortality adjustment tool available today. It has become the standard for adjusting large volumes of data to account for differences related to the individual's severity of illness or risk of mortality. As a result, the focus can be on the differences in clinical care, thus providing equitable comparisons of quality and cost of care. APR-DRGs are also recognized as the tool of choice by commissions, state agencies, and others who disseminate comparative performance data to regulators, payers, and the general public.

Inpatient Quality Indicators (IQIs) to examine mortality for major cardiac and orthopedic procedures.

Overall Mortality Rates. We calculated overall inpatient and 30–day mortality rates following discharge from the hospital. The discharge disposition listed on the claim identified persons who died during hospitalization. To determine 30-day mortality, we used the Medicare enrollment data file. Overall mortality rates were stratified by disease severity using the APR-DRG score (described above). In addition, we used DRGs to divide the heart, orthopedic, and surgical MDCs (5, 8, 12, and 13) into categories based on procedure survival risk. Since non-elective procedures for conditions such as a hip fracture[32] have higher mortality rates than elective procedures, such as hip replacement, grouping discharges by DRG further controls for case mix when evaluating outcomes. We conducted t-tests to evaluate the statistical significance in means between the rates for specialty hospitals and their competitors.

AHRQ Procedure-Specific Mortality Rates. AHRQ developed a variety of tools for evaluating quality of health care, including the AHRQ Quality Indicators (QIs). These indicators are estimated using hospital administrative data to highlight potential quality concerns, identify areas that need further study and investigation, and to track changes over time. We used the SAS modules developed by AHRQ to create risk adjusted, condition specific, mortality rates. The risk adjustment modules use age, sex, and the APR-DRG severity score to adjust these measures for the following surgical procedures and medical conditions:[33]

- Abdominal aortic aneurysm (AAA) repair
- Coronary artery bypass graft (CABG)
- Acute myocardial infarction (AMI)
- Congestive heart failure (CHF)
- Percutaneous transluminal coronary angioplasty (PTCA)
- Carotid endarterectomy (CDE).

The AHRQ IQI software generates observed, expected, and risk-adjusted mortality rates. We focus on the ratio between the observed and expected rates. For each of the surgical and medical conditions listed above, the observed rate is the actual number of deaths per thousand patients admitted for that condition while the expected rate is an adjusted rate that uses national weights of the probability of death for all patients in the risk pool. If the observed/expected ratio is more than one, it indicates that the hospital performed worse than expected given its case mix or, in the case of mortality, more deaths occurred than expected. In contrast, in cases where this

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[32] Hip fracture was identified using the following ICD-9 codes: 820.0 to 820.09, 820.1 to 820.19, 820.2 to 820.22, 820.3 to 820.32, 820.8 and 820.9.

[33] See the IQI Users Guide available on the AHRQ web site for a detailed discussion of the risk adjustment methodology used in the calculation of these indicators (http://www.ahrq.gov).

ratio is less than one, the hospital performed better than expected with fewer deaths than expected.[34]

5.5.2 Mortality Rates among Cardiac Patients (MDC 5).

The overall, unadjusted, inpatient and 30-day mortality rates (***Table 5-1***) are far lower in cardiac specialty versus competitor hospitals: inpatient (1.98 percent versus 3.46 percent), 30-day (3.81 percent versus 6.71 percent). APR-DRG case-mix severity, however, is also considerably lower in specialty (22 percent severe) compared with competitor hospitals (39 percent severe).

Nevertheless, a less complex case mix does not explain all of the difference in mortality rates. Overall inpatient and 30-day mortality rates indicate that the quality of care in specialty hospitals is good—even within severity and procedure group. For both moderate (APR-DRG severity 1 or 2) and severe patients (APR-DGR severity 3 or 4), the proportion of patients that died while hospitalized was significantly less for specialty hospitals than for community hospitals across all DRG groupings. A t-test on the difference between means indicates that these differences are significant at the $p < 0.001$ level. This trend holds true for inpatient plus 30-day mortality rates as well.

Table 5-1
Overall mortality rates stratified by patient severity and by DRG grouping (MDC 5): Cardiac specialty versus competitor hospitals

	Inpatient Mortality						Inpatient & 30 day Mortality					
	Specialty			Competitor			Specialty			Competitor		
Severity level	N. died	N	% died	N. died	N	% died	N. died	N	% died	N. died	N	% died
Moderate												
(APR-DRG severity 1 and 2)												
Major Heart	16	3,326	0.48*	63	8934	0.71	39	3,326	1.17*	147	8,934	1.65
PTCA, Etc.	19	8,046	0.24*	70	22,525	0.31	72	8,046	.90*	240	22,525	1.07
Other	39	6,690	0.58*	543	53,593	1.01	128	6,690	1.91*	1886	53,593	3.52
Severe (APR-DRG severity3 or 4)												
Major Heart	201	2,076	9.68*	935	7,810	11.97	279	2,076	13.44*	1245	7,810	15.94
PTCA, Etc.	27	1,125	2.40*	231	4,356	5.30	66	1,125	5.87*	408	4,356	9.37
Other	157	1,912	8.21*	2,244	20,848	10.76	299	1,912	15.64*	4,000	20,848	19.19
Overall	459	23,175	1.98*	4,086	118,066	3.46	883	23,175	3.81*	7,926	118,066	6.71

*p < 0.001 relative to competitor hospitals.

NOTE: Moderate severity includes APR-DRG severity category 1 or 2; Severe includes APR-DRG severity category 3 or 4.

SOURCE: 2003/4 Medicare IPPS claims.

The IQIs for the cardiac specialty hospitals also indicate that the overall quality of care is good compared with all cardiac patients nationally (see ***Table 5-2***). For each of the four procedure-specific mortality rates (AAA repair, CABG, PTCA, and carotid endarterectomy), the

[34] Additional information about the AHRQ IQIs can be found at http://www.qualityindicators.ahrq.gov/.

Table 5-2
Observed and expected mortality rates per 1,000 discharges: cardiac specialty versus competitor hospitals

	Specialty	Competitor
AAA repair		
Number of deaths	16	101
Population at risk	206	948
Observed rate	77.67	106.54
Expected rate	99.91	141.82
Observed/expected	***0.78***	***0.75***
CABG		
Number of deaths	152	484
Population at risk	4,036	10,922
Observed rate	37.66	44.31
Expected rate	47.87	51.50
Observed/expected	***0.79***	***0.86***
PTCA		
Number of deaths	93	469
Population at risk	8,925	24,706
Observed rate	10.42	18.98
Expected rate	14.70	19.71
Observed/expected	***0.71***	***0.96***
Carotid endarterectomy		
Number of deaths	4	19
Population at risk	142	315
Observed rate	28.17	60.32
Expected rate	49.05	49.31
Observed/expected	**0.57**	**1.22**
CHF		
Number of deaths	95	1,408
Population at risk	3,001	30,859
Observed rate	31.66	45.63
Expected rate	76.39	76.92
Observed/expected rate	***0.41***	***0.59***
AMI, excluding transfers		
Number of deaths	197	1,649
Population at risk	3,094	14,804
Observed rate	63.67	111.39
Expected Rate	91.78	128.51
Observed/expected rate	***0.69***	***0.87***

NOTE: Observed/Expected <1 indicates better than expected performance or fewer than expected deaths. Expected rate based on risk-adjusted AHRQ IQI methodology.

SOURCE; 2003 Medicare IPPS claims.

observed/expected ratios are less than 1.0, indicating that the specialty hospitals performed better than expected, nationally, given the hospital's case mix. Similarly, the observed/expected ratio for the two condition-specific mortality rates (CHF and AMI excluding transfers) are also well below 1.0. Overall, the competitor hospitals also performed well on the IQIs. Their observed/expected ratio was less than 1.0 for three of the four procedure-specific mortality rates and for both of the condition-specific mortality rates. Specialty hospitals performed somewhat better than competitor hospitals on five of six IQIs. Specialty hospital observed/expected mortality ratios are lower despite the fact that their expected rates are also consistently lower compared with their competitors. Lower expected mortality implies less severe cases. Specialty hospitals exhibited lower severity for AAA repairs, CABG, PTCA and AMI. This suggests that case selection is not producing their consistently lower mortality rates.

5.5.3 Mortality Rates among Orthopedic Patients (MDC 8)

The overall inpatient and inpatient plus 30-day mortality rates indicate that the quality of care in both specialty and community hospitals is good (see ***Table 5-3***).

Table 5-3
Mortality rates stratified by patient severity and DRG grouping (MDC 8): Orthopedic specialty versus competitor hospitals

	Inpatient Mortality						Inpatient + 30 day Mortality					
	Specialty			Competitor			Specialty			Competitor		
Severity level	# died	N	% died	# died	N	% died	# died	N	% died	# died	N	% died
Moderate												
Major Ortho	0	3,954	0.00*	124	40,192	0.31	5	3,954	.13*	660	40,192	1.64
Minor Ortho	0	1,614	0.00*	6	13,960	0.04	1	1,614	.06*	96	13,960	.69
Medical	0	79	0.00*	102	14,583	0.70	1	79	1.27*	620	14,583	4.25
Severe												
Major Ortho	2	346	0.58*	526	14,178	3.71	4	346	1.16*	1228	14,178	8.66
Minor Ortho	0	24	0.00*	28	829	3.38	0	24	.00*	50	829	6.03
Medical	0	1	0.00	315	4,484	7.03	0	1	.00	830	4,484	18.51
Overall	0	6,018	0.03*	1,101	88,226	1.25	10	6,018	0.17*	3,484	88,226	3.95

*p<.001 relative to competitor hospitals.

NOTE: Moderate severity includes APR-DRG severity category = 1 or 2; Severe includes APR-DRG severity category 3 or 4.

SOURCE: 2003/4 Medicare IPPS claims.

While small numbers are an issue (there were very few deaths reported at specialty hospitals), the data indicate that the specialty hospitals had a significantly lower proportion of deaths for both moderate and severe patients than community hospitals across most DRG groupings. A relatively small number of discharges (371) from specialty hospitals were in the severe category with only two deaths. Since there were no inpatient deaths due to hip replacement or hip fracture in the specialty hospital sample, we were unable to calculate IQIs for orthopedic specialty hospitals.

The findings suggest that, given their case mix, specialty hospitals perform quite well on mortality. Given that the measures are not calculated on a DRG specific basis, direct comparisons between specialty and competitor hospitals must be considered carefully. The significant differences in mortality rates could be due in part, to a difference in the DRGs among patients receiving services at competitor hospitals. This is evidenced by the high proportion of patients categorized as severe in competitor hospitals (22 percent) compared to specialty hospitals (6 percent). Hip fractures, which are non-elective procedures, tend to be more severe cases, and the proportion of hip fractures relative to all MDC 8 discharges in the community hospitals was significantly greater than in the specialty hospitals (17.4 percent and 0.7 percent, respectively). Nevertheless, within severity and major/minor orthopedic groups, specialty hospitals exhibited lower mortality rates.

5.5.4 Mortality Rates among Surgical Patients

For both moderate and severe patients, there were no inpatient deaths in any of the surgical specialty hospitals in our sample, and only one death in a "moderate" patient within 30 days after discharge (see ***Table 5-4***). While small numbers are an issue, the data seem to indicate that the specialty hospitals provide high-quality care to their surgical patients (analysis was limited to MDCs 8, 12, and 13). Competitor hospitals also had relatively few deaths; the proportion of deaths among moderate patients was less than 1 percent. This rate was much higher for severe patients. While a *t*-test of the difference between means suggests that the specialty hospitals are performing significantly better for patients with a *major* surgical procedure (results were not statistically significant for minor surgical procedures), several data limitations should be considered. First, competitor hospitals served a more severe case mix: 18 percent in competitor hospitals versus 8 percent in surgical specialty hospitals. In addition, the number of severe patients discharged from a specialty hospital was quite small, making the stability of these rates questionable. Two deaths in the next 38 severe major surgery discharges from specialty hospitals would make the observed 30-day mortality rate equivalent to that of competitors.

Table 5-4
Mortality rates stratified by patient severity and DRG grouping (MDC 8, 12, and 13), Surgical specialty versus competitor hospitals

	Inpatient Mortality						Inpatient + 30 day Mortality					
	Specialty			Competitor			Specialty			Competitor		
Severity level	N. died	N	% died	N. died	N	% died	N. died	N	% died	N. died	N	% died
Moderate												
Major Surg	0	191	0.00*	2	2,347	0.09	1	191	0.52*	22	2,347	0.94
Minor Surg	0	253	0.00	0	877	0.00	0	253	0.00*	1	877	0.11
Severe												
Major Surg	0	38	0.00*	18	694	2.59	0	38	0.00*	40	694	5.76
Minor Surg	0	1	0.00	1	8	12.50	0	1	0.00	3	8	37.50
Overall	0	483	0.00*	21	3,946	0.53	1	483	0.21*	66	3,946	1.67

*p < 0.001 relative to competitor hospitals.

NOTE: Moderate Severity includes APR-DRG severity 1 or 2; Severe includes APR-DRG severity 3 or 4.

SOURCE: 2003/4 Medicare IPPS claims.

5.6 Difference in Quality of Care: Complications During Hospitalization

5.6.1 Methods

The occurrence of adverse events and complications during hospitalization is another important aspect of health care quality that may not be fully reflected in mortality statistics. Using AHRQ's Patient Safety Indicators (PSI) software programs,[35] we constructed observed-to-expected rates for 16 patient safety indicators as shown is ***Exhibit 5-1***.

Exhibit 5-1
Sixteen AHRQ patient safety indicators used in quality-of-care analyses

Complications of anesthesia.	Postoperative hemorrhage or hematoma
Foreign body left during procedure	Postoperative physiologic and metabolic derangements
Iatrogenic pneumothorax	Postoperative respiratory failure
Decubitus ulcer	Postoperative pulmonary embolism or deep vein thrombosis
Failure to rescue	Postoperative sepsis
Death in low mortality DRGs	Postoperative wound dehiscence
Selected infections due to medical care	Accidental puncture or laceration
Postoperative hip fracture	Transfusion reaction

AHRQ's Patient Safety Indicators (PSIs) reflect inpatient quality of care by focusing on potentially avoidable complications and iatrogenic events. They are not intended to be definitive quality measures since many factors influence performance—some of which are independent of quality of care. However, high patient safety rates may indicate possible quality problems. Since no "right rates" have been established for most indicators, AHRQ suggests comparing rates among providers that are as similar as possible in case mix, patient socioeconomic status, and other demographics (i.e., "peer groups"). Because our study and comparison groups are heterogeneous in terms of severity, we constructed expected rates and observed/expected ratios to control for case-mix differences.

[35] Additional information about the AHRQ PSIs can be found at http://www.qualityindicators.ahrq.gov/

While the PSIs can be valuable tools for gauging quality in hospital settings, AHRQ cautions that performance on a single PSI does not reliably indicate true quality differences. The agency recommends using more than one indicator in combination to produce a more complete picture of overall quality of care. While groups of indicators have not been validated as sets, using them as such can be useful when exploring hospital quality. Therefore, while we report on the hospitals' performance on specific indicators, we draw general conclusions based on consistent set of findings across indicators.

Many of the complications captured by the PSIs are extremely rare. This limitation can be overcome by examining several years of data. However, given the time constraint for this analysis, we were only able to work with CY 2003 claims. Caution should be taken when interpreting the results for individual PSIs due to very small numerators. This limitation reinforces the argument for reporting the results using the whole set of PSIs rather than individual indicators. We conducted a binomial sign test of the likelihood that the observed pattern of PSIs as a group between specialty and competitor hospitals could have occurred by chance (Spent, 1993).

Another limitation when interpreting the results of the PSIs is that this analysis is restricted to inpatient data. Therefore, any infections/complications that appear after discharge will not be captured in the data unless they result in readmission (which we do analyze in Section 5.7). The software also excludes admissions that are the result of a transfer into the facility from another acute care hospital to avoid spuriously attributing a patient safety issue to the receiving hospital. The software also excludes discharges that were admitted to another acute care facility within 24 hours of discharge (as this could be considered patient "dumping").

5.6.2 Complication Rates in Cardiac Hospitals

The PSIs indicate that specialty hospitals overall are performing better than expected in avoiding in-hospital complications and adverse events (see Table 5-5). For 11 of the 14 PSIs calculated, the observed/expected ratios were less that one, indicating that the specialty hospitals performed better than expected, nationally, given the hospitals' case mix. Competitor hospitals in the sample had observed/expected ratios less than 1.0 for just 6 of the 14 PSIs, which suggests that they performed about average given their case mix. Specialty hospitals exhibited lower observed-to-expected ratios than their competitor hospitals in 13-of-14 indicators. Based on the binomial sign test, the likelihood of cardiac specialty hospitals being superior to their competitors in 13-of-14 PSIs simply by random chance is less than 1 percent.

There were three areas where both specialty and competitor hospitals performed worse than expected: iatrogenic pneumothorax, post-op physiologic and metabolic derangements, and accidental puncture or laceration. Both types of hospitals could focus their quality improvement efforts in these areas.

5.6.3 Complication Rates in Orthopedic Hospitals

In general, the PSIs indicate that the quality of care is good for patients discharged from orthopedic specialty hospitals (see ***Table 5-6***). Specialty hospitals had an observed/expected ratio of less than one for 12 of 14 PSIs. Competitor hospitals had more mixed results. For 6 of the 14 indicators, they had observed/expected ratio of less than one, suggesting that they performed about average with respect to complications.

Table 5-5
Observed and expected MDC 5 complication rates (per 1,000 admissions): Cardiac specialty versus competitor hospitals

	Hospital type	
	Specialty	Competitor
Complications of anesthesia		
Number of cases	1	2
Population at risk	19,677	59,639
Observed rate	0.05	0.03
Expected rate	0.46	0.44
Observed/Expected	***0.11***	***0.08***
Death in low mortality DRGs		
Number of Deaths	3	44
Population at risk	2,336	21,000
Observed rate	1.28	2.10
Expected rate	1.43	1.72
Observed/Expected	***0.90***	***1.22***
Decubitus ulcer		
Number of cases	60	1,037
Population at risk	8,258	57,040
Observed rate	7.27	18.18
Expected rate	11.27	19.97
Observed/Expected	***0.64***	***0.91***
Failure to rescue		
Number of cases	61	768
Population at risk	873	7,833
Observed rate	69.87	98.05
Expected rate	123.51	113.71
Observed/Expected	***0.57***	***0.86***
Foreign body left during procedure		
Number of cases	2	11
Population at risk	30,704	155,441
Observed rate	0.07	0.07
Expected rate	0.08	0.07
Observed/Expected	***0.79***	***0.99***
Iatrogenic pneumothorax		
Number of cases	36	246
Population at risk	24,605	136,056
Observed rate	1.46	1.81
Expected rate	0.80	0.76
Observed/Expected	***1.83***	***2.38***
Selected infections due to medical care		
Number of cases	39	539
Population at risk	28,562	137,988
Observed rate	1.37	3.91
Expected rate	2.42	2.94
Observed/Expected	***0.56***	***1.33***
Post-op hip fracture		
Number of cases	4	33
Population at risk	19,549	58,853
Observed rate	0.20	0.56
Expected rate	0.36	0.41
Observed/Expected	***0.57***	***1.37***

(continued)

Table 5-5 (continued)
Observed and expected MDC 5 complication rates (per 1,000 admissions): Cardiac specialty versus competitor hospitals

	Hospital type	
	Specialty	Competitor
Post-op hemorrhage or hematoma		
Number of cases	23	137
Population at risk	19,656	59,593
Observed rate	1.17	2.30
Expected rate	3.31	3.36
Observed/Expected	***0.35***	***0.68***
Post-op physiologic and metabolic derangements		
Number of cases	13	85
Population at risk	13,291	29,785
Observed rate	0.98	2.85
Expected rate	0.74	1.15
Observed/Expected	***1.32***	***2.49***
Post-op pulmonary embolism or DVT		
Number of cases	98	576
Population at risk	19,658	59,058
Observed rate	4.99	9.75
Expected rate	9.36	10.49
Observed/Expected	***0.53***	***0.93***
Post-op sepsis		
Number of cases	22	165
Population at risk	3,848	11,791
Observed rate	5.72	13.99
Expected rate	8.53	13.62
Observed/Expected	***0.67***	***1.03***
Post-op wound dehiscence		
Number of cases	0	10
Population at risk	446	2,289
Observed rate	0.00	4.37
Expected rate	3.14	2.96
Observed/Expected	***0.00***	***1.47***
Accidental puncture or laceration		
Number of cases	174	630
Population at risk	30,704	155,441
Observed rate	5.67	4.05
Expected rate	4.47	3.07
Observed/Expected	***1.27***	***1.32***

NOTE:

SOURCE: 2003 Medicare IPPS claims.

Table 5-6
Observed and expected MDC 8 complication rates (per 1,000 admissions): Orthopedic specialty and competitor hospitals

Patient Safety Indicator PSI)	Hospital type	
	Specialty	Competitor
Complications of anesthesia		
Number of cases	2	21
Population at risk	6,564	78,235
Observed rate	0.30	0.27
Expected rate	0.76	0.70
Observed/Expected rate	***0.40***	***0.38***
Death in low mortality DRGs		
Number of Deaths	0	49
Population at risk	1,483	13,830
Observed rate	0.00	3.54
Expected rate	0.94	2.27
Observed/Expected rate	***0.00***	***1.56***
Decubitus ulcer		
Number of cases	3	995
Population at risk	519	36,484
Observed rate	5.78	27.27
Expected rate	12.20	24.72
Observed/Expected rate	***0.47***	***1.10***
Failure to rescue		
Number of cases	1	171
Population at risk	56	2,487
Observed rate	17.86	68.76
Expected rate	61.69	94.76
Observed/Expected rate	***0.29***	***0.73***
Foreign body left during procedure		
Number of cases	0	10
Population at risk	6,701	100,635
Observed rate	0.00	0.10
Expected rate	0.12	0.09
Observed/Expected rate	***0.00***	***1.08***
Iatrogenic pneumothorax		
Number of cases	0	15
Population at risk	6,176	68,203
Observed rate	0.00	0.22
Expected rate	0.33	0.37
Observed/Expected rate	***0.00***	***0.59***
Selected infections due to medical care		
Number of cases	0	136
Population at risk	6,386	86,868
Observed rate	0.00	1.57
Expected rate	0.74	1.16
Observed/Expected rate	***0.00***	***1.35***
Post-op hemorrhage or hematoma		
Number of cases	3	48
Population at risk	6,564	78,234
Observed rate	0.46	0.61
Expected rate	0.27	0.39
Observed/Expected rate	***1.71***	***1.57***

(continued)

Table 5-6 (continued)
Observed and expected MDC 8 complication rates (per 1,000 admissions): Orthopedic specialty and competitor hospitals

Patient Safety Indicator PSI)	Hospital type	
	Specialty	Competitor
Post-op physiologic and metabolic derangements		
Number of cases	0	26
Population at risk	6,213	48,759
Observed rate	0.00	0.53
Expected rate	2.33	2.85
Observed/Expected rate	***0.00***	***0.19***
Post-op respiratory failure		
Number of cases	3	195
Population at risk	6,213	48,759
Observed rate	0.48	4.00
Expected rate	2.33	2.85
Observed/Expected rate	***0.21***	***1.40***
Post-op pulmonary embolism or DVT		
Number of cases	22	788
Population at risk	6,564	78,202
Observed rate	3.35	10.08
Expected rate	6.47	8.15
Observed/Expected rate	***0.52***	***1.24***
Post-op sepsis		
Number of cases	1	113
Population at risk	1,691	20,357
Observed rate	0.59	5.55
Expected rate	6.39	8.44
Observed/Expected	***0.09***	***0.66***
Accidental puncture or laceration		
Number of cases	90	666
Population at risk	6,701	100,635
Observed rate	13.43	6.62
Expected rate	8.13	3.75
Observed/Expected	***1.65***	***1.77***
Transfusion reaction		
Number of cases	0	0
Population at risk	6,701	100,635
Observed rate	0.00	0.00
Expected rate	0.00	0.00
Observed/Expected	***0***	***0***

NOTE:

SOURCE: 2003 Medicare IPPS claims.

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Orthopedic specialty hospitals exhibited lower observed-expected ratios for 11 of 14 complications. For the two PSIs where the specialty hospital had an observed/expected ratio greater than 1.0 (post-op hemorrhage or hematoma and accidental puncture or laceration), competitor hospitals performed similarly. One area in which specialty hospitals performed worse than their competitors was post-operative hemorrhage or hematoma. The specialty observed/expected rate was 1.71, compared with 1.57 for their competitors. This difference was not statistically significant. Orthopedic hospitals exhibited lower observed-to-expected PSI ratios than their competitor hospitals in 11-of-13 indicators (excluding transfusion reactions where both were zero). Based on the binomial sign test, the likelihood of orthopedic specialty hospitals being superior to their competitors in 11-of-13 PSIs simply by random chance is slightly over 2 percent.

5.6.4 Complication Rates in Surgical Hospitals

There were too few discharges from surgical specialty hospitals to calculate risk adjusted complication rates using the PSIs. However, even for the few patients at risk, there were no reportable complications (except for one case of a foreign body left during procedure). This suggests that the overall quality of care is good in surgical specialty hospitals. The populations at risk for the PSIs were also extremely small for the competitor hospitals, making results difficult to interpret. These results are not included in this analysis.

5.7 Difference in Quality of Care: Readmissions

5.7.1 Methods

At times, patients are readmitted shortly after an initial hospitalization (or "index" admission) for a complication stemming from the reason for admission. This may indicate a problem associated with the quality of care during the index admission. Patients who are readmitted may experience complications that are not accounted for in the PSI analysis. We calculated the number and rate of persons with a readmission to any hospital in the country within 30 days of being discharged (a commonly-used time frame for evaluating readmission rates). Readmission rates were stratified by patient severity level using APR-DRG and DRG procedure groupings to ensure that comparisons between the specialty and competitor hospitals reflect similar groups of patients.

While stratification may account for some of the differences in case mix, we do not have the data to account for differences in insurance, socioeconomic status, and other patient characteristics that may affect readmission rates. In addition, stratifying our sample in this way created categories with very low readmission rates, especially among specialty hospitals. Low frequencies may account for some of the seemingly large differences in specialty and competitor hospital numbers. Appendix 5-A.1 provides the ICD-9 codes and condition names that we used to determine the conditions to include as readmission.

5.7.2 Readmission Rates in Cardiac Hospitals

The proportion of patients in the moderate severity category readmitted after treatment at specialty hospitals ranged from 5 percent to nearly 9 percent depending on procedure intensity (DRG grouping) (see ***Table 5-7***). Competitor hospitals exhibited uniformly lower

readmission rates for patients with moderate severity. Similarly, a higher proportion of severe patients admitted to specialty hospitals were readmitted to any hospital compared to patients in competitor hospitals. “Severe” readmission rates for specialty hospitals were 14.6 percent to 16.6 percent while competitor rates were about 11 percent for all DRG groupings. All differences were statistically different.

Table 5-7
Readmission rates stratified by patient severity and DRG grouping (MDC 5): Cardiac specialty versus competitor hospitals

	Specialty			Competitor		
Severity level	# readmissions	N	% readmissions	# readmissions	N	% readmissions
Moderate						
Major Heart	278	3,326	8.36*	536	8,934	6.00
PTCA, Etc.	403	8,046	5.01**	1,080	22,525	4.79
Other	594	6,690	8.88*	3,902	53,596	7.28
Severe						
Major Heart	305	2,076	14.69*	860	7,812	11.01
PTCA, Etc.	169	1,125	15.02*	477	4,356	10.95
Other	317	1,912	16.58*	2,270	20,849	10.89
Overall	2,066	23,175	8.91*	9,125	118,072	7.73

NOTE: Moderate severity: APR-DRG severity levels 1 or 2; Severe severity: APR-DRG severity levels 3 or 4. Comparisons are limited to patients in MDC 5; excludes non-cardiac admissions.

*p < 0.001; ** p < 0.05 compared to competitor hospitals.

5.7.3 Readmission Rates in Orthopedic Hospitals

The proportion of patients in the moderate severity category readmitted after treatment at an orthopedic specialty hospital ranged from roughly 1.2 percent to 1.6 percent (see ***Table 5-8***). Readmission rates were higher for competitor hospitals, ranging from 1.8 percent to around 4.3 percent. These differences were statistically significant for all DRG groupings. The proportion of readmitted patients in the severe illness category was statistically lower for specialty versus competitor hospitals in all DRG groupings.

Table 5-8
Readmission rates stratified by patient severity and DRG grouping (MDC=8): Orthopedic specialty versus competitor hospitals

	Specialty Hospitals			Competitor Hospitals		
Severity level	N. readmissions	N	% readmissions	N. readmissions	N	% readmissions
Moderate						
Major ortho	63	3,954	1.59*	1,008	40,193	2.51
Minor ortho	22	1,614	1.36*	251	13,961	1.80
Medical	1	79	1.27*	638	14,584	4.37
Severe						
Major ortho	17	346	4.91**	843	14,179	5.95
Minor ortho	1	24	4.17**	54	829	6.51
Medical	0	1	0.00	317	4,484	7.07
Overall	104	6,018	1.73*	3,111	88,230	3.53

NOTE: Moderate severity: APR-DRG severity levels 1 or 2; Severe severity: APR-DRG severity levels 3 or 4.
*p < 0.01; ** p < 0.05 compared to competitor hospitals.

SOURCE: 2003 Medicare IPPS claims.

5.7.4 Readmission Rates in Surgical Hospitals

The number of readmissions from both surgical and competitor hospitals were too few to draw significant conclusions (especially among severely ill patients). Readmission rates for moderate patients with a major surgical procedure were lower for specialty hospitals while rates for minor surgical procedures were lower for competitor hospitals; however, none of these rates were statistically significant. We would need to repeat these analyses with multiple years of data to reach reliable conclusions regarding differences in the quality of care.

5.8 Difference in Quality of Care: Discharge Disposition

5.8.1 Methods

One of the claims by specialty hospitals is that more of their patients go home following an admission compared with community hospitals. The most desirable outcome is for patients to be discharged to their home with or without limited home health care. However, discharge disposition is dependent on a number of factors: where the patient was admitted from (e.g., nursing home or assisted living setting); the availability of a social support network comprehensive enough to provide necessary assistance at home; the underlying severity of the patient's condition and complications arising from inpatient care. From interviews, we believe that community hospitals are more likely to serve Medicare dual-eligibles, patients with no supplementary insurance, and those of lower socioeconomic status. Thus, we that larger proportion of patients discharged from community hospitals would go to a setting other than home. Since Medicare claims do not account for any of these factors, the net effect of the various factors on discharge disposition is ambiguous.

Using Medicare claims, we generated disposition frequencies for the following types of discharges:

- Home
- Home with Home Health
- Inpatient rehabilitation facility
- Skilled Nursing Facility (SNF)
- Other[36]

[36] The "other" category includes the following discharge dispositions: Intermediate Care Facility (ICF), another type of institution for inpatient care, left against medical advice, medical facility for hospice care, Medicare-approved swing bed within same facility, long-term care hospital, and referred to outpatient services at this or another institution.

We present results stratified by APR DRG level. Since we examined mortality separately above, as well as transfers in Section 4, transfers to another acute care hospital are excluded from this analysis.

5.8.2 Discharge Disposition in Cardiac Hospitals

In both the moderate and severe APR-DRG categories, specialty hospitals were more likely to discharge patients to home than were competitor hospitals ***(See Table 5-9.)*** Competitor hospitals were 1.5 to 3 times more likely than cardiac specialty hospitals to discharge to a rehab or SNF facility.

Table 5-9
Discharge disposition* by patient severity and DRG Grouping (MDC 5): Cardiac specialty and competitor hospitals

Disposition	Moderate Severity[1]				Severe[2]			
	Specialty		Competitor		Specialty		Competitor	
	N	%	N	%	N	%	N	%
Home								
Major Heart	3,080	79.2	7,186	68.2	1,319	59.0	3,700	43.0
PTCA, etc.	9,466	96.3	25,588	92.8	1,222	84.0	3,722	70.0
Other	8,277	92.0	53,764	79.1	1,831	75.8	13,927	55.1
Home health								
Major Heart	446	11.5	1,875	17.8	368	16.5	1,693	19.7
PTCA, etc.	168	1.7	868	3.2	96	6.6	595	11.2
Other	319	3.6	5,714	8.4	226	9.4	3,954	15.7
Inpatient rehab facility								
Major Heart	102	2.6	552	5.2	140	6.3	1,167	13.6
PTCA, etc.	22	0.2	189	0.7	15	1.0	232	4.4
Other	35	0.4	1,033	1.5	44	1.8	982	3.9
SNF								
Major Heart	152	3.9	622	5.9	222	9.9	1,219	14.2
PTCA, etc.	95	1.0	553	2.0	62	4.3	529	9.9
Other	176	2.0	4,673	6.9	147	6.1	4,108	16.3
Other[3]								
Major Heart	107	2.8	301	2.9	185	8.3	820	9.5
PTCA, etc.	84	0.9	378	1.4	59	4.1	243	4.6
Other	188	2.1	2,814	4.1	169	7.0	2,287	9.1

NOTES:

[1] Moderate severity includes APR-DRG severity levels 1 and 2

[2] Severe includes APR-DRG levels 3 and 4.

[3] Other category includes ICF, another type of inpatient facility, left against medical advice, hospice, swing bed, LTC hospital, referred to same or institution for outpatient services.

*Excludes inpatient deaths and transfers to short-term acute care hospitals.

SOURCE: 2003 Medicare IPPS claims

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5.8.3 Discharge Disposition in Orthopedic Hospitals

Over 50 percent of moderately severe patients and 29 percent of severe patients undergoing a major orthopedic procedure at a specialty hospital were discharged to home (see ***Table 5-10***). These rates are roughly double those for patients at competitor hospitals (moderate: 25 percent, severe: 13 percent). Similar differences are observed for patients with a minor orthopedic procedure. Competitor hospitals discharged a larger proportion of both moderate and severe patients to IRFs and SNFs than did specialty hospitals.

Table 5-10
Discharge disposition* by patient severity and DRG grouping (MDC=8): Orthopedic specialty and competitor hospitals

Disposition	Moderate Severity[1]				Severity[2]			
	Specialty		Competitor		Specialty		Competitor	
	N	%	N	%	N	%	N	%
Home								
Major Ortho	2,152	51.9	10,949	24.9	107	29.7	2,094	13.3
Minor Ortho	1,606	91.2	9,699	63.3	17	70.8	345	36.0
Medical	103	83.1	7,866	47.7	3	100.00	1,450	30.4
Home health								
Major Ortho	707	17.1	5,857	13.3	79	21.9	1,688	10.7
Minor Ortho	43	2.41	1,150	7.5	2	8.3	111	11.6
Medical	4	3.21	1,739	10.6	0	0	619	13.0
Inpatient rehab facility								
Major Ortho	965	23.3	15,005	34.2	130	36.1	5,185	33.0
Minor Ortho	84	4.8	2,167	14.1	4	16.7	183	19.1
Medical	9	7.3	1,794	10.9	0	0	525	11.0
SNF								
Major Ortho	132	3.2	8,304	18.99	21	5.9	4,467	28.4
Minor Ortho	12	0.7	1,641	10.79	0	0	182	19.0
Medical	4	3.2	3,583	21.79	0	0	1,393	29.2
Other								
Major Ortho	190	4.6	3780	8.69	23	6.4	2279	14.5
Minor Ortho	17	1.0	677	4.49	1	4.2	138	14.4
Medical	4	3.2	1500	9.19	0	0	780	16.4

NOTES:

[1] Moderate severity includes APR-DRG severity levels 1 and 2.

[2] Severe includes APR-DRG levels 3 and 4.

[3] Other category includes ICF, another type of inpatient facility, left against medical advice, hospice, swing bed, LTC hospital, referred to same or another institution for outpatient services.

*Excludes inpatient deaths and transfers to short-term acute care hospitals.

SOURCE: 2003 Medicare IPPS claims

5.8.4 Discharge Disposition for Surgical Hospitals (MDC 8, 12 and 13)

Fifty-two percent of patients in the moderate severity category who went to a specialty hospital for a major surgical procedure were discharged home compared with only 21 percent of similar patients who went to a competitor hospital. (see ***Table 5-11***). For severe patients, the

"discharged home" rates were 22 percent at specialty hospitals versus 13 percent at competitor hospitals. In addition, over 90 percent of moderately severe patients in both competitor and specialty hospitals with a minor surgical procedure were discharged home. A similar proportion of moderately severe patients with a major surgical procedure were discharged to IRFs. Rates in the other categories were too low to draw conclusions about discharge patterns.

5.9 Qualitative Findings

5.9.1 Methods

The previous sections quantified measurable differences in quality of care between specialty and competitor hospitals. Our findings show that specialty hospitals' quality of care is good relative to their competitors. In the rest of this section, we draw upon our qualitative interviews in six cities to better understand how specialty hospitals assure high quality and any problems they might have in caring for certain patients.

Because less is known about specialty hospitals than about local community hospitals, we focused our in-depth interviews on the specialty hospitals and how they operate, how they are organized, clinically, and how they deliver care. During our site visits we interviewed a

Table 5-11
Discharge disposition* by patient severity DRG grouping (MDC 8, 12, and 13), Surgical specialty and competitor hospitals

	Moderate Severity[1]				Severe Severity[2]			
	Specialty		Competitor		Specialty		Competitor	
	N	%	N	%	N	%	N	%
Home								
Major Surg[3]	100	51.8	537	21.4	8	21.6	93	13.0
Minor Surg	247	96.9	819	90.6	0	0.00	3	42.9
Home health								
Major Surg	7	3.6	279	11.1	0	0.00	64	8.99
Minor Surg	4	1.6	22	2.4	0	0.00	0	0.0
Inpatient rehab facility								
Major Surg	83	43.0	1242	49.5	28	75.7	365	50.89
Minor Surg	2	0.8	40	4.4	0	0.00	1	14.3
SNF								
Major Surg	1	0.5	254	10.1	0	0.00	133	18.5
Minor Surg	2	0.8	11	1.2	0	0.00	0	0.0
Other								
Major Surg	2	1.08	197	7.9	1	2.7	63	8.8
Minor Surg	0	0.00	12	1.3	1	100.00	3	42.9

NOTES:
[1] Moderate severity includes APR-DRG severity levels 1 and 2.
[2] Severe includes APR-DRG levels 3 and 4.
[3] Surgery with DRG relative weights >1.0
*Excludes inpatient deaths and transfers to short-term acute care hospitals.

SOURCE: 2003 Medicare IPPS claims

variety of staff members at specialty hospitals about issues related to health care quality, including staff nurses, nursing leadership, medical directors, surgeons, medical specialists, discharge planners, and quality and utilization directors (see Appendix 5 for interview protocols). We also conducted a limited number of focus groups of specialty and competitor hospital patients in these same site visit markets. (Patient satisfaction is discussed in greater depth in Section 6.) These interviews concentrated on structural and process characteristics that are known to influence outcomes of care.

5.9.2 Specialization and Quality

During our site visits, we were told repeatedly by a variety of specialty hospital staff that they believed their ability to focus on a limited number of procedures and diseases led to better care. The specialty hospitals managers maintained that they hired more experienced staff who had worked in other hospital settings, and were able to directly compare quality in specialty and other local hospitals. Nurses told us that in a specialty hospital they were not pulled away to different inpatient wards where they had to care for patients with a broad range of clinical problems. They felt that they could not respond as knowledgeably to patients and other clinical demands in larger, more diversified hospitals because of the breadth of subject matter and expertise required. They greatly valued the opportunity to focus on their own area of specialization. Nurses found specialization resulted in a less stressful work environment and, as a result, were able to provide better quality of care. Physicians generally believed that this focus on a limited set of diseases/procedures improved the ability of nurses and other staff to offer the best care in their markets.

According to specialty hospital staff, specialization led to closer interactions and improved communication between physicians and support staff. We were told by staff that specialty hospital administration was more accessible and responsive to quality of care issues raised by the staff. Many of the clinical directors at specialty hospitals made frequent rounds, had an ”open door” policy, and in one cardiac hospital, the clinical director, a former cardiac nurse, wore a nurse’s uniform and “pitched in” as needed. Greater management responsiveness was attributed in large part to specialization and smaller size, as well as to the closer attention paid to patients and staff physicians in the specialty hospital. Particularly valued by the nursing staff was the sense that the physicians trusted their judgments and opinions because of their specialized expertise. Because specialty hospitals are smaller with fewer layers of management, staff claimed that they would respond to physicians and patients more quickly without the procedural bureaucracy of larger hospitals.

In many of the specialty hospitals we visited we were also told by nurses that, because of specialization, there “seemed to be a protocol for everything.” For instance, specialty hospital physicians generally agreed upon a common set of orders that provided nurses with consistent instructions for dealing with problems that emerged regardless of the admitting physician. In some settings these decisions were incorporated in the computer software, providing nurses with guidelines based on physician consensus. In contrast, nurses described situations in community hospitals where they had worked where each physician had his or her own set of preferred orders. Inconsistent orders required that nurses either contact the physician or review physician-specific instructions prior to initiating an intervention. They felt that the specialty hospital approach improved quality by identifying common processes. That

physicians in a specialty hospital would not treat the facility as their own personal "workshop" was unexpected. It was clear that their ownership position obligated physicians to collaborate more as a team than in other hospital settings.

A number of the specialty hospitals did concede that, albeit infrequently, they have to transfer some critically ill patients to local community hospitals, usually as a result of unanticipated complications and sometimes limited clinical resources. Most argued that the only transfers that regularly occurred were patients needing a post-acute rehabilitation hospital or a skilled nursing facility. In contrast, competing community hospital clinicians tended to describe these emergency transfers as "train wrecks" occurring with some frequency. They also identified these occurrences as evidence of poor quality of care in the specialty hospitals.

Beneficiaries in our focus groups thought that nurses were more attentive and knowledgeable in specialty hospitals. For patients who had been hospitalized elsewhere for a serious condition, they compared their experience in a specialty hospital to being in an intensive care unit at a community hospital.

5.9.3 Nurse Staffing and Quality

During site visits, the lower patient-to-staff ratio was often cited as a reason for the better quality of care in specialty hospitals. This lower ratio, generally reported to us as no more than 3 or 4 patients to 1 nurse, was believed to enable nurses to spend more time with patients and their families. We were told that in competitor hospitals it was not unusual for one nurse to monitor 10 to 12 patients. In some specialty hospitals we visited, a single nurse followed a patient throughout his or her entire stay, which was believed to facilitate better communication between the nurse, doctor, and patient. Specialty hospital nurses believed they had more time to spend educating patients on their procedures and helping family members and the patient prepare for post-discharge care. It was common for the specialty hospitals to place an emphasis on an all-RN staff with the use of patient care assistants, usually one assistant for one or two RNs. Nursing assistants were viewed as support for the nurses rather than as the front line of patient care. The focused RN-staff was believed to enabled cross training that allowed the nurses to be "fluid," meaning they were certified in critical care and telemetry and could move as needed from one cardiac unit to another. Many specialty hospital physicians believed that the opening of a specialty hospital "raised the bar" in the community in terms of health care.

As reported by the specialty hospitals, the turnover rate among nurses (and all other staff) was remarkably low. In some cases, specialty hospitals reported a 98 percent retention rate, with current RN vacancy at below 1 percent. None of them reported any problems in recruiting and retaining nurses, which is highly unusual in the current era of nurse shortages. Stability in the nursing staff was recognized by the physicians as a major contributor to the facility's high quality of care. The low turnover rate meant that they did not use part–time nurses; rather, they could rely on a permanent staff that knew the hospital and its procedures. It was true, however, that some of the newer cardiac and orthopedic hospitals had low occupancy rates that required them to use per diem nurses from the local community.

Overall, Medicare beneficiaries in our focus groups were "effusive" about the nursing care they had received in the specialty hospitals. Several beneficiaries remembered their nurses by name. Most beneficiaries at specialty hospitals reported that the nurses were extremely attentive, often checking on them every 30 minutes or so throughout the day. According to one beneficiary, "They [the nurses] were always there; in fact, sometimes they were there without asking." Others reported that they "never had to ring for a nurse" because they "just came by frequently to check" on them during their hospitalization. When asked if they had felt the effects of the nursing shortage during their hospitalization, almost all beneficiaries said no, remarking that the specialty hospitals were "probably better staffed than any other hospital" in which they had been admitted. Frequently, beneficiaries appreciated that RNs, rather than nurse assistants or techs, provided most of the care they received while hospitalized. According to one beneficiary, "you didn't always get an aide or something like that [in another hospital]; your nurse was available."

Beneficiaries in the competitor hospital focus groups were also generally complimentary about the nursing care they received, but did not discuss the topic at length or with the same level of enthusiasm.

5.9.4 Physician and Technical Support and Quality

In some cases, limitations of the smaller specialty hospitals did lead to potential quality issues. For example, some specialty hospitals lacked a pharmacist on the premises at night. If a medication was changed at night (after 8 PM and before 6 AM) nurses had access to the pharmacy in some cases and dispensed the medication. These hospitals conceded that these orders should be checked by the pharmacist, but it was not possible in some of these small facilities. Other specialty hospitals did have pharmacists on call at night.

Another issue that arose was physician coverage at night. The cardiac hospitals we visited generally had an emergency room, so that a physician was on the premises 24 hours a day. However, in some of the orthopedic and surgical hospitals, a physician was available on call from home during nights and evenings. In an emergency, such as a sudden massive bleeding at the surgical site or a cardiac or pulmonary arrest, the nurses initiated cardiopulmonary resuscitation and called 911 for emergency paramedics as well as contacting the physician on call.

Another potential quality issue is the lack of specialists in attendance in some specialty hospitals. To address this problem, hospitals had a list of specialists to call to consult on a particular patient. In addition, orthopedic and surgical specialty hospitals contracted with physician hospitalist groups who were available in the event of an emergency or to monitor the medical problems of the surgical patients. For at least 12 hours of the day at the specialty cardiac hospitals, there were always a number of both invasive and non-invasive cardiologists in the building. One heart hospital actually had the physician offices located in a wing of the hospital. In addition, the operating rooms and cardiac catheterization labs were in very close proximity to the patient care units and emergency department (ED).

5.9.5 Patient Amenities and Quality

In the site visits, we found that physicians in specialty hospitals believed that the amenities offered to patients improved quality of care. They particularly cited the use of private rooms, which they argued helped patients rest and recover better. Reduced infection rates were also a logical outcome of single-room accommodations in specialty hospitals. Also, physicians and staff claimed that comfortable surroundings, space for families, and better food all played a role in better quality of care.

In the focus groups we conducted, beneficiaries receiving care at a specialty hospitals had very positive experiences and expressed appreciation for the "extras" provided. Beneficiaries commented on the private rooms, more space, lower noise levels, and treatment of family members, including pleasant waiting areas. Several beneficiaries, without prompting, raised the topic of how the environment seemed to make recovery easier. Beneficiaries treated at a specialty hospital became aware that a higher level of service was available. In contrast, many beneficiaries discharged from competitor hospitals expected the inconvenience associated with a shared room, a higher level of noise, limited family member accommodations, less plush waiting areas, and occasionally nettlesome teaching rounds and residents and interns. This was generally considered part of the hospital experience.

5.9.6 Patient Communication, Education and Quality

Patient-focused models found in the specialty hospitals, staff argued, allowed more time for nurses to spend with patients. Since the majority of admissions to specialty hospitals are elective, relationships with staff begin even before the patient is admitted. The same nurse who will care for the patient during his/her hospitalization may also do their pre-operative teaching and orientation. In specialty hospitals, the nurses believed they were able to concentrate in on the patient's educational needs and to impart information important to a successful recovery.

Beneficiaries in our focus groups who received services at specialty hospitals felt the nurses were highly knowledgeable about the specialty area, thereby engendering confidence in the care they received. For example, one beneficiary commented: "I felt like the nurses were trained in that specific area and therefore we didn't have to do as much explaining to them about what we felt was going on with our bodies." The confidence the nurses showed, and knowledge they had, helped to relieve many of the fears that the patient had before surgery.

5.9.7 Quality Monitoring and Quality

Specialty hospitals often cited, and gave us, internal reports showing mortality and morbidity rates, lengths of stay, and discharges to home that they believed were either "best in the area" or compared very favorably with national norms. Indeed, physicians often cited better patient outcomes as a motivation for getting involved with a specialty hospital and the reason for admitting patients to the facility. A number of the specialty hospitals we visited were initially formed because physicians were dissatisfied with outcomes in the local community hospitals.

Not all specialty hospitals we visited were JCAHO accredited or participated in mandated quality improvement and patient safety requirements. This is sometimes due to the short time they have been open. Most are conducting patient safety projects to meet JCAHO requirements, including interventions to prevent patient falls using bed sensors, verbal orders, use of acronyms, and use of restraints. Specific quality monitoring indicators varied by the specialty hospital's clinical focus. For example, the specialty heart hospitals were able to show us their data on the 10 quality indicators collected by the Centers for Medicare and Medicaid Services. All the specialty hospitals conducted some form of a patient satisfaction surveys (see Section 6). Problems or negative comments were quickly addressed. We found similar types of quality monitoring efforts at competing community hospitals.

Specialty hospital staff reported physicians being very involved with quality monitoring and improvement. A number of specialty hospitals described a quality monitoring process whereby support staff could report quality issues that were then peer reviewed. Cases that needed more attention were discussed with the physician on the quality committee, then brought to a clinical review committee for further discussion and action. In some, cardiac specialty hospitals, significant investment had been made in electronic medical records. Electronic physician order entry was also found in most of the specialty heart hospitals, in order to be consistent with best practices.

5.10 Conclusions

Overall, specialty hospitals were found to provide a high level of quality of care. In terms of *outcomes*, mortality and complication rates, as well as discharge disposition, all support the claim that patients treated at specialty hospitals experience as good or better quality of care as in competitor hospitals. The one area of concern is the higher readmission rates in specialty hospitals; a topic worthy of more in-depth analysis.

These findings, however, do not support the conclusion that care is necessarily poorer at community hospitals. More rigorous analysis, using more years of data and a better understanding of the clinical differences between patients treated at both types of hospitals, is recommended.

From the site visits and focus groups, we found that *structural* measures of quality, such as staff competency and training, equipment and personnel amenities, and the availability of electronic physician order entry, all suggest a high quality of care in specialty hospitals. In addition, *process* of care measures, such as complication rates, also suggest good performance on the part of specialty hospitals.

A downside of specialization, however, is a more limited ability to address co-morbid illnesses in very compromised patients. From both quantitative and qualitative research, it is clear that specialty hospitals avoid such patients when possible. Whether this implies "poor quality" is controversial and should be addressed across the entire spectrum of community hospitals that vary considerably in patient severity.

SECTION 6
PATIENT SATISFACTION AND EXPERIENCE WITH HOSPITAL CARE

6.1 Overview

An important aspect of quality of care is patients' perspectives about the care they receive during their hospital stays. Section 507 of the MMA acknowledges the importance of patient satisfaction by requiring a comparison of the quality of and satisfaction with care in physician-owned specialty hospitals and in local community hospitals. Chapter 5 summarizes our findings comparing quality of care. While patient satisfaction can be viewed as an aspect of quality of care, the MMA legislation clearly distinguished this issue from clinical quality. Therefore, this chapter focuses on our findings on how patients in both specialty and community hospitals view the care they receive.

6.2 Methods

To evaluate patient satisfaction and experience with care, we relied on several sources of data: site visit interviews; a review of patient satisfaction surveys from specialty hospitals, (gathered as part of the site visits); and focus groups with Medicare beneficiaries who were treated for similar conditions at either a specialty hospital or an acute care general hospital in 2004.

6.2.1 Site Visit Methods

To conduct the site visits in the six market areas, RTI staff worked with the CMS Project Officer and representatives of the specialty hospital associations, the AHA, and the Federation of American Hospitals in contacting and gaining participation of the specialty and competitor hospitals. All specialty hospitals were visited in five of the six cities. In Oklahoma City, four of six specialty hospitals were visited, resulting in a total of 11 specialty hospital case studies. In addition, interviews were conducted in 11 competing hospitals in the same cities. These hospitals were selected either on whether they performed open heart surgery or were the major acute general facilities in the market.

Two- to four-person teams visited hospitals in each city for two to three days. The team spent full days in each of the four specialty cardiac hospitals and half days or longer in each of the other seven specialty hospitals. Two to four hours were also spent by the team in each competitor hospital. *The focus of the site visits was on the specialty rather than competitor hospitals.* This was done because the purpose of the site visits was largely to gather contextual and explanatory information to help us interpret the empirical analyses of the specialty hospitals. *We wanted to focus our limited resources on understanding how and why specialty hospitals in these markets operate.*

To discuss how patients experienced care in specialty hospitals, and to gather information on levels of patient satisfaction, informal discussion guides were used in interviews with key specialty hospital personnel: CEOs, Medical Directors, V.P.s of Clinical Services, physician non-owners, Directors of Nursing, Emergency Department, Discharge Planning, Quality Assurance, and Catheter Lab, as well as ICU and floor nursing staff. In these discussions with specialty-

hospital staff, we probed for any feedback the hospital received on patient satisfaction and overall experiences in the hospital. During our site visits to six communities, we also obtained reports regarding satisfaction survey results and use of data by specialty hospitals. In our more limited discussions with community hospitals in each of the site markets we visited, we also asked CEOs, Medical Directors, and other staff about how patients viewed the community hospital, and ways in which patient feedback was measured and monitored. Discussion protocols can be found in Appendix 4.

Information we gathered during these site visits provides important contextual background for understanding how specialty hospitals operate and what makes them different from community hospitals. However, there are several limitations to our findings. First, we could only visit a limited number of specialty hospital markets (given the time and resources available). While we believe the markets and hospitals we chose represent a reasonable cross-section of the specialty hospitals currently operating, our findings cannot be generalized to all markets. Second, again because of resource constraints, our site visits clearly focused on specialty hospitals rather than community hospitals. While we did visit the community hospitals in each of the six markets, *we spent much less time speaking with the community hospitals and therefore do not seek to fully describe their specific operations.* Rather, our focus was on describing specialty hospitals in detail, paying particular attention to policy issues identified in the MMA legislation. Finally, in site visits, we relied on self-reported information. Site visits, by their nature, present the perspectives of the interviewees. Therefore, the results we present from the visits represent what we were told by specialty and community hospital staff—not necessarily objective facts. For this reason, we have considered key issues such as patient satisfaction from a number of different sources, not simply the views of hospital staff.

6.2.2 Focus Group Methods

We conducted eight focus groups with Medicare beneficiaries. The focus groups enabled us to hear directly from patients about their experiences and observations. While focus group results are not intended to be generalizable to the underlying population of Medicare beneficiaries receiving care at either physician-owned specialty hospitals or community hospitals, they do provide insights into the patient's perspective. We did explore the feasibility of conducting patient surveys to measure satisfaction and experience with care. However, because time did not allow us to obtain OMB approval and field a survey, and the H-CAHPS survey under development by CMS/AHRQ was not yet approved by OMB for use, we decided to gather information through the use of focus groups with Medicare beneficiaries who received care at both specialty and community acute care hospitals.

Three markets from the site visits (Oklahoma City, OK, Fresno, CA, and Dayton, OH) were selected for focus groups with the intent of varying geographic location or market, specialty hospital ownership type (national firm or chain), and specialty hospital type (cardiac, orthopedic, surgical). ***Table 6-1*** lists the specifics of each focus group. The focus group participants (n=76) were all Medicare beneficiaries who were discharged from a specialty or local community hospital between January and June 2004. Groups were divided by type of hospital. Three focus groups were patients hospitalized in a cardiac specialty hospital (n=30), two were patients hospitalized in an orthopedic specialty hospital (n=17), and three were patients hospitalized in local community hospitals for a similar cardiac or orthopedic procedure (n=29).

Table 6-1
Medicare beneficiary focus groups: type of hospital and number of participants

Site	Hospital(s)	Type of Procedure	No. of Participants
Oklahoma City, OK			**27**
Cardiac Specialty Hospital	Oklahoma Heart Hospital	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5 Non-MDC 5	2 2 4 2
Orthopedic Specialty Hospitals	Center for Orthopedic & Multi-Specialty Surgery, Oklahoma Spine Hospital, Northwest Surgery Center	Major Orthopedic (MDC 8) Minor Orthopedic (MDC 8) Medical/Non-Medical MDC 8	4 2 1
Local Community Hospitals	Deaconess Hospital, OU Medical Center, Integris Baptist Medical Center, Mercy Health Center, Norman Regional Hospital	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5 Major Orthopedic (MDC 8) Minor Orthopedic (MDC 8) Medical MDC 8	1 1 2 2 2 2
Dayton, OH			**21**
Cardiac Specialty Hospital	Dayton Heart Hospital	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5 Non-MDC 5	1 4 4 2
Local Community Hospitals	Miami Valley Hospital, Good Samaritan Hospital, Kettering Medical Center	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5	4 4 2
Fresno, CA			**28**
Cardiac Specialty Hospital	Fresno Heart Hospital	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5 Non-MDC 5	4 1 2 2
Orthopedic Specialty Hospital	Fresno Surgery Center	Major Orthopedic (MDC 8) Minor Orthopedic (MDC 8) Medical/Non-Medical MDC 8	5 2 3
Local Community Hospitals	Saint Agnes Medical Center, Fresno Community Medical Center	Major Cardiac (MDC 5) PTCA, etc. Other MDC 5	3 4 2
Total Number of Participants			**76**

Within each focus group, participants were also stratified by type of procedure to ensure that patients undergoing both major and minor procedures were adequately represented. Participants were stratified into 7 procedure categories: Major Cardiac, MDC 5 (n=15); PTCA, etc. (n=16); Other MDC 5 (n=16); Non-MDC 5 (n=6); Major Orthopedic, MDC 8 (n=11); Minor Orthopedic (n=6); and Medical/Non-Medical MDC 8 (n=6). Most groups included equal numbers of men and women and at least one beneficiary from a minority group (e.g., Hispanic, African-American, or Native-American).

A protocol was developed to focus the discussion on topics such as choice regarding hospital, physician ownership of the hospital, aspects of the hospital experience that patients found important, and willingness to recommend the hospital to others who needed a similar procedure. Many protocol domains were modeled after the HCAHPS survey, a patient experience survey funded by CMS/AHRQ. Questions were also restructured to be conducive to a

more open-ended, group discussion. Each focus group took approximately one and one half hours. The focus group moderator's guide can be found in Appendix 6.

As with site visits, focus groups have methodological limitations. Most saliently, they gather the perspective of a limited number of beneficiaries—far too small to analyze using tests for statistical significance. Instead, focus group findings are intended to provide personal insight into the perspective of beneficiaries who received care in specialty and community hospitals.

6.3 Measuring Patient Satisfaction and Experience

To conceptualize domains of patient satisfaction and experience with care we used the Hospital CAHPS (HCAHPS) initiative, an AHRQ/CMS effort to "uniformly measure and publicly report patients' perspectives on their inpatient care" (HCAHPS Fact Sheet, 2004). The intent of the HCAHPS is to provide a national standard for collecting patient information that will enable valid comparisons to be made across all hospitals. Its domains of interest include[37]:

- Hospital environment
- Clinical care
  - Care from nurses and doctors
  - Experiences at the hospital
- Overall ratings

The following sections summarize the overall findings from our site visits and focus groups and discuss the results in detail. The results focus on areas where there were *differences* in beneficiary experiences in specialty hospitals versus community hospitals. This section on patient perspectives is organized by the domains discussed above: hospital environment, clinical care, and overall ratings. Within each domain, we discuss findings from both the site visits and focus groups. Several discussion topics from the focus groups are not highlighted, though, because beneficiary responses did not differ between hospital settings. For example, several questions in the protocol focused on the patient's experience with the care provided by his or her doctor. There was general consensus among all participants that they were satisfied with the interactions with their doctor, regardless of care setting.

6.3.1 Patient Perspectives on the Hospital Environment

The environment in the specialty hospital makes recovery "easier." Some of the specialty hospitals we visited resembled luxury hotels more than a typical hospital. Lobby entrances and common areas tended to be decorated based on local themes. Muted colors, comfortable seating, soft lighting, and quality artwork were present. These types of amenities were not found at competing community hospitals. Upscale food was also a common theme in many specialty hospitals. Emphasis was placed on more appealing food as well as the ability of

[37] HCAHPS instrument used is dated October 18, 2004. Source www.ahrq.gov

the patient to direct when and what they chose to eat (within dietary restrictions). Some of the specialty hospitals had "gourmet" chefs supervise their meals service. Others used outside vendors. Care was generally taken to present meals in a more appealing way, using china and linens rather than institutional packaging. It was also typical for specialty hospitals to offer additional meals to family members.

In the focus groups we conducted, beneficiaries receiving care at a specialty hospital had very positive experiences with the hospital environment and expressed appreciation for all the "extras" provided. Beneficiaries commented on the private rooms, the space, lower noise level (i.e., quiet vs. noisy), and treatment of family members, including pleasant waiting areas. Beneficiaries treated at a specialty hospital became aware that a higher level of service was available. In contrast, many beneficiaries who went to a community hospital expected the inconvenience associated with a shared room, a certain level of noise, fewer ways to accommodate family, including less plush waiting areas, and sometimes teaching rounds and residents and interns. They also reported more delays after being admitted to the hospital when being transferred for tests, etc. This was generally considered part of the hospital experience.

In all but one specialty hospital focus group, several beneficiaries raised the topic, without prompting, of how the environment seemed to make recovery easier. They discussed how a clean, quiet, efficient, well-organized environment contributed to the recovery process:

> *"If you have a heart condition, it's extremely anxiety producing. If you are in a setting where there's a lot of ruckus or you are concerned about whether you are going to get the kind of attention you need or if there's just generally a sense of disorganization or noise…it just adds to that anxiety level…(Name) Heart Hospital does generate that kind of environment."*
>
> *"I think you need the emotional sense…if you are ill, whatever the problem is and you see something that's dirty or feel like you are not getting care, emotionally that affects you. And I think emotionally having those things are as important as the actual health care itself."*

Several beneficiaries also remarked that being in a place that was *"more like a hotel room than a sterile hospital"* created a more relaxed environment that "makes you have a little better attitude. It keeps you mentally upbeat." Beneficiaries discussed how the specialty hospitals had "the whole package," meaning not only was the medical care excellent and the nursing staff attentive and knowledgeable; but the environment was quiet, clean, and efficient, which significantly increased the overall quality of care. There was no comparable discussion that emerged during the focus groups with patients from community hospitals.

Specialty hospitals are quieter. Specialty hospitals included in our site visits made conscious attempts to cultivate a more "restful" environment. Overhead pages and announcements, typical in community hospitals, were replaced by soft instrumental music—or silence. Some of the facilities had a low census so that it was difficult to say how quiet or noisy the unit would be if it were fully occupied; however, even the specialty hospitals that had a higher census were noticeably quiet. Noise and "bustle" on patient wards was at a minimum and nursing staff carried pagers to be responsive and avoid overhead paging.

Beneficiaries in the focus groups commented at length about the quiet environment at the specialty hospital; everyone agreed that the hospital was very quiet and restful. According to one beneficiary *"there was no yakking in the hallways at all…there was no real noise."* One patient noted that the "nurses and doctors all had pagers" so the PA system wasn't necessary. Another beneficiary felt that the size of the hospital made the environment unique:

> *"because the staff needed to handle it is smaller…They are in contact with everybody without having to have phones or PA systems."*

Many beneficiaries compared their experience with the specialty hospital to their last experience in a community hospital and remarked that the specialty hospital was "very unusual" and *"a lot quieter than other hospitals I've been in."*

In contrast, beneficiaries in our focus groups from community hospitals reported a very noisy environment, especially if their room was across the hall from the nursing station. One beneficiary noted that nurses *"all go there [the nursing station] and visit.*" Many beneficiaries reported they *"could hear the employees talking down the hall"* and complained about the loud PA system. They noted that every time a baby was born in the hospital "bells chimed," which became irritating after a while. Most beneficiaries attributed some of the noise to the shared rooms, which were much noisier because their roommate or roommate's family would talk loudly or turn the volume up on the television. Even beneficiaries receiving care at the one community hospital that had private rooms remarked that the noise level was quite high: *"You could hear the employees talking down the hall."*

The private rooms in specialty hospitals are convenient. In the specialty hospitals we visited, private rooms were the norm. In some specialty hospitals, private rooms were also decorated, sometimes including hotel-like linens. Rooms also tended to feature wood cabinets that concealed many of the typical hospital room equipment, creating a more home-like environment. Private bathrooms were the norm. A few of the hospitals took the patient amenity focus to the extreme in providing toiletries, room-service type menus for patients and families, and, in one case, flowers on food trays. We found these types of amenities more at the heart hospitals, but also across the range of specialty hospitals.

Beneficiaries in our focus groups felt that private rooms were very important and reduced the inconvenience and noise usually associated with hospitalization. This was consistent for all types of specialty hospitals. As one beneficiary commented:

> *"[The] privacy of the room and the size of room makes all the difference in the world…I would not hesitate to recommend that to anybody that has to come in for a procedure. If you go to [another hospital] it's in a semi-private room, they have to move anything you have on your side of the bed to get to the other bed to close the curtain…."*

Private rooms offered a quiet environment conducive to sleep and recovery. According to one beneficiary, "I could actually sleep," which he felt was unusual in a hospital setting. Beneficiaries also noted that large private rooms were able to accommodate the needs of their family. One participant stated:

> *"If your illness is severe, you have family members there with you. If you're in a room with another individual that has a more serious illness than you and he or she has an overabundance of people visiting, which they want to do, it's hard to have a curtain*

blocking anything. There's no privacy whatsoever. And they leave you a chair or two, and you're going to have more people than that."

Beneficiaries felt the accommodations made for family were unusual compared to community hospitals. One beneficiary remarked that when she came out of surgery,

"I had a whole hoard of people waiting for me…they were all there in the room waiting for me. If you had a bigger hospital, I don't think they would have allowed that."

Beneficiaries from our focus groups receiving care at the community hospitals commented at length on the inconvenience of sharing a hospital room. Several beneficiaries related stories of sharing rooms with people who were loud, belligerent, or required fairly intensive care. One woman stated that her roommate always had the television volume "a bit higher than I would like." Another beneficiary noted:

"It seems like when you are in a double room, which most of us are, and the two patients are on different schedules for medicines or their tests, you might get somebody to wake you up at 1 and then they come into the other patient at 2…you might be awake 4-5 times during the night whether they are taking care of you or taking care of the other person…but there's nothing you can do about that, I guess–that's expected."

Other beneficiaries remarked that large families were difficult to accommodate in shared rooms. If a roommate's family was large it was uncomfortable, especially if the family had unruly children or there were arguments between family members.

It is noteworthy that the beneficiaries from our focus groups who went to community hospitals expected a certain level of inconvenience with the hospitalization, including noise and shared rooms. This was not expressed as dissatisfaction but rather described as the expected norm. On the other hand, beneficiaries at specialty hospitals, especially those who experienced both a specialty hospital and community hospital, were pleasantly surprised to find an environment that was quiet and offered the privacy and family friendliness that they agreed was conducive to a positive experience.

Family members were encouraged to stay overnight and treated well by staff at specialty hospitals. In the majority of the specialty hospitals site visits, there were fully reclining chair beds where a family member could comfortably spend the night. This importance of accommodations for family members was echoed in our focus groups. All beneficiaries in our focus groups receiving services at a specialty hospital reported that family members were encouraged to spend the night where the rooms were equipped with beds (or recliners) and the staff provided blankets, pillows, and food. One beneficiary remarked,

"I think this is what's head and shoulders above any other hospital I've been into: the convenience for the family members right there in the room."

Several beneficiaries also reported that the nursing staff took excellent care of the family as well as the patient:

"They took care of him as well as they took care of me."

When asked how important it was to them, beneficiaries responded that the ability for family to stay with them helped with the recovery process:

> *"You feel more comfortable…your family feels more comfortable and you are able to recover."*

Patients at one of the community hospitals also reported that recliners were available in their room and one woman reported that the nursing staff brought her husband a bed. However, this was not a common experience. One beneficiary remarked that the rooms were "pretty small" and didn't really have "enough room to accommodate another person" so her husband wasn't able to spend the night.

6.3.2 Patient Perspectives on Clinical Care

Nurses in the specialty hospital were very available and attentive. In our site visits, we found that specialty hospitals attempted to foster high patient satisfaction with clinical care. Probably the biggest difference between specialty and community hospitals in this regard is nurse staffing ratios. Specialty hospitals tend have 3 or 4 patients per nurse in the regular units; and 1 to 1 in the cardiac intensive care units at the heart hospitals, and 1 to 3 in the telemetry unit. Community hospitals in the same markets also have high (1 to 1 or 1 to 2) ratios of nurse to patients in intensive care and telemetry units; however, in the regular care units they may have as many as 10 to 12 patients per nurse and rely heavily on nursing assistants.

During the site visits, we were told that the specialty hospitals used few nursing assistants and relied on registered nurses for patient care. This meant that nurses were very available to the patients and tended to know patients and family members reasonably well. This ratio of nurses to patients also inevitably allowed nurses to respond more quickly to patient needs. In a few specialty hospitals, a nurse followed the patient throughout their stay. Specialty hospital staff reported that the ability of nurses to have more time to devote to each patient was an important factor in patient satisfaction. In addition, the specialty hospitals we visited tended to devote specific nursing resources to patient and family education, both before and after the hospital admission.

Site visit teams observed that some specialty hospital amenities were focused more on clinical care than aesthetics. For example, while the rooms looked more "home-like" they were equipped with state-of-the-art electrical, suctioning, oxygen, and monitoring equipment.

Overall, beneficiaries in our focus groups who went to specialty hospitals were "effusive" about the nursing care. This topic stimulated a great deal of conversation and was discussed at length. Most participants wanted to relate positive anecdotes about the nurse or group of nurses that had treated them and several beneficiaries remembered their nurses by name. In contrast, beneficiaries who went to community hospitals were generally complimentary about the nursing care they received, but did not discuss the topic at length or with the same level of enthusiasm.

Most beneficiaries receiving services at specialty hospitals reported that nurses were extremely attentive, often checking on them every 30 minutes or so throughout the day. According to one beneficiary,

"They [the nurses] were always there; in fact sometime they were there without asking."

Most beneficiaries who went to a specialty hospital had similar experiences with the nursing staff, reporting that they "never had to ring for a nurse" because the nurses "just came by that frequently to check" on them for the duration of their hospitalization. When asked if they felt the effects of the nursing shortage, almost all beneficiaries treated in specialty hospitals said they had not, remarking that the specialty hospitals were "probably better staffed than any other hospital" to which they had been admitted. Beneficiaries often compared their experience to their last hospitalization, rating nursing care at the specialty hospital far superior to the care they received at community hospitals. Additionally, most beneficiaries appreciated that RNs, rather then nurse assistants or techs, provided most of the care they received while hospitalized. One beneficiary reported:

"You had a nurse who was there… you see your nurse. A lot of hospitals you go to you don't see a nurse unless you're passing meds or you get a shot."

In contrast, most beneficiaries receiving services at community hospitals reported long wait times for RN care. Several of them reported only seeing an RN 3 or 4 times throughout the day. One remarked:

"I absolutely had to wait for a nurse. Nurses just were…didn't care if they came in or not to give you anything. I was waiting to eat dinner and I was waiting on my insulin shot and the nurse was outside in the hall and I thought I should get it before I ate…so I didn't get it for a long time until after I ate. They only came in 3 times a day."

Problems with the availability of the nursing staff were less pronounced in the Fresno site, possibly due to California's emphasis on nurse\patient ratios. Despite long wait times, beneficiaries receiving services at a community hospital were generally "satisfied" with the nursing care. Many felt the nurses were personable and well qualified. One beneficiary remarked that the nurses "cared about you, they were very skillful, very friendly." Another reported,

"I was very satisfied that the person who was performing what I need to have done was qualified."

Many beneficiaries in our focus groups seemed hesitant to criticize the nursing staff at community hospitals, indicating that the nurses themselves could not be held responsible for the long wait times. Rather, beneficiaries saw this as a result of the apparent shortage of nurses and subsequent staffing problems. In addition, several beneficiaries remarked that the nurses "work very hard" and "need to be appreciated for what they do." One beneficiary stated that nurses work with many difficult patients and they "do a good job of it."

Perceived high level of nursing care distinguished specialty hospitals from acute care general hospitals. Beneficiaries in our focus groups thought that the level of knowledge and specialized skills of the nursing staff differed greatly between specialty hospitals and community hospitals. In general, beneficiaries at specialty hospitals felt that the nurses were more attentive and knowledgeable. Those who had been hospitalized previously for a serious condition, compared their experience to being in an ICU at a community hospital. Many

beneficiaries from our focus groups receiving services in specialty hospitals also remarked on the quality of the nursing assistants and techs:

> *"The quality of the nursing assistants is also very good" and "the nurses' aides were good too."*

Beneficiaries receiving services at specialty hospitals felt the nurses were very knowledgeable about the specialty area, which made patients feel they would be well taken care of. This topic was brought up by the patients in the specialty hospital focus groups, and in particular the heart hospitals. Additionally, the specialty hospital focus group participants reported feeling comfortable asking the nurses technical questions about their treatment or procedure. Specialization and experience were seen as a benefit by many beneficiaries:

> *"I felt like the nurses were trained in that specific area and therefore we didn't have to do as much explaining to them about what we felt was going on with our bodies."*

One beneficiary remarked that the confidence the nurses demonstrated and knowledge they had helped to relieve many of the fears he had when going into surgery:

> *"They made me feel so comfortable…it's scary when you are going in for this kind of stuff…but they had me ready to go in. You know…I'm ready to take it on. They talked to me...They explained the procedure and this one nurse told me they had 98% of people coming out okay."*

Remarks about the specialized knowledge of nursing staff were not offered by beneficiaries at a community hospital, except in the context of the ICU. Beneficiaries from our community hospital focus groups were aware that the ICU nurses in community hospitals often specialized in a specific area of medical care and viewed this as a benefit. Participants in the community hospital focus groups stated that information regarding procedures was the purview of the doctors not the nurses.

Nurses at specialty hospitals were compared with ICU nurses at community hospitals. Many beneficiaries in the focus groups felt they received a higher level of care from the nurses at specialty hospitals and several compared it to that in an ICU at a community hospital. One beneficiary:

> *"I felt like I got intensive care there compare to other hospitals. If I called for them…they didn't come on and say, What do you want? They were there. They checked on you often, they were considerate of your injuries and knew how to handle them."*

Another beneficiary from a specialty hospital focus group explained:

> *"[The] heart hospital is divided up into sections and certain people take care of you."*

Several beneficiaries from each community hospital remarked that the ICU nurses were extremely good and the nursing shortage was not as apparent in the ICU. Beneficiaries remarked that in community hospital ICUs "the nurses seemed to be more available" and were "always there when you needed someone."

Many beneficiaries from community hospitals commented that when they left the ICU, the nursing care was not as good and nurses were not always available. One beneficiary remarked that the nurses in the ICU *"seem to have a good relationship with the doctors."* Another said that the *"doctors seem to trust nurses in the ICU…they work well together."* Nurses were also thought to be "more knowledgeable in the area" which contributed to the good doctor-nurse relationship. Some beneficiaries felt that the excellent nursing care in ICU may have been due to the way the staff was organized:

> *"Instead of having a block of rooms, all the nurses on the floor work as a team, backing each other up."*

According to one beneficiary, the ICU had

> *"four nurses per room, they don't assign nurses to one room. Whenever you need a nurse they're right there."*

The comments made by community hospital participants in our focus groups about ICU nurses were very similar to those made about the entire nursing staff at the specialty hospitals.

Beneficiaries in specialty hospitals did not experience language barriers. Several beneficiaries from all three community hospital focus groups reported having problems communicating with some of the nurses. These beneficiaries reported that hospitals employ foreign nurses that "can't understand simple requests." One reported: "Many of nurses don't understand English." This difficulty was not raised as a topic of conversation by patients who went to a specialty hospital. In fact, one reported that nurses in the specialty hospital

> *"…speak English so you can understand what they're saying the first time they say it."*

Another beneficiary even stated that the specialty hospital seemed to have hired nurses with specific language abilities because as a unit the nurses "spoke just about every language you would find" in the area.

Beneficiaries often choose the doctor rather than the hospital. Across all types of hospital settings, beneficiaries in our focus groups reported choosing their hospital based on a referral or recommendation by their doctor. More than half were referred to a specific hospital by their physician, either because that was where their physician admitted patients or because that hospital was convenient for the beneficiary (i.e., close to home, near family). Of those beneficiaries that were offered a "choice" of hospital (i.e., their doctor suggested two or more hospitals to which they could be admitted), nearly all of them had gone to a specialty hospital. In fact, only four of the 29 beneficiaries receiving services at a local community hospital reported explicitly being offered a choice of hospital. Several beneficiaries reported that their doctor offered them a choice of hospital but expressed a preference for working at the specialty hospital. One beneficiary reported her doctor told her he wanted to do her surgery at the heart hospital because it was the "only place he liked to practice."

Loyalty, to physician and hospital, also plays an important role in beneficiary choice of hospital. Several beneficiaries, most of whom received services at a general hospital, reported "always" choosing the same hospital. One beneficiary remarked:

> *"I go to (acute care general hospital) every time I go in. They say that's my home away from home."*

Many beneficiaries felt they had built relationships with the nurses and doctors at their hospital of choice and did not want to go anywhere else. One beneficiary reported feeling loyal to the community hospital because it had been a part of the community for a long time and had a positive impact on the city (i.e., employed local people, provided good care). One beneficiary in one of the specialty hospital focus groups reported feeling "disloyal" for going to the specialty hospital because she had gone to one of the acute care hospitals for all her previous procedures. This feeling of loyalty was not raised as an important topic of conversation in the specialty hospital focus groups, perhaps because the specialty hospitals were newer and they or their families did not have extensive experience with them. More often than not, beneficiaries focused on services as a reason to return to a specialty hospital; the topic of loyalty was not raised during the course of the discussion.

A few beneficiaries from the focus groups said that they went to a specialty hospital because they believed that it was the only hospital in the area doing a specific procedure or treatment. One beneficiary remarked that the

> *"only reason I ended up over there…at the time the (name) Heart Hospital was the only one who would take a patient for that treatment."*

Another participant added that there was

> *"one procedure to deal with aneurisms that only the Heart Hospital does."*

Beneficiaries reported problems and complications across all settings. Beneficiaries in our focus groups from both specialty and community hospitals reported complications or problems with some aspects of medical care. One beneficiary who went to a specialty hospital reported having to come back to the hospital due to a blood clot from the catheter while another beneficiary reported a blood blockage:

> *"They put a stent in…it got twisted or blocked, got to the point where I couldn't even walk."*

According to another beneficiary, he was given an antibiotic to which he was allergic. Four beneficiaries reported difficulties with IV insertion, bruising, bleeding, or repeated attempts to tap the vein. Interestingly, issues related to IV insertion and drawing bloods were brought up by one of the heart hospitals that we visited. This hospital opted to train nurses rather than add phlebotomists to the staff. They noted that patient experience and satisfaction data showed that patients saw nurse competency in this area to be a problem. They provided more training and monitored patient satisfaction data until they saw that satisfaction went up as the nurse's experience improved. Two of the patients who mentioned IV insertion and blood drawing issues had been hospitalized at this same hospital during the same time period. Most of the beneficiaries reporting complications felt the experience was exceptional rather than the norm.

Beneficiaries who went to community hospitals reported complications with their hospitalization as well. One beneficiary said that he caught pneumonia while hospitalized and another was discharged with strep throat. Another beneficiary was sent home with blood in his catheter. The hospital told him it would "go away," but he ended up returning to the hospital under the care of an urologist.

6.3.3 Overall Patient Perspectives

Beneficiaries treated in specialty hospitals knew about physician ownership before going there and many thought it was a positive thing. In our site visits, staff at specialty hospitals described the physician owners as very involved in every aspect of patient care. The physicians monitored patient satisfaction data, established a culture that focused on patient satisfaction, and were viewed by the staff as being very approachable and amenable to suggestions to improve care processes. All the patient satisfaction survey data that we reviewed showed very high patient ratings of their physicians. This is the case for specialty as well as community hospitals. Patients, particularly elderly Medicare patients, tend to rate their physicians and the care they receive from their physicians very highly. This is the case regardless of where they receive care.

When asked in our specialty hospital focus groups if beneficiaries knew the hospital was partially owned by physicians, most stated that they had known prior to hospitalization. In two of the focus groups, most beneficiaries reported hearing about the physicians' ownership of the hospital through the local media (i.e., newspaper and television) while one group reported hearing from family and friends. Several beneficiaries in two groups reported being asked to sign a form at admission that disclosed the ownership of the hospital. The few beneficiaries treated at a specialty hospital that did not know about ownership prior to hospitalization reported that they learned about it from the hospital staff (i.e., nurses, techs, doctors) at some point during or after their stay.

Throughout the specialty hospital focus group discussions, most beneficiaries agreed that physician ownership was a positive factor that probably contributed to how well they felt the hospital was run. Beneficiaries voiced three major reasons for why they felt physician ownership was an additional benefit:

(1) doctors take pride in their hospital and want to sell the "best product they can";

(2) doctors have a choice about who they hire and the rules, policies and procedures used by the hospitals; and

(3) doctors have a focus on patient care so patients are treated better. One beneficiary commented:

"The doctors all take pride…in their ownership. If they run something they want it to be the best."

Another beneficiary added:

"I think they care more because their name's on it…they own it…. It's just normal that they would put more into it. They are going to lose business…if you hear word of mouth…don't go there, if it's a bad place."

Several beneficiaries agreed that the doctors "*would give you the care that they would want to have.*" Many beneficiaries also felt that patients benefit from the doctor's ability to choose their staff:

"They have a choice about what type of people they hire. At other hospitals doctors don't have that choice. That's why I feel like I had such good care because they had such excellent people on staff."

In addition, one beneficiary felt that if doctors could make their own rules and policies, patients would benefit. There was also discussion suggesting that doctors who are patient oriented would create an environment that "focuses on the needs of the patient rather than the needs of the doctor." According to one beneficiary:

"It's not so much that the doctors own it, but that that physician group has historically had that attitude about patient care." However, one beneficiary pointed out "that could change…as the doc that started it leave…the doctors that move in might be more oriented toward making money."

"**Word-of-mouth" influenced beneficiary choice of hospital.** Many beneficiaries from our focus groups who chose to go to a specialty hospital reported hearing "good things" about the hospital from friends or family members prior to hospitalization. Recommendations led several beneficiaries to request that their doctor use the specialty hospital for their procedure. One beneficiary remarked:

"My doctor originally wanted me to go to another place…and I said, well, can I go to the Surgery Center, and he said sure."

Another beneficiary reported "jumping at the chance" to go to the specialty hospital when her doctor suggested it. Several participants were curious about the specialty hospital and decided to "give it a try."

The role of the ER differed across specialty hospitals. In our site visits, we discovered that specialty hospitals differed significantly with respect to the size and role of their emergency rooms. Participants in our focus groups also noticed differences in the ERs of specialty versus community hospitals. In two of the three heart hospitals that had some level of ER, the few patients who were admitted through the ER reported an excellent experience at the ER. In the third, patients did not know the hospital had an ER. Several beneficiaries reported that the heart hospital ER was quick and efficient and physicians took the time to talk with them. One specialty hospital focus group participant remarked:

"They took me right in, that's the first time I've ever had that experience in an Emergency Room. They had my room set up when I got there."

Another remarked:

"I've never had the attending physician come and sit down with me…that always impresses me when a doctor comes in and sits down…He talked about all my tests, what was going on, what they were going to do."

In comparing the ER at the heart hospital with the community hospital, one beneficiary felt the service at the heart hospital was exceptional:

"I had been to other ERs…I thought the difference was quite pronounced because they took me in and put me in a room and a regular practicing physician came right away to see me. And they did a lot of tests and he came back several times to talk to me and tell me how the tests were going."

Measuring Patient Satisfaction. During our site visits, we found that both specialty and community hospitals conduct patient satisfaction surveys. Both types of facilities reported high levels of patient satisfaction. Specialty hospitals reported that concerns or problems identified through the patient surveys were immediately addressed. For example, one of the heart hospitals reported that prior to opening the hospital they decided to eliminate phlebotomists and train nurses to draw blood and start intravenous lines. Initial patient satisfaction data regarding nurse competency specific to these tasks showed that patients did not rate the nurses highly on these activities. The hospital responded by increasing training and monitoring patient ratings, and as the nurses became more experienced patient satisfaction in this area increased.

The administrative, nursing, and medical staff at specialty hospitals recognized the value of high patient satisfaction scores and believed that positive patient experiences would result in more patients choosing their facility. One surgical specialty hospital went as far as to send personnel to a Ritz-Carlton program to learn the basics of a customer service focus. This focus became part of the culture of the hospital and was emphasized by staff at all levels, from the CEO to nurses. Staff at specialty hospitals viewed that the smaller size of their hospitals and the generally closer working relationships between all levels of staff enabled problems to be recognized and addressed more quickly than in community hospitals where real change required many bureaucratic hurdles. Specialty hospital staff felt that it was more feasible to maintain a true patient focus in their facilities.

During our site visits we found that specialty hospitals were actively collecting patient satisfaction data. We asked for copies of any reports and data hospitals had available. Many were using vendors, such as Press Ganey, who provide patient satisfaction reports and benchmark results to peer hospitals. We also found that specialty hospitals participate in state efforts to collect satisfaction data; for example, both specialty hospitals we visited in Fresno participated in the California Hospital Experience Survey in 2004 and were able to provide us with data that showed their results benchmarked to other hospitals in their community and all hospitals state-wide.

Although patient satisfaction data can be quite useful for a hospital in monitoring trends over time, it must be noted that, overall, satisfaction tends to be quite high. Older adults in particular tend to rate satisfaction and experience very highly. In addition, satisfaction surveys are not standardized and typically have low response rates; for some specialty hospitals with few beds and a low census, it means that estimates are generated on a small and possibly skewed sample. While the HCAHPS effort was initiated to address this issue, for now, it is not feasible to analyze the reports we obtained from specialty hospitals using quantitative methods. Instead, we ascertained whether the patient perspective is obtained and how the data are used for improvement. In several cases, where the specialty hospital participated in state efforts to collect and publicly report such data (e.g., California Hospital Experience Survey) there is statistical significance testing of differences in specialty hospital performance relative to peer hospitals in the community as well as with overall state averages. In these cases, specialty hospitals perform

very well relative to their community peers and state averages. However, to allow a direct comparison of patient satisfaction between specialty and community hospitals, a survey specific to this goal would be needed.

6.4 Conclusions

Based on our findings from site visits and focus groups, patients have responded very favorably to specialty hospitals. Patients who have received care in specialty hospitals value highly their amenities. In particular, we found that patients responded positively to the following characteristics of specialty hospitals:

- private rooms
- quiet environment
- accommodations for family members
- accessibility and attentiveness of nursing staff
- specialized training of nursing staff
- specialized procedures and treatments offered

Patients clearly viewed these amenities as contributing to their recovery. Furthermore, patients who received care in specialty hospitals also give high marks to the nursing staff, primarily because of their increased accessibility to patients and their specialization on particular conditions. Patients do not seem to find physician ownership problematic; rather, they view the arrangement as potentially enhancing quality by increasing the physician's attentiveness to the caliber of the staff and quality of care.

While the level of patient satisfaction we observed was very high in specialty hospitals, community hospitals also experienced high levels of patient satisfaction, in general, and their patients regarded these facilities as "their hospitals" and professed high levels of loyalty to them.

Our data do not allow us to conclude that Medicare patients at specialty hospitals are more or less satisfied compared with those at community hospitals. We do conclude, however, that specialty hospitals actively seek patient satisfaction information. And they value and monitor this information and use it to alter processes in order to provide better care and service.

SECTION 7
UNCOMPENSATED CARE AND COMMUNITY BENEFITS

In this section we consider uncompensated care and community benefits contributed by the physician-owned specialty hospitals. The policy issue relevant to this report is whether, and in what form, physician-owned specialty hospitals, provide uncompensated care or other community benefits. Concerns have been raised that these physician-owned specialty hospitals exist primarily for the purpose of generating profits for their physician owners. As such, they may contribute little to the overall community in which they exist. A related issue is whether or not specialty hospitals participate in any public insurance programs, such as Medicare and Medicaid; or do they derive most of their revenues from private insurance, which may be more lucrative. In this section we present our findings regarding uncompensated care and community benefits for the physician-owned specialty and not-for-profit (NFP) competitors in the six site visit sites described earlier in this report. Although there were for-profit general acute care hospitals in some of the sites visited in this study, they have been excluded from the analyses presented here because the data required to perform the necessary analyses are not publicly available and would have required a special request made of these facilities for data not routinely reported.

The primary questions to be addressed in this section are as follows:

- Do physician-owned specialty hospitals provide uncompensated care and other quantifiable community benefits?

- If so, how do the *net* benefits provided by physician-owned specialty hospitals compare with not-for-profit competitors in the marketplace? (Although payments received by hospitals are often fungible and can be used for funding any activity, society may view payments earmarked for indigent care as being provided for only that purpose.)

- Do specialty hospitals participate in public insurance programs? If so, how does their participation compare with competitor hospitals?

We first provide an overview of the major policy and methodological concerns surrounding net community benefits: uncompensated care, taxes paid, and the imputed value of tax exemptions for not-for-profit hospitals. We then describe the process for estimating these quantities. The third part of this section presents the results of our analysis and discusses the findings.

There are some significant limitations of this analysis that should be considered when interpreting the results. First, hospitals from only six cities around the country were included; it was not feasible given the short timeframe of the study to include a larger sample. Second, we do not have data on Medicaid revenues or costs to determine the magnitude of any excess of Medicaid costs over revenues, which are plausibly community benefits since they help poor patients. We also do not have data on any payments by local or state governments that hospitals may receive specifically earmarked and intended for indigent care. Thirdly, these analyses are limited by the availability of key financial and ownership data. For example, it is not possible to exactly measure the income taxes paid by the individual owners of the specialty hospitals; they

must be imputed. Likewise, the true value of the NFP tax exemption is very difficult to determine because we cannot observe the counterfactual situation in which there are no tax exemptions. Fourth, we cannot consistently quantify community benefits other than uncompensated care provided by hospitals (specialty or NFP competitor) that may be valued by their communities.

7.1 Understanding Uncompensated Care and Community Benefits

Despite the growth of the for-profit hospital sector over the past two decades, the vast majority of acute hospitals are not-for-profit (NFP) organizations. Relative to for-profit hospitals that must pay a variety of taxes on their operations and profits, NFP hospitals are free from the obligation of paying these taxes. Federal, state, and local governments exempt these hospitals from paying taxes on their mission-related operations in order for them to provide "community benefits" (U.S. Internal Revenue Service, 1969; Noble, Hyams, and Kane, 1998). However, there has been controversy surrounding whether at least some not-for-profit hospitals meet their community benefits obligations (Pimley, 1997; Frizzel, 1998; Kane and Wubbenhorst, 2000).

7.1.1 Origins of Community Benefits

Not-for-profit organizations often arise when markets (populated by for-profit firms) fail to provide desired goods or services (Weisbrod, 1988). Many NFP hospitals were started for charitable reasons. Prior to public insurance programs such as Medicare and Medicaid, not-for-profit hospitals opened as places providing indigent care (Noble, Hyams, and Kane, 1998). Many of them were started by religious organizations or local philanthropists.

However, the creation of large public health insurance programs such as Medicare and Medicaid reduced the need for private hospitals to provide indigent care (since the elderly and poor were generally the medically indigent at the time). This contributed to a reduction in the amount of indigent care provided as a proportion of total hospital volume.[38] Since then, hospitals have expanded their charity missions to include providing unprofitable services, such as burn units, trauma centers, and outreach clinics in underserved areas, providing stand-by health care capacity 24 hours per day, seven days per week, conducting disease prevention and health promotion activities; conducting medical research; and providing local employment (McManis Consulting, 2005). To the extent that these services are valued by the community, they represent a "community benefit." Unfortunately, determining the true value to the community of these alternative "missions" is very difficult, if not impossible. The Catholic Health Association

[38] In fact, the introduction of the Medicare and Medicaid programs spurred the IRS, in a 1969 Revenue Ruling, to revise its interpretation of what was required of hospitals to retain charitable status.

(CHA), a leadership organization for many of the NFP hospitals in the U.S., does give its members guidelines to use for classifying services as mission-related or not.[39] However, not all NFP hospitals may follow these guidelines, and even fewer publicly report their performance in accordance with these guidelines.

Providing care to the medically indigent and other community benefits can cost significant resources, and federal, state, and local governments have generally provided these hospitals with a variety of tax benefits in recognition of the burden of providing charity care. These tax benefits include: (1) an exemption from paying federal, state, and local taxes (income, sales, and property); (2) access to tax-exempt debt financing; and (3) allowing individual donors to deduct contributions to a NFP hospital from their taxable income. In this report we focus exclusively on the first benefit, an exemption from paying taxes, because of the difficulty in determining the benefit to society of tax-exempt financing for these hospitals and of permitting donations to these hospitals to be deductible from individual income taxes.[40]

7.1.2 IRS Tax Code and Community Benefits

An NFP organization must satisfy three basic criteria to be considered as a tax-exempt charitable organization, according to Section 501(c)(3) of the U.S. tax code:

- Earnings cannot "inure to the benefit of any private shareholder or individual." Generally, this means that there are no individuals (owners) with residual claims on the organization's retained earnings and that the board of directors consists of members of the community.

- The organization cannot spend more than a certain amount on lobbying or grassroots expenditures in order to influence legislation, and it cannot attempt to intervene in political campaigns for specific candidates.

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[39] In its *Community Benefits Reporting* guidebook (CHA, 2005), the CHA advises that for an activity to be declared a community benefit, it must generate a low or negative margin; provide for needs of special populations (the poor, frail elderly, HIV patients, etc.); or provide a service that would be cancelled were the decision made only on a financial basis. In addition, the CHA guidelines state that an activity can only be considered a community benefit if the following conditions hold: (1) the activity addresses a community need; (2) the activity supports the hospital's mission; (3) the activity is designed to improve health; (4) the activity produces a measurable community benefit; (5) the activity "passes the 'laugh' test;" and (6) the activity requires subsidization.

[40] Computing the value of tax deductions for individual owners is complicated by the fact that many hospitals have created separate supporting organizations (such as foundations) that collect donations intended to benefit the hospital. The full value of individual donations therefore cannot be determined using the hospitals' own financial statements but also those of the supporting organizations. Identifying all donations for specific hospitals would be difficult, if not impossible, in many cases.

- The organization must be operated exclusively for a charitable purpose.[41]

For hospitals, IRS Revenue Ruling 69-545 defined "operating for a charitable purpose" as *treating Medicare, Medicaid, and other publicly-insured patients, as well as indigent patients.* Revenue Ruling 83-157 refined the policy to *not require a NFP hospital to operate an emergency department (ED) if local health authorities certify that the ED would be duplicative of other EDs in the community*. In other words, for exemption from federal corporate and individual income taxes a NFP hospital need not provide much, if any, care to medically indigent self-pay patients. *Treating patients insured through Medicare or Medicaid is sufficient to retain federal tax-exempt status.*

Many state and local governments consider the federal rules to be sufficient for their own community benefit requirements. However, some states (California, Pennsylvania, Texas, Utah, and Vermont, among others) have articulated a higher standard of charitable behavior for tax-exempt hospitals (Noble, Hyams, and Kane, 1999). The higher standards generally put greater emphasis on the provision of free or discounted care for the medically indigent as a community benefit worthy of exemption from state and local income, sales, and property taxes (although other activities are also recognized). Since, as described in Section 7.2, sales and property taxes must be paid regardless of a company's profitability, it is possible that the state and local tax exemptions are worth more than the exemption from federal income taxes. In fact, evidence suggests that state and local tax exemptions are indeed more valuable (Kane and Wubbenhorst, 2000).

In addition to tax exemptions, federal, state, and local governments provide additional assistance for specifically providing uncompensated care. For example, hospitals can receive a payment from the Medicare program for up to 70 percent of Medicare bad debts (patient nonpayment of deductible or co-payment amounts).[42] Furthermore, state and local governments can, and do, make separate payments to hospitals for treating medically indigent patients (e.g.,

[41] Section 501(c)(3) of the U.S. tax code also exempts organizations operating exclusively for religious, scientific, or educational purposes, and also those supporting amateur sports or the prevention of cruelty to children or animals, as long as they do not violate the non-inurnment and limitation of political activities provisions. Section 501(c) more broadly identifies a number of other organizations that are exempt from federal taxation, including civic leagues, fraternal clubs, private cemetery companies, and organizations of present or past members of the U.S. Armed Forces.

[42] Beginning in federal fiscal year 2001, Medicare pays for 70 percent of "reimbursable bad debts" (percentages varied in prior fiscal years). Reimbursable bad debts are bad debts for deductible and co-payment amounts of patients classified as indigent according to a hospital's indigent care policy or those for which the hospital made reasonable (not token) collection efforts for at least 120 days.

through charity care pools or operating subsidies to specifically offset costs of providing indigent care).[43] Although payments to hospitals are generally fungible and used to finance any and all hospital activities, communities may consider payments made by their local and state governments specifically for indigent care as being earmarked for that purpose. For example, suppose a community gives a hospital a million payment intended to offset costs of providing indigent care. If the hospital provides indigent care that costs less than $1 million the community may feel the hospital is not meeting its obligations, even if there is no formal contract requiring a $1 million worth of indigent care be provided. However, as discussed in Section 7.2.3, these indigent care payments could not be included in the analysis. Therefore, the estimates of net uncompensated care provided by NFP competitor hospitals may be somewhat overestimated.

7.1.3 Study Definitions of Community Benefit

For this study, *we narrowly define "community benefits" as the cost of providing uncompensated care to the medically indigent*. This definition excludes other community assistance and mission-related services that may be operated as a deficit. We therefore only consider the cost of charity and bad debt for medically needy patients; however, it is important to recognize that this will be, to some degree, an underestimate of the full community benefits provided by the hospitals (both specialty and NFP competitor).

To illustrate the various "community benefits," other than charity care, reported by hospitals, including the very different definitions of community benefits used, consider the following examples from two NFP competitor hospitals in our study, as summarized in ***Table 7-1***. Hospital A reported several types of community benefits, including charity care, other programs, and "unpaid costs of Medicare and Medicaid patients." Of these, the unpaid costs of Medicare and Medicaid patients was by far the most costly. These reported community benefits account for 12.1 percent of Hospital A's total operating revenue (TOR), but charity care accounts for only 7.4 percent. Excluding the unpaid costs of Medicare and Medicaid, charity care itself accounts for about one-half of the remaining reported community benefits. Hospital B, on the other hand, did not include any unpaid costs of Medicare and Medicaid in its reported community benefits. However, its reported charity care was significantly larger (5.8 percent of TOR) than the cost of other programs (0.5 percent of TOR), and accounted for 92 percent of all community benefits not related to Medicare and Medicaid costs. Hospitals' reporting of community benefits, obviously, is not standardized, and the amount attributable to charity care varies significantly.

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[43] There is considerable debate regarding whether *Medicare* Disproportionate Share Hospital (DSH) payments should be considered offsets to uncompensated care. MedPAC, in its March 2002 *Report to the Congress* on Medicare Payment Policy, stated, "These payments are largely unrelated to hospitals' costs for serving [Medicare] beneficiaries—DSH payments reflect revenue losses associated with furnishing uncompensated care…" (MedPAC, 2002, p. 14). Among the NFP competitors in the 6 study sites, Medicare DSH payments average 1.76 percent of total operating revenues (1.62 percent for NFP competitors in areas with a public hospital and 1.87 percent for NFP competitors in areas with no public hospitals). However, Medicare DSH payments are computed as a multiplier to a hospital's Medicare DRG payment, so a hospital with few Medicare patients but many indigent patients could receive much less than one with a much higher number of Medicare patients (as long as they have a relatively large number of Medicaid patients. We have therefore excluded Medicare DSH payments from this analysis, but do note some opinions to the contrary.

Table 7-1
Costs of "community benefits" reported by two NFP hospitals in the study sample, as a percentage of the hospitals' total operating revenue (TOR)

Hospital A		Hospital B	
Reported benefit	Cost (% of TOR)	Reported benefit	Cost (% of TOR)
Charity care	0.9%	Charity care	5.8%
Programs for the poor	0.2	Other programs	0.5
Outreach activities	0.7		
Unpaid costs of Medicare and Medicaid patients	10.3		
Total reported community benefit (% of TOR)	12.1%	Total reported community benefit (% of TOR)	6.3%
Proportion of community benefit as charity care	7.4	Proportion of community benefit as charity care	92.1

SOURCE: RTI International analyses of community benefits reports from two NFP hospitals in the study sample.

In addition to these in-kind community benefits, proprietary hospitals, including, specialty hospitals, generate taxes through their operations. Since taxes are presumably used to finance all types of public goods and benefits supported by local, state, and federal governments, they are equivalent to in-kind community benefits (e.g., hospital charity care) because they are used to finance them.[44] The NFP hospitals may be paying some taxes indirectly due to ownership of a non-exempt entity, such as a physician office. However, to the extent that these non-exempt entities would exist regardless of whether the NFP hospital owned them, they should not be considered as a community benefit nor an offset to tax exemptions.

7.2 Measuring Uncompensated Care, Taxes Paid, and Tax Exemptions

7.2.1 Hospital Sample

The hospitals included in this analysis are 10 specialty hospitals and 21 NFP competitor hospitals in the six site visit sites. ***Table 7-2*** provides summary information on the hospitals used in this analysis. Of the 10 specialty hospitals providing sufficient data for analysis, 4 are cardiac hospitals and 6 are surgical or orthopedic. Two cities with a total of 4 specialty hospitals and 10 NFP competitor hospitals had publicly-funded hospitals (i.e., "public" hospitals) in the market, 1

[44] Taxes pay for goods and services other than charity care that are also valued by the community. As a result, the taxes paid by specialty hospitals are potentially an important source of community benefits more generally and free up public revenues to better support hospitals.

Table 7-2
Selected characteristics of the specialty and not-for-profit competitor hospitals used in the uncompensated care & tax analyses

Characteristic	Specialty hospitals	NFP competitors
Number of interviewed hospitals	11	21
Final sample	10	21
Cardiac specialty	4 (of 4)	…
Orthopedic or surgical specialty	6 (of 7)	…
Number in city with public hospital	4 (of 4)	10
Number in city with no public hospital	6 (of 7)	11

NOTES: One site has a public hospital, and one other has a for-profit hospital that is contracted by the state to provide public hospital services. Four sites do not have a public, or publicly-contracted hospital. One orthopedic hospital in a city with a public hospital did not report sufficient data to determine tax payments.

SOURCE: RTI International analyses of voluntary financial reporting submissions and the CMS 2004 100% Inpatient Standard Analytic File, IRS Form 990 data, and state health departments.

government-owned, and 1 managed under a for-profit contract and subsidized by the state to provide indigent care.[45] The other four cities did not have a public hospital in the market.

7.2.2 Estimating Uncompensated Care Costs

As noted earlier in this section, we are defining the community benefits provided by hospitals to be the cost of providing uncompensated care to patients. This consists of charity care (free care for patients as specified by hospital policies, typically based on patients' assets and income) and bad debts (services for which the patient was considered able to pay but collection was unsuccessful). Unquestionably, charity care is a community benefit. However, there is significant debate about how much bad debt involves charitable intent. Many bad debtors are ineligible for charity care. A review of the literature related to how much of bad debt is for care for the medically indigent (Epstein, Lukas, and Weissman, 1992; Buczko, 1994; Sanders, 1995) suggests that, at least in some hospitals, as much as 50 percent of bad debt expense should have been considered charity care based on the medical indigency and income levels of the debtor.[46] Thus, we include only 50 percent of bad debt costs in our analysis.

[45] In February, 1998, Oklahoma entered into a joint operating agreement with a subsidiary of HCA Health Care (an operator of a chain of for-profit hospitals) to manage and operate OU Medical Center. In 2005, Oklahoma will provide OU Medical Center with between $16 and $18 million in direct subsidies for indigent care, $3 million for maintaining a Level I trauma center, and additional funding in Medicaid DSH payments.

[46] A more recent analysis for the Sate of Maine Governor's Office of Health Policy and Finance considered bad dept provision by 17 community hospitals in Maine. Found that roughly 50 percent of bad debt was incurred by uninsured (Kane, 2004). This study reinforces our assumption of a 60 percent level of bad debt for low-income people.

Uncompensated care as reported (valued at charges) were derived from a variety of sources. For the 10 specialty hospitals, the data source was an extract from the most recently available self-reported financial statements. Bad debt and charity care charges were converted to average costs by multiplying by the hospital average ratio of costs to charges reported in the hospitals' 2003 Medicare Cost Reports (MCRs). Charges forgone related to charity care and bad debts for NFP competitor hospitals were obtained, where reported, from amounts provided in annual IRS Form 990 submissions.[47] In the cases where bad debt and free care values were not included in the Form 990 submissions, uncompensated care data were acquired either from state health departments' publicly available hospital financial reports or, in one case, directly from the hospital.

Another potential source of uncompensated care for the poor excluded from our study is the difference between payments and costs for Medicaid patients. Nationally, it is estimated that Medicaid payments to hospitals are about 4 to 5 percent lower than costs (MedPAC, 2002, Table B-11). However, Medicaid discount rates vary across states and among hospitals within a state. As a result, some hospitals may have Medicaid margins well below the national average of –4 percent, and some may have positive Medicaid margins. Unfortunately, for this report we were unable to acquire Medicaid payments, charges or costs due to unreliable reporting of these data in Worksheet S-10 of the MCRs and lack of other readily available sources.

7.2.3 Public Payments to Offset Indigent Care Costs

State and local governments provide a variety of partial payments for hospitals' costs for providing care to medically indigent patients. Although some states (e.g., California) do report data on the amounts hospitals receive specifically for indigent care costs, these data were not available from all states. For example, some states combine payments for indigent care with other payments to hospitals for unrelated reasons in various annual public reports. In other cases, it could not be determined if payments were made at all. We therefore excluded these payments from the net community benefit computation.

7.2.4 Measuring Taxes Paid by Specialty Hospitals and Their Owners

The operations of the specialty hospitals are taxed in several different ways. First, as for-profit entities, they pay state sales tax on supplies and, possibly, purchased services used in the delivery of care. They also pay real estate and other property taxes to state and local governments (net of any abatements or other adjustments). Net income (profits and losses) is also taxed at the federal and state levels. Yet, since the specialty hospitals in the six study sites are organized as Limited Liability Partnerships (LLPs) or Limited Liability Companies (LLCs),the hospital organization itself does not pay income taxes. Instead, net income passes through to the individual owners, who report it on their individual income tax returns. As a result, hospital profits are taxed according to the tax status of the individual owners, who can classified in three groups: individuals, for-profit corporations (e.g., MedCath), and non-profit institutions.

[47] See Section 3 of this report for a discussion of the IRS Form 990.

Income Taxes

Since we did not have the income tax returns for the owners of the specialty hospitals, the federal and state income taxes generated by the profits of these hospitals needed to be estimated. The imputed tax payment was accomplished in three steps:

Step 1: Determine the ownership shares of individuals, corporations, and NFP organizations. Shares were reported to us by the specialty hospitals. Physicians, other individuals, and partnerships consisting of individuals were all classified as individuals for this purpose.

Step 2: Determine effective income tax rates for owners for whom the income is not exempt from taxation. The income taxes paid by individuals and corporations are not necessarily equal to the statutory marginal rates due to a number of factors, including the use of tax shelters to defer income taxes, corporate tax loss carry forwards, and various deductions available to individuals and corporations. An analysis of ownership details from the one specialty hospital reporting information on the form of ownership (direct versus through a trust or other tax deferral vehicle) indicated that up to 40 percent of ownership was through such income deferral vehicles. This figure was used as the basis for determining the percentage of deferred income across the sample. To compute the effective federal income tax rate, we multiplied the statutory maximum rate (35 percent in 2004) by the proportion (60 percent) of individual ownership not imputed to be in trusts and other income deferral vehicles (the "Effective Tax Ratio"). The use of income deferral vehicles in this one hospital may be an overstatement of their use among owners in other hospitals; in this way we are conservatively estimating the taxes paid by the specialty hospital owners in the six study sites. We also estimated personal income tax payments using the full statutory rates to determine an upper bound on tax payments.

Statutory and effective marginal federal income tax rates are shown in the first row of ***Table 7-3***. Similarly, the effective state income tax rates were computed by multiplying the statutory maximum marginal rates for each state by the Effective Tax Ratio (0.6), as shown in the remaining rows in the top panel of Table 7-3. For non-physician corporate owners, the effective federal corporate income tax rates for 2001 through 2003 were set equal to the averages, based on their annual reports, for three large for-profit hospital chains (HCA, Tenet, and Universal) in these years: 34.01 percent in 2001, 31.66 percent in 2002, and 33.3 percent in 2003. For 2004, we used the 2003 effective tax rate. An exception to this method was made for MedCath facilities, for which MedCath's effective corporate income tax rates were used, as reported in MedCath Annual Reports. Effective state corporate income tax rates were computed by multiplying each state's maximum statutory rate by the Effective Tax Ratio. These are shown in the bottom panel of Table 7-3.

Table 7-3
Statutory and effective marginal individual and corporate income tax rates used in the uncompensated care and tax analyses, 2001–2004

	Statutory marginal tax rates				Effective marginal tax rates			
	2001	2002	2003	2004	2001	2002	2003	2004
Individual Income Tax Rates								
Federal	39.10%	38.60%	35.00%	35.00%	23.46%	23.16%	21.00%	21.00%
Arizona	5.04	5.04	5.04	5.04	3.02	3.02	3.02	3.02
Arkansas	7.00	7.00	7.00	7.00	4.20	4.20	4.20	4.20
California	9.30	9.30	9.30	9.30	5.58	5.58	5.58	5.58
Ohio	7.50	7.50	7.50	7.50	4.50	4.50	4.50	4.50
Oklahoma	6.75	6.75	6.75	6.75	4.05	4.05	4.05	4.05
South Dakota	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Income Tax Rates								
Federal	35.00%	35.00%	35.00%	35.00%	34.01%	31.66%	33.33%	33.33%
Arizona	6.97	6.97	6.97	6.97	6.77	6.30	6.64	6.64
Arkansas	6.50	6.50	6.50	6.50	6.32	5.88	6.19	6.19
California	8.84	8.84	8.84	8.84	8.59	8.00	8.42	8.42
Ohio	8.50	8.50	8.50	8.50	8.26	7.69	8.09	8.09
Oklahoma	6.00	6.00	6.00	6.00	5.83	5.43	5.71	5.71
South Dakota	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: The statutory marginal tax rates shown are for taxpayers (individual or corporate) in the highest income tax bracket for each tax jurisdiction. Effective federal corporate income tax rates for MedCath facilities are set equal to MedCath's effective tax rate rather than the values reported in this table.

SOURCES: Statutory federal individual and corporate income tax rates are as reported in IRS publications. Statutory state individual and corporate income tax rates for 2001 through 2003 as reported by The Tax Foundation (2005) and for 2004 by the Federation of Tax Administrators (2005). Effective federal corporate income tax rates for the health care industry estimated from 2001 through 2003 annual reports from 3 large hospital chains.

Step 3: Compute Income Taxes Using Reported Net Income. Once effective tax rates were computed, federal and state income taxes were computed by multiplying the ownership share of each owner type (individual, corporate, and NFP) by the hospital's reported taxable net income. The product is then multiplied by the appropriate effective tax rate. Total income taxes attributable to a specialty hospital were computed by summing over the tax contributions of each owner type. From the IRS Form 990 submissions, it was difficult to determine whether income from specialty hospitals partially owned by NFP hospitals was subject to the Unrelated Business Interest Tax (UBIT).[48] This was largely due to the use of related NFP organizations or LLP holding companies, combined with transfers between related organizations. To be conservative, we assumed for this analysis that the net income apportioned to a NFP hospital owner was not subject to the UBIT. Thus, no income tax was computed for that portion of net income. In our base case analyses, we also estimated income taxes that include UBITs, paid at a 35 percent marginal tax rate, to compute an upper bound of tax payments.

[48] For NFP owners, whether taxes must be paid on the earnings from a non-exempt entity that the hospital has an ownership stake in depends on whether the owned enterprise is considered an unrelated business (unrelated to the hospital's mission). If the non-exempt entity is considered an unrelated business, the hospital must pay a tax, the Unrelated Business Interest Tax (UBIT), on the revenues from the entity as if the NFP were a for-profit corporation.

Sales Taxes

Ten specialty hospitals in the study reported tax payments in (up to) the four most recent fiscal years for the sales taxes paid to state governments. No independent verification of these figures was made.

Real Estate and Property Taxes

The specialty hospitals reporting sales tax data also reported tax payments in (up to) the four most recent fiscal years for the real estate, and property taxes paid to state and local governments. To be sure that we did not include real estate and property taxes paid by the specialty hospital for unrelated business, such as physician office buildings, we discounted the reported real estate and property taxes by 20 percent to produce a conservative estimate of the real estate and property taxes related to the hospital itself in our base case analyses. No independent verification of these figures was made. As we have done for income taxes, we also estimated a property tax payment that does not include this 20 percent reduction in order to compute an upper bound on tax payments.

Other Taxes

The owners of the specialty hospitals in this sample may pay other taxes in addition to income, sales, real estate, and property taxes. One example would be capital gains taxes (paid to federal and state governments) on realized gains from the sale of any ownership stake they may have had.[49] In one of the sites visited, the physician investors sold a portion of their ownership in the facility to another company; any taxes on the capital gains realized by the physician investors have not been included in this analysis. The sales of ownership stakes are not continuous but "lumpy," so the timing of such sales could potentially have large impacts on total taxes paid. Some annualization procedure could be used to smooth out those payments. However, since we did not have information on the capital gains taxes paid (which would have required inspection of the physician investors' tax returns), we have presumably underestimated the total taxes paid as a result of the operations of the specialty hospitals and therefore their net community benefits. Furthermore, as several specialty hospitals we visited had been running losses, we have ignored the decline in asset values that physician investors have experienced.

7.2.5 Estimating Tax Exemptions for NFP Competitor Hospitals

An alternative way of comparing tax-exempt NFPs with taxable specialty hospitals is to place a value, in dollars, on the NFPs' "tax exemption," or foregone taxes. This value is then compared with the taxes actually paid by specialty hospitals as well as the amount of uncompensated care NFPs are providing in lieu of taxes. A high value placed on the tax exemption would lower the net community benefit of NFPs on an "opportunity cost" basis.

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[49] Unlike the other taxes considered in this analysis, the capital gains tax is not a direct tax on the operations of the hospital. However, the profitability of the hospital's operations would affect its value and therefore would affect capital gains realized by owners from a sale of an ownership stake.

Since NFP hospitals do not pay taxes on operations related to their tax-exempt mission, estimating the value of the tax exemptions they receive is less straightforward than for (for-profit) specialty hospitals. In general, we follow a similar procedure to that described above for specialty hospitals' income taxes: we multiply the relevant tax rate by the appropriate tax base. However, determining the tax base is more difficult (described in detail below). In general, we followed the method of Kane and Wubbenhorst (2000) for estimating tax exemption values for NFP hospitals except where noted.

Income Taxes

Income taxes, both federal and state, were computed similarly to those of the specialty hospitals. We first assumed that the NFP competitors would be taxed at the effective federal and state corporate income tax rates used for the specialty hospitals. The income tax exemptions for these hospitals was estimated by multiplying the effective income tax rate (state or federal) by total (net) operating income, equal to net operating revenue minus net operating costs. In other words, this is net income (profits), excluding restricted income earned on donor-restricted assets, for only the part of the hospital related to its mission of providing health care. These quantities were derived either from IRS Form 990s or financial data provided to state health departments.

Sales Taxes

Generally, companies not tax-exempt must pay state (and potentially local) sales taxes on supplies used in the operations of the business (the particular set of goods and services taxable and not taxable varies from state to state). Therefore, if the NFP competitor hospitals were not exempt from paying taxes, they would need to pay taxes on the cost of their supplies. To estimate the value of the tax exemption for sales taxes, we multiply the supplies expense reported in the Form 990s or state department of health financial disclosures by the statutory state sales tax rate.

Real Estate Taxes

In general, real estate taxes are paid as a percentage of the assessed value of a hospital's property, plant, and equipment. However, real estate and property tax assessments are not generally levied on NFP hospitals (and other NFP organizations), and an imputation was required to estimate the full value of their tax exemption. We used the method described by Kane and Wubbenhorst (2000) which uses an income-based valuation model developed with the assistance of property tax consultants. The value of the hospital's property using this approach is estimated by dividing the hospitals' earnings before interest, depreciation, and amortization (EBITDA, reported in IRS Form 990s) by a capitalization rate equal to 0.128, selected by property tax consultants as a reasonable average for commercial property.

Once the value of the NFP hospitals' property, plant, and equipment was estimated, it was multiplied by an estimated average property tax rate derived from the average amount reported by the specialty hospitals in the six study sites (a single estimated property tax rate was used for all NFP competitor hospitals). This was computed by first estimating an aggregate value of the specialty hospitals' property, plant, and equipment using the valuation model described

above and imputed aggregate specialty hospital EBITDA,[50] then dividing this quantity by the actual real estate and property taxes paid by the specialty hospitals. The resulting average "city-wide" property tax rate was 65.8¢ per $100 hospital value,[51] which was multiplied by the NFP competitors' estimated valuations to compute an estimated value of real estate and property taxes.

7.3 Comparison of Net Community Benefits

We now present comparisons of the net community benefits generated by the specialty and NFP competitor hospitals in the six study cities. We first focus on a comparison that includes uncompensated care and actual taxes paid as community benefits. We also present an alternative comparison that instead of including actual taxes paid by specialty hospitals as a community benefit, includes the value of NFP hospitals' tax exemptions as offsets to the community benefits they provide.

7.3.1 Comparing Community Benefits for Specialty and NFP Competitors

The first two columns of ***Table 7-4*** present the basic computation of the net community benefits for 10 specialty hospitals in the study (first column) and the 21 NFP competitor hospitals (second column). All costs, state and local indigent care payments, and tax payments are shown as percentages of the aggregate net total operating revenues (TOR) of the hospitals in each subsample in order to adjust for differences in the average hospital size.[52]

The top panel of Table 7-4 shows charity care and (discounted) bad debt costs for the specialty and NFP competitors. NFP hospitals provided 2.48 percent of TOR as uncompensated care for the medically indigent compared with 0.97 percent for specialty hospitals.

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[50] Specialty hospital EBITDA was imputed by first computing the ratio of the sum of depreciation and interest expenses to total operating expenses among the NFP competitor hospitals, multiplying each specialty hospital's reported total operating expenses by this ratio, then adding this (positive) amount specialty hospitals' net income to impute their EBITDA.

[51] This 65.8¢ per $100 tax rate is quite low compared with the $1.53 per $100 national average found by Kane and Wubbenhorst (2000) using actual property tax rates from 1993. The difference could be due to the possibility that the states in which the 6 study sites are located have lower property tax rates than the national average or the possibility that the specialty hospitals have received rebates that have lowered their actual tax payments below the tax payments that would be computed using the statutory rates.

[52] Total operating revenues reflect the amount of revenue hospitals actually expect to be paid and so are net of contractual discounts and allowances. Using total operating, as opposed to gross patient service, revenue helps reduce differences primarily due to differences in hospital markups or other pricing policies.

Table 7-4
Net community benefits as a percentage of total operating revenues: Specialty versus NFP competitor hospitals in six cities

		NFP Competitor Hospitals		
	Specialty hospitals	All NFPs	Cities with public hospitals	Cities without public hospitals
Number of facilities	10	21	10	11
Uncompensated care costs				
Charity care costs	0.13%	1.41%	0.37%	2.29%
Excess of Medicaid costs over revenue[1]	?	?	?	?
Bad debt costs @ 50%	0.84	1.07	1.29	0.90
Total Uncompensated Care Costs	0.97	2.48	1.66	3.19
Tax payments				
Federal income (individual and corporate)	2.79%	...	...	...
State income (individual and corporate)	0.29	...	...	...
Sales	0.84	...	...	...
Real estate and property[2]	0.64	...	...	...
Total tax payments	4.55	0.00	0.00	0.00
Total net community benefit	5.52%	2.48%	1.66%	3.19%

NOTES: [1]The difference between revenues and costs for Medicaid patients is not included in net community benefits calculation due to the lack of necessary data. Medicare DSH payments also excluded.
[2]These taxes were discounted 20 percent to account for the possibility of some of these taxes paid on businesses unrelated to the operations of the hospital (e.g., physician office buildings).

SOURCE: RTI International analysis of voluntary financial data submissions (specialty and NFP competitor hospitals) and IRS Form 990 Submissions (NFP competitor hospitals).

The NFP hospitals appear to provide more uncompensated care than do the specialty hospitals in their markets, although this analysis ignores any Medicaid subsidies and payment discounts.[53]

[53] As we have noted previously, the difference between Medicaid cost and revenues is not included; if these hospitals have the national Medicaid margin of –4.1 percent (MedPAC, 2002), the uncompensated care component of community benefits could be understated by this amount multiplied by the average Medicaid volume share (which, if a relatively high 10 percent for the hospitals in this study, the understatement of uncompensated care would be about 0.4 percent of TOR). Of course, the specialty hospitals also care for Medicaid patients (from the site visit interviews, about 3-4 percent of patients), so the relative increase in the NFP competitors' community benefits (relative to that of the specialty hospitals) would be only about 0.2-0.3 percent of TOR. However, the hospitals in the six study sites could have very different Medicaid margins than the national average; because we lack these data, we have not included any Medicaid revenue shortfall.

The specialty hospitals' average tax payments are shown in the middle panel of Table 7-4. Total tax payments equal 4.55 percent of TOR, with federal income taxes comprising the majority of the total taxes paid (2.79 percent of TOR, or 61 percent of the total tax payments).[54] State income taxes account for 0.29 percent of TOR, and state sales taxes equal 0.84 percent of TOR. Real estate and property taxes average 0.64 percent of TOR.

The bottom panel of Table 7-4 presents the sum of uncompensated care costs and taxes paid by these hospitals. Using this definition, the specialty hospitals in the six cities provided a great deal more community benefit than did their 21 NFP competitors relative to their total operating revenues: 5.52 percent versus 2.48 percent.

If the limiting assumptions made about income and property taxes are relaxed, there is a marked increase in the estimate of taxes paid by the specialty hospitals. Federal income tax payments rise to 4.43 percent of TOR, state income tax payments rise to 0.43 percent of TOR, and property tax payments increase to 0.80 percent of TOR. As a result, total tax payments increase from 4.55 percent of TOR to 6.49 percent, raising specialty hospitals' community benefits to 7.47 percent of TOR. However, this is likely some overestimate of specialty hospitals' community benefits.

7.3.2 The Impact of Public Hospitals on NFP Competitors' Community Benefits

The literature has suggested that NFP hospitals provide different levels of charity care depending on whether there is a public hospital in the area (Duggan, 2002). The argument is that where there is a public hospital in a market, NFP hospitals will receive fewer indigent patients since they are likely to go to the public hospital instead. In this study, there were two sites with public, or publicly-contracted hospitals. To determine whether cities with NFP hospitals provide less charity care when there is a public hospital in the market, we divided the NFP competitors into two groups based on this criterion. The results are presented in the third and fourth columns of Table 7-4.

As shown at the top of Table 7-4, the NFP competitor hospitals in areas with a public hospital provide less charity care (0.37 versus 2.29 percent of TOR) but have somewhat higher bad debt expenses (1.29 versus 0.90 percent of TOR). In total, the NFP competitors in areas without public hospitals provide nearly double the uncompensated care as do those where there is a public hospital. However, even the NFP competitors in areas without public hospitals bear a smaller lower net community benefit burden, per dollar of revenue, than do the specialty hospitals in the study, a difference of at least 2.3 percent of TOR (an amount equal to two-thirds of their uncompensated care costs).

[54] As a percentage of operating income (total operating revenues less total operating costs), federal income taxes equal 18 percent. Since any UBITs paid by NFP owners are not included, this may be an underestimate; adding estimated UBITs would increase the effective income tax rate to about 19 percent of total operating income.

7.3.3 Community Benefits in Cardiac Versus Orthopedic and Surgical Specialty Hospitals

During our site visits, we found that most cardiac hospitals had active emergency departments (EDs), whereas the orthopedic and surgical specialty hospitals were far less likely to have an active ED. Because they have an ED, the cardiac hospitals may provide more charity and other indigent care than do the orthopedic and surgical hospitals. To examine whether this is true, in ***Table 7-5*** we separate the 10 specialty hospitals into two groups: cardiac (4 hospitals), and orthopedic and surgical (6 hospitals). The first column of this table is identical to column 1

Table 7-5
Community benefits as a percentage of total operating revenues: Cardiac and orthopedic/surgical specialty hospitals versus competitor hospitals in six cities

	Specialty hospitals			All NFP
	Total	Cardiac	Orthopedic & surgical	Competitor hospitals
Number of facilities	10	4	6	21
Uncompensated care costs				
Charity Care Costs	0.13%	0.27%	0.00%	1.41%
Excess of Medicaid costs over revenue[1]	?	?	?	?
Bad Debt Costs @ 50%	0.84	1.38	0.32	1.07
Total Uncompensated Care Costs	0.97	1.65	0.32	2.48
Tax payments				
Federal income (individual and corporate)	2.79%	0.60%	4.93%	...
State income (individual and corporate)	0.29	0.11	0.47	...
Sales	0.84	0.49	1.17	...
Real estate and property[2]	0.64	0.89	0.40	...
Total tax payments	4.55	2.09	7.06	0.00
Total net community benefit	5.52%	3.74%	7.38%	2.48%

NOTES: [1]The difference between revenues and costs for Medicaid patients is not included in net community benefits calculation due to the lack of necessary data. Medicare DSH payments also excluded.
[2]These taxes were discounted 20 percent to account for the possibility of some of these taxes paid on businesses unrelated to the operations of the hospital (e.g., physician office buildings).

SOURCE: RTI International analysis of voluntary financial data submissions (specialty and NFP competitor hospitals) and IRS Form 990 Submissions (NFP competitor hospitals).

in the previous table while the fourth column presents the same statistics for the NFP competitor hospitals. The two middle columns present the net community benefit computation for cardiac hospitals as one group and for orthopedic and surgical hospitals as a second group.

As shown in the top panel, the cardiac hospitals indeed provided more uncompensated care per dollar of revenue than did the other specialty hospitals: 1.65 versus 0.32 percent of TOR. However, the orthopedic and surgical hospitals, and their owners, paid a great deal more in taxes than did the cardiac hospitals (7.06 percent of TOR for the specialty hospitals versus 2.09 percent for the cardiac hospitals). This difference is attributable mostly to the difference in income taxes which is driven by the large difference in operating margins for these two types of specialty hospitals (9.1 percent for cardiac hospitals and 21.7 percent for the orthopedic and surgical hospitals; 15.5 percent overall).

As a result, cardiac hospitals provide a net community benefit of 3.74 percent versus 7.38 percent for orthopedic and surgical hospitals. When federal income tax payments are ignored, the apparent net community benefits for cardiac hospitals exceeds that of orthopedic and surgical hospitals. Regardless of the treatment of tax payments, the cardiac hospitals in this study still provide more net community benefits per dollar of revenues than do the NFP competitor hospitals.

7.3.4 Net Community Benefits based on Tax Exemptions

Table 7-6 presents the alternative computation that values community benefits based on tax exemptions. The results are qualitatively similar to those in Table 7-4. The top two panels are identical to those in Table 7-4; the definitions of uncompensated care and indigent care payments have not changed. The difference is in the value of tax exemptions for federal and state income, state sales, and local real estate and property taxes. The NFP competitor hospitals in the six study cities are contributing less in community benefits than they receive in support from federal, state, and local governments in the form of tax exemptions. The average shortfall is 0.41 percent of TOR. However, NFP hospitals in areas where there is not public hospital have a slight excess of uncompensated care cost burden over tax exemptions (0.38 percent of TOR). In contrast, the NFP hospitals in areas without a public hospital receive benefits well in excess of uncompensated care provided, a shortfall of 1.33 percent of TOR.

The second column of Table 7-6 presents the average tax exemption for all NFP competitor hospitals in the six study cities. In contrast to the tax payments of specialty hospitals, the value of the federal and state income tax exemptions (1.23 percent) are less than one-half of the total tax exemption value of 2.89 percent of TOR. The reason is that the average operating margin for the NFP competitors is much lower than for the specialty hospitals (3.10 percent versus 15.51 percent of TOR; see ***Table 7-7***). The total net community benefit of NFPs is –0.41 percent because their tax exemptions exceed their net uncompensated care. The implicit subsidy given to NFPs through tax exemptions more than compensates for the 2.48 percent of their revenue that they denote to treating the uninsured. Specialty hospitals, although incurring a smaller uncompensated care burden than NFP competitors, pay taxes in addition that helps support government net subsidies to NFPs.

Table 7-6
Net community benefits as a percentage of total operating revenues tax exemptions: Specialty versus competitor hospitals in six cities

		NFP competitor hospitals		
	Specialty hospitals	All NFPs	Cities with public hospitals	Cities without public hospitals
Number of facilities	10	21	10	11
Uncompensated care costs				
Charity care costs	0.13%	1.41%	0.37%	2.29%
Excess of Medicaid costs over revenue[1]	?	?	?	?
Bad Debt Costs @ 50%	0.84	1.07	1.29	0.90
Total uncompensated care costs	0.97	2.48	1.66	3.19
Value of tax exemptions				
Federal, excl. payments for indigent & poor	...	1.03%	1.19%	0.90%
State, excl. payments for indigent & poor	...	0.20	0.20	0.20
Sales Taxes	...	1.00	0.86	1.11
Real estate and property taxes[2]	...	0.67	0.75	0.60
Total Value of Tax Exemption	0.00	2.89	2.99	2.81
Total net community benefit	0.97%	-0.41%	-1.33%	0.38%

NOTES: [1]The difference between revenues and costs for Medicaid patients is not included in net community benefits calculation due to the lack of necessary data. Medicare DSH payments also excluded.
[2]These taxes were discounted 20 percent to account for the possibility of some of these taxes paid on businesses unrelated to the operations of the hospital (e.g., physician office buildings).

SOURCE: RTI International analysis of voluntary financial data submissions (specialty and NFP competitor hospitals) and IRS Form 990 Submissions (NFP competitor hospitals).

Table 7-7
Operating margins for specialty and NFP competitor hospitals in six cities

	Number of hospitals	Average operating margin (%)
Specialty hospitals	10	15.51%
• Cardiac hospitals	4	9.10
• Orthopedic & surgical hospitals	6	21.74
NFP competitor hospitals	21	3.10
• In areas with a public hospital	10	3.62
• In areas without a public hospital	11	2.69

SOURCE: RTI International analysis of voluntary financial data submissions (specialty and NFP competitor hospitals) and IRS Form 990 Submissions (NFP competitor hospitals).

The difference in total tax exemptions for NFP competitors in areas with, and without, a public hospital is relatively small. NFP competitors in areas with a public hospital receive a larger income tax exemption, whereas NFP competitors in other areas have a higher sales tax exemption. The NFP competitor hospitals in the study in areas with a public hospital do have higher operating margins than the other NFP competitors (3.6 percent versus 2.7 percent of TOR; see Table 7-7), which produces the difference in federal income tax rates. As a result, of similar tax exemptions, differences in uncompensated care burdens continue to produce lower net benefits for NFPs in areas with a public hospitals.

7.4 Specialty Hospitals and Public Insurance Participation

Results from the previous section found that specialty hospitals provide greater community benefits than their competitor NFP hospitals. Another related question posed in the introduction was whether or not specialty hospitals also participate in public insurance programs. The potential public policy concern is that physician-owned specialty hospitals may focus on potentially more lucrative patients with private insurance and treat few patients with public insurance.

In our site visits, we found that the insurance coverage of physicians' patients was a factor in determining which patients were treated at specialty hospitals. However, rather than finding that specialty hospitals systematically shun Medicare, Medicaid and self-pay patients, we found that willingness of insurers to pay for treatment at specialty hospitals was instead the significant determinant in physician referral decisions. In particular, lack of participation with various insurance carriers was a factor in constraining referrals to specialty hospitals. Several specialty hospitals faced barriers to major private insurance carriers in their area. Specialty hospitals told us that some private insurers, particularly managed care plans, were not willing to negotiate contracts that would cover costs. Some specialty hospitals also seemed less willing or able to provide discounts in exchange for participation.

In some markets, community hospitals have entered into aggressive, exclusive contracts with major insurers. One allegedly negotiated with managed care organizations under the condition that the heart hospital not be included in their local insurance network. One heart hospital we visited did not currently have either a BC/BS or PacifiCare contract while another heart specialty hospital no longer had access to a lucrative, exclusive Kaiser heart surgery contract that was shifted to a nearby general hospital. In another market, the dominant general hospital enjoyed a long-term, exclusive BC/BS contract for 70 percent of the private market business. We found no evidence of specialty hospitals holding exclusive insurance contracts that would draw significant business from the community hospitals.

Medicare patients were treated in all the specialty hospitals we visited. All but one specialty hospital did accept Medicaid patients. Specialty hospitals also reported that they do not systematically turn away uninsured, self-pay patients; yet their physicians were generally aware when a particular patient's insurance would not cover the costs of care in the specialty hospital. It was generally understood by physicians that one general hospital in the area provided "safety net" care for the uninsured. We were told of a few cases where insured patients decided to self pay for care at the specialty hospital for quality and amenity reasons, but this clearly seems to be the exception.

To investigate the relationship between patients' insurance and referral patterns, we examined differences in the insurance mix of specialty hospitals. From Medicare claims alone, it was not possible to compare differences in insurance mix between specialty and general hospitals. Payer mix information was collected as part of the site visits in order to supplement information based on Medicare claims; our analysis is limited to these facilities. ***Table 7-8*** shows the mix for 11 specialty hospitals stratified by the three major specialty types. We found that the

Table 7-8
Insurance coverage in 11 physician-owned specialty hospitals, 2003-2004

Specialty type	Number of Hospitals	Medicare	Medicaid	Private			Self-Pay	Other Public
				Commercial	Managed Care	Total		
Cardiac	4	64%	4%	16%	13%	29%	3%	0%
Orthopedic	5	30	2	?	?	52	3	14
Surgical	2	45	4	?	?	50	2	0

SOURCE: RTI International analysis of payer mix data provided by participating physician-owned specialty hospitals during site visits in six cities.

four cardiac specialty hospitals are far more dependent on Medicare than the orthopedic hospitals. Average Medicare dependence, defined as percent of hospital revenues, is nearly two-thirds. Various forms of private insurance average about 30 percent roughly evenly split between managed care and regular commercial insurance. Medicaid and self-pay are very small contributors to cardiac specialty hospital revenues. The Medicare-private dependence relationship is nearly reversed for orthopedic specialty hospitals when workers compensation is added to private insurance. As expected, no specialty hospital had a significant percentage of Medicaid and self-pay patients. In only one specialty hospital was the sum of the two payer groups as high as 10 percent.

7.5 Conclusions

Based on the 21 hospitals in the six study cities, we find that specialty hospitals incurred a greater net community benefit burden than their not-for-profit competitors. Because of the much higher profitability of the orthopedic and surgical hospitals in this study, the higher net community benefits generated by these hospitals is due almost solely to tax payments. The cardiac hospitals in this study, on the other hand, do provide a nontrivial level of uncompensated care but are generally less profitable. It should be noted that in several cases we tried to estimate conservatively the taxes paid by the specialty hospitals in this sample. In fact, their actual tax payments, and therefore net community benefits, may be larger than is suggested in this analysis.

These results are robust to using an alternative definition of net community benefit based on tax exemptions to offset to uncompensated care costs rather than tax payments. Even recognizing the lower tax exemption benefit to NFPs because of their lower operating margins, they still bore a lower overall community burden than did specialty hospitals. Our results are generally consistent with findings in the literature showing NFP uncompensated care costs somewhat less than the value of their tax exemptions (Kane and Wubbenhorst, 2000).

We also found that a large proportion of patients in cardiac specialty hospitals have Medicare coverage. Most specialty hospitals also treat Medicaid and self-pay patients, although in smaller numbers than their competitors. Orthopedic specialty hospitals also treat patients with other forms of public insurance (e.g., worker's compensation).

SECTION 8
MARKET IMPACTS OF SPECIALTY HOSPITALS

8.1 Introduction

The rapid diffusion of physician-owned specialty hospitals has raised concerns about possible spillover economic impacts on local community hospitals. Certainly, shifts in physician practices and patients among local competitor hospitals is a common indicator of market competition. However, "cream-skimming" profitable cases by specialty hospitals, if true, suggests a flaw in normal market functioning. In this section, we explore a key link in this argument about the impacts of specialty hospitals by analyzing trends in the Medicare volumes and market shares of specialty hospitals and their local competitors during 1998–2003. The following questions are addressed here using Medicare claims aggregated across all specialty hospital markets as of 2003, supplemented by individual market analyses and case study interviews in six case study cities:

- What kinds of markets are specialty hospitals locating in (e.g., high growth, small/large), and how does market structure alter the volume impacts of specialty hospitals?

- What has been the growth in the number, size, and market shares of specialty hospitals? Do growth trends differ for surgical versus medical patients? For major/extreme cases? Are all specialty hospitals equally successful in terms of volume growth?

- How are general acute hospital volumes affected by the entry of physician–owned specialty hospitals? Are all competitor hospitals similarly affected by the spread of specialty hospitals or are "safety net" and certain competitors particularly vulnerable? How do local competitors respond to specialty hospital competition for patients?

- Would conclusions regarding spillover volume effects on local competitors differ once partnership arrangements between specialty and local hospitals are taken into consideration?

- Does the entry of specialty hospitals reduce the burden of local hospitals in caring for the severely ill in certain DRGs?

The rest of this section is divided into four parts. Section 8.2 is a discussion of the database and methods underlying the empirical research. Section 8.3 describes a "national" study of specialty markets using Medicare claims showing the diffusion of specialty hospitals and any changes in specialty and competitor volumes and market shares. Then Section 8.4 provides more detailed volume analyses in six local markets. Finally, Section 8.5 summarizes key findings. Appendix 8 provides supplemental tables including all specialty hospitals in operation as of 2004 and their volumes in 1998-2003, counts of all Medicare discharges, market share rankings of specialty hospitals in all markets as of 2003, and total Medicare volumes for specialty hospitals and each of their competitors in the six case study cities.

8.2 Sample and Methods

As described in Section 3 of this report, we first identified 92 physician-owned specialty hospitals in operation in the first six months of 2004. Next using Medicare Inpatient Prospective Payment System (IPPS) claims for the first half of 2004, each hospital was classified into one of three specialty groups—cardiac, orthopedics, or surgery—based on having at least 45 percent of its discharges in MDC 5 (cardiac) or in MDC 8 (orthopedic) or, failing these two criteria, at least 45 percent being surgical discharges (surgery). Minimum volumes of major heart (e.g., bypass) or orthopedic (e.g., hip/knee) surgery were also required to be considered a cardiac or orthopedic provider (see Section 3). Specialty hospitals that had fewer than 15 Medicare discharges were classified into a fourth group of low Medicare volume or surgery shares.

All acute care general hospitals within a 20–mile radius of a specialty hospital first were identified as "potential" competitors. Each potential competitor then was considered either a cardiac or orthopedics competitor if it had a least 15 Major Heart of 15 Major Orthopedic DRG discharges, respectively, in the first of 2004. Many tertiary general hospitals qualified as competitors in both groups. Competitors for the "residual" set of surgical specialty hospitals included all acute general hospitals within a 20-mile radius of each facility if they met the surgical volume minimum (15 cases).

To quantify "national" volume impacts of specialty hospitals as they diffuse within and across markets over time, we employed a "look back" approach. After identifying all specialty hospitals treating Medicare inpatients as of mid-2004, we narrowed the sample to those also treating patients in 2003. This subset of specialty hospitals determined the final set of "national" specialty markets to be examined in Section 8.3. Using this set of 2003 "specialty" markets, we then tracked the volumes and market shares of specialty and competitor hospitals from 1998 through 2003. Very few specialty hospitals existed in 1998. Our "look back" approach allowed us to capture both the diffusion into new markets and the increasing intensity of specialty competition within markets.

All calendar year 1998 and 2003 Medicare discharges from specialty and competitor hospitals were used in the analyses, including a small number (one-quarter of a percent) of unclassified claims, to ascertain the full market impacts of specialty hospitals. Medicare claims (discharges) were summed for each specialty and competitor hospital and year. Market shares were then calculated using only discharges from those hospitals competing in a particular market within a given specialty hospital class (e.g., cardiac).

Market shares of complex Medicare cases (classified as major/extreme in 3M's APR-DRG system, see Methods section of Section 4), were also tabulated, but only for the hospitals in the six case study sites. Analyses of case-mix complexity in Section 4 presented major/extreme rates within a DRG for specialty hospitals and their competitors. In this section, we display the market shares of severely ill, complex cases for each case study specialty and competitor hospital. Market share comparisons over time reflect changes in both the case-mix complexity within certain DRGs as well as the overall Medicare volume of a specialty hospital relative to its competitors. We are particularly interested in whether the entry of a specialty hospital in a market shifts the care (and cost) burden of complex patients away from not-for-profit providers.

To the extent this occurs, it is a positive offset to any "cream-skimming" of less costly, more profitable, cases by specialty hospitals.

The following analyses have certain limitations, which should be kept in mind when interpreting the results. First, market analyses are based only on Medicare inpatient claims. Because of their primary dependence on Medicare patients, this limitation is less an issue for cardiac hospitals than for orthopedic and surgical hospitals that focus far more on the non-elderly and ambulatory surgery. Consequently, volume impacts for orthopedic and surgical specialty hospitals are likely understated.

Second, as in MedPAC's (2005) research, and practically all other market studies found in the literature, we use geographically fixed market areas over 1998-2003. However, from case study interviews, it is likely that the entry of specialty hospitals in certain markets expands the market into outlying areas as specialty and competitor hospitals enlarge their referral network to maintain volumes. This does not necessarily imply an increase in unnecessary care if these areas were underserved in the first place, but it may explain why competitor hospitals do not experience volume reductions equivalent to the growth of specialty hospitals.[55] Burgeoning population growth within the market also buoys up inpatient demand for most providers.

Third, while we document partnership arrangements between specialty and competitor hospitals in our six market areas, we are not able to adjust for "non-competing" general acute partners in the "national" market analyses. To the extent that partnerships result in a voluntary shift in patients to specialty hospitals, negative volume impacts on true, independent competitors will be overestimated in the national analyses.

Fourth, many factors besides the entry of a specialty hospital can affect volumes and market shares of competitors. These include any changes in managed care contracting, either for particular hospitals or the market as a whole. In cities with Medicare managed care plans, the (in)ability of specialty hospitals to gain contracts can limit their growth. Unfortunately, our analyses are limited by the claims database to the Medicare fee-for-service population. Case study interviews, however, did shed some light on the broader impacts of private and public managed care penetration into different markets. Population growth and concomitant shifts in demographics and health status also can have differential effects on competitors depending upon their location and service mix. Physician groups can switch hospitals or simply move more of their patients to their own ambulatory surgery center (ASC). Expressing volumes in terms of market shares, while standardizing for overall market growth, does not account for any market realignments caused by these factors. The case study interviews, used to interpret some of the quantitative findings, should shed some light on how these factors mold specialty hospital impacts in local markets.

8.3 National Market Trends

We describe the growth of specialty hospitals over 1998–2003 in the first part of this section. We also describe their characteristics, where they are located, and their Medicare

[55] The possibility of expanding markets, geographically, also undermines attempts to analyze trends in surgical volumes per capita because of a systematic underestimate in market beneficiary counts over time.

inpatient volumes. Then we compare the levels and trends in Medicare inpatient volume of specialty hospitals and their peer competitors in the second part of this section.

8.3.1 Growth of Specialty Hospitals

The number of physician-owned specialty hospitals treating Medicare beneficiaries more than quadrupled, from 21 in 1998 to 92 in 2004 (***Table 8-1***). Three of the 21 specialty hospitals in 1998 were cardiac (heart) hospitals, 13 were orthopedic, only one was surgical, and the remaining four either had very low Medicare volumes or surgery shares and could not be classified. By 2004, there were 20 physician-owned cardiac specialty hospitals seeing Medicare patients, 43 orthopedic hospitals, 12 surgical hospitals, and 17 low volume or low surgery hospitals that generally were too new to classify.

The number of markets[56] that had at least one specialty hospital increased from 17 in 1998 to 58 in 2004. By 2004, there were 20 cardiac specialty hospitals operating in 17 markets, 43 orthopedic specialty hospitals in 32 markets, and 12 surgical specialty hospitals in 12 markets. Three markets—Indianapolis, Milwaukee, and Wichita—each had two cardiac specialty hospitals that treated Medicare beneficiaries during the first half of 2004.[57] Dallas and Oklahoma City each had six specialty hospitals of various types by 2004. Most specialty hospitals are located in the Central region of the country: South Dakota, Nebraska, Kansas, Oklahoma, Arkansas, Louisiana, and Texas (***Exhibit 8-1***).

Medicare discharges from physician-owned specialty hospitals increased almost sevenfold between1998 and 2003.[58] In 1998, the three cardiac specialty hospitals had 4,612 discharges. By 2003, the number of cardiac specialty hospitals increased sixfold and total Medicare volumes increased 8-fold. The 40 orthopedic specialty hospitals in 2003 was three times the number just five years earlier. Their aggregate volumes increased 5-fold. Although surgical specialty hospitals showed even greater relative growth, they still represent a very small number of total specialty hospital Medicare discharges (3 percent) and will not be analyzed further in this section.

8.3.2 Distribution of Medicare Discharges and Market Shares

The impact of specialty hospital diffusion on competitors' volumes and market shares was not uniform either across or within types of specialty hospitals. In this section, we present Medicare IPPS discharge statistics for 1998 and 2003 over all markets that had cardiac and orthopedic specialty hospitals by 2003.

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[56] A market for this table uses the OMB Core-Based Statistical Area (CBSA). This definition is very similar to the former Metropolitan Statistical Area but is based more on commuter patterns.

[57] The list of specialty hospitals would include any that were closed or sold after June, 2004.

[58] Appendix Table 8-A.1 shows the number of Medicare discharges (inpatient claims), each year from 1998 through 2003, for each of the 92 specialty hospitals that treated Medicare beneficiaries during the first part of 2004.

Table 8-1
Number and volumes of specialty hospitals, 1998-2004

Characteristic	1998	1999	2000	2001	2002	2003	2004
Number of Hospitals							
Total	21	31	37	45	62	84	92
Cardiac	3	8	8	9	13	18	20
Orthopedic	13	16	20	22	30	40	43
Surgery	1	2	4	6	9	12	12
Low Medicare volume or surgery share[1]	4	5	5	8	10	14	17
Medicare Claims[2]							
Total	7,064	12,776	21,436	27,181	32,809	47,656	N/A
Cardiac hospitals	4,612	9,850	17,464	21,717	25,349	37,530	N/A
Orthopedic hospitals	1,589	2,145	2,879	4,091	5,488	8,098	N/A
Surgery hospitals	62	55	216	345	1,003	1,471	N/A
Low Medicare volume or surgery share†	801	726	877	1,028	969	557	N/A
Number of CBSAs (markets)							
Total	17	23	29	36	45	56	58
Number with:							
Cardiac	3	8	8	9	12	16	17
Orthopedic	11	11	15	17	22	29	32
Surgery	1	2	4	6	9	12	12
Low Medicare volume or surgery share	3	4	4	7	9	12	14

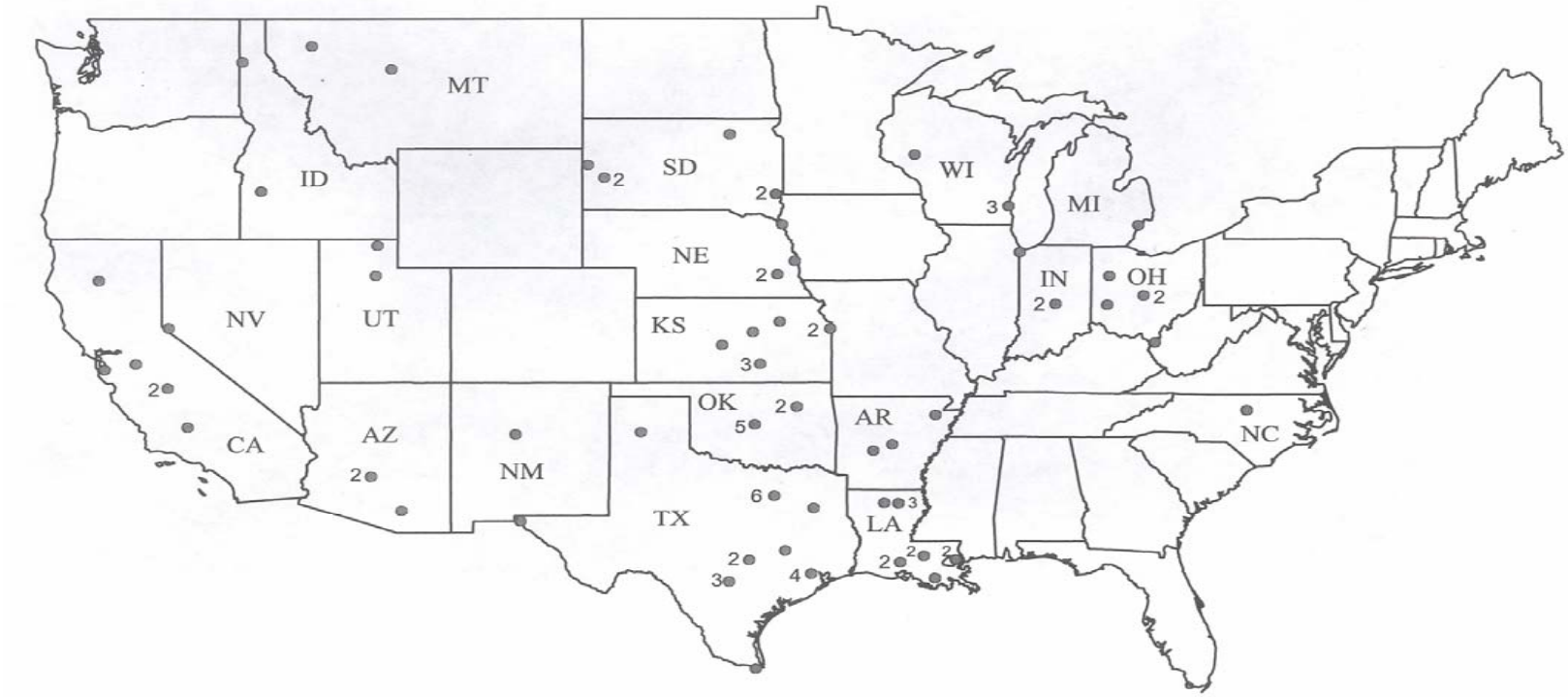
NOTES:
N/A – a full year of calendar year 2004 claims is not available.

[1]Less than 15 Medicare discharges or surgeries account for less than 45% of Medicare discharges.

[2]Counts include claims not used in the referral and other analyses. These groups of other claims, about 0.25%, were typically for claims that have DRGs not assigned to a MDC or PRE-MDC class. Also included is a small number of claims that the APR-DRG grouper was not able to process.

SOURCE: Medicare inpatient SAF claims, 1998-2003.

Exhibit 8-1
Geographic distribution of specialty hospitals in the United States



Note: Each facility is indicated by a red circle. In areas where there are multiple facilities in close proximity, the number of facilities is indicated adjacent to the symbol.

Cardiac Specialty Hospitals and Their Competitors

For both 1998 and 2003, the top half of ***Table 8-2*** shows the number of hospitals and total cardiac discharges, by specialty/competitor status, in the 16 markets that had a cardiac specialty hospital in 2003.[59] Only hospitals with a full year's data are included. The table also shows the aggregate market shares for cardiac hospitals and their competitors. In 1998, only two, full-year, cardiac specialty hospitals accounted for less than two percent of the total cardiac discharges in the 16 markets that specialty hospitals had entered by 2003. The average market share of the two cardiac specialty hospitals in 1998 was 15.6 percent (see mean share values). This was only slightly smaller than the 16.1 percent market share of the 96 full-year peer competitors in all 16 markets. By 2003, the 13 full-year cardiac hospitals accounted for 15.2 percent of total cardiac discharges in the 16 markets, and their average, unweighted, market share was 22.9 percent compared with 12.9 percent for competitors. Given their focus on surgical DRGs, it is not surprising that the heart surgery market shares of cardiac specialty hospitals were even greater (***Table 8-3***).

Table 8-2
Distribution of cardiac[1] discharges and shares of heart specialty and competitor hospitals, 1998 and 2003

	1998				2003			
	Cardiac discharges		Share of cardiac discharges		Cardiac discharges		Share of cardiac discharges	
Statistic/percentile	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals
Number of hospitals	96	2	96	2	98	13	98	13
Discharges	144,106	2,828	98.1%	1.9%	153,818	27,683	84.8%	15.2%
Average (Mean)	1,501	1,414	16.3%	15.6%	2,129	2,129	12.9%	22.9%
Maximum	6,934	1,960	84.9%	19.4%	8,417	3,599	60.4%	48.8%
75%	1,944	1,960	22.4	19.4	1,855	2,358	17.5	28.2
50% (median)	1,129	1,414	10.7	15.6	1,276	1,931	9.3	20.9
25%	711	868	5.3	11.8	850	1,618	4.9	14.5
Minimum	101	868	0.5	11.8	237	1,008	0.9	3.9

NOTE: [1]All MDC5 DRG discharges.

[2]Only hospitals operating all 12 months for the given year are included.

SOURCE: Medicare inpatient SAF claims, 1998 and 2003. run: clm57p, clm59p (5-23-05)

[59] Tables showing the same types of statistics on all Medicare discharges are in the Appendix, Tables 8-A.2 and 8-A4. Although cardiac specialty hospitals were in 17 markets in 2004, they were operational in only 16 a year earlier. Appendix tables also include hospitals not reporting a full year's worth of claims.

Table 8-3
Distribution of cardiac surgery[1] volume and shares for cardiac specialty and competitor hospitals, 1998 and 2003

	Cardiac surgery discharges, 1998				Cardiac surgery discharges, 2003			
	Total discharges		Share of discharges		Total discharges		Share of discharges	
Statistic/Percentile	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital
Number of Hospitals[2]	96	2	96	2	98	13	98	13
Discharges	62,185	1,723	97.3%	2.7%	65,561	18,953	77.6%	22.4%
Average (Mean)	648	862	16.1%	23.2%	669	1,457	11.6%	30.8%
Maximum	3,966	1,277	88.2%	28.0%	4,905	2,599	55.8%	58.1%
75%	820	1,277	23.8	28.0	866	1,565	16.7	40.8
50% (median)	413	862	9.2	23.2	474	1,311	6.7	28.2
25%	218	446	4.0	18.4	270	1,066	3.8	19.5
Minimum	12	446	0.2	18.4	43	733	0.4	7.3

NOTE: [1]MDC5 surgical DRG discharges.

[2]Only hospitals operating all 12 months for the given year are included.

SOURCE: 1998 and 2003 Medicare inpatient SAF claims. run: clm57u, clm59u (5-23-05)

While cardiac specialty hospitals, as a group, captured about three-fourths of the total increase in cardiac Medicare cases between 1998 and 2003 in the 16 markets,[60] they were not all equally successful in capturing market share. The bottom half of Table 8-2 shows the size distribution of cardiac discharges and market shares. At least one-in-four full-year specialty hospitals exceeded 2,358 discharges (see 75 percentile threshold) while another one-quarter had fewer than 1,618 discharges. Competitor cardiac hospitals show similar volume inequalities. The spread in market shares was slightly greater than in volumes reflecting an inverse relationship between hospital volumes and number of cardiac providers in the market.

By 2003, cardiac specialty hospitals had the highest cardiac volumes in 7 of the 12 markets in which cardiac hospitals had been open the entire year (Appendix ***Table 8-A.3***). A couple of specialty hospitals have become the largest cardiac provider even in cities that have a large number of competitors (e.g., Phoenix).

Focusing on cardiac *surgery*, which is of major concern to competitor hospitals (see Table 8-3), average 2003 specialty Medicare volumes greatly exceeded average competitor volumes (1,457 versus 669). Cardiac specialty hospitals captured 85 percent of the 1998-2003 overall growth in cardiac surgical volume in the 16 markets (17,230 specialty discharges versus 20,606 total market increase). Some of their growth obviously came at the expense of competitors. It should be remembered, however, that market entry by specialty hospitals is likely

[60] We cannot tell how much of the growth in specialty volume was from new cases versus taking cases away from local competitors.

increasing market size,[61] and competitors, as a whole, gained cardiac volume over the period. Nevertheless, cardiac specialty hospitals are capturing the majority of any market expansion as well as market share.

Considerable variation is observed around the 2003 average surgical market share (30.8 percent) of specialty hospitals (Table 8-3, last column). Half of the 18 specialty hospitals had market shares between 20 and 40 percent while one-quarter (roughly 4) had shares in excess of 40 percent. Changes in the market share thresholds over time imply that *entry and growth of cardiac specialty hospitals is occurring more at the expense of larger, previously dominant, competitors.* Note, in particular, declines in the market share of the largest (maximum) competitor as well as the decline in the 75 percentile threshold share. Market shares of smaller competitors appear less affected over time.

Orthopedic Specialty Hospitals and Their Competitors

In 1998, 10 full-year orthopedic specialty hospitals accounted for just 1.5 percent of Medicare orthopedic (MDC 8) discharges in the 29 markets that subsequently had one or more specialty hospitals in 2003 (***Table 8-4***). They averaged a 4.4 percent (unweighted) market share. By 2003, 32 full-year orthopedic specialty hospitals accounted for 5.7 percent of all orthopedic discharges in their 29 markets. The near quadrupling of specialty overall market share in five years is due to a high rate of diffusion into new markets (10 to 29), to multiple providers per market (32 in 29) markets by 2003),[62] and to a 60 percent increase in average Medicare volume per provider (119 to 192). The average full-year size of an orthopedic specialty hospital by 2003 (measured in terms of Medicare discharges) was still only slightly more than one-third of the average local competitor (192/532).

Differences in relative size and market shares between competitor and specialty hospitals are similar for the subset of orthopedic surgical discharges (***Table 8-5***). Orthopedic specialty hospitals have somewhat greater market share of orthopedic surgery due to a very high proportion of surgery in total discharges. In contrast to cardiac specialty hospitals, diffusion and growth in orthopedic specialty hospitals has been responsible for a modest (22 percent) proportion of overall surgical market growth (4,850 out of 22,486). No orthopedic specialty hospital's Medicare inpatient volume was ranked number one in the market while five (of 29) were second largest in their market (Appendix ***Table 8-A.5***).

The distributional thresholds in Table 8-5 suggest a more even impact of specialty hospital entry on small and large competitors compared with cardiac markets. This is evidenced by the similar relative declines in their 75th and 25th percentile thresholds as well as the continued total dominance of the largest competitor provider of orthopedic surgical discharges (i.e., 94 percent in 2003).

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[61] In at least one cardiac specialty hospital we visited, cardiologists supported a referral network throughout the State of Oklahoma and occasionally airlifted patients in rural localities to their facility. Competitors in other cities were expanding at the fringes of the market as well to reach more distant rural populations.

[62] There were actually 40 orthopedic specialty hospitals in these 29 markets; 8 with less than 12 months of Medicare claims.

Table 8-4
Distribution of orthopedic[1] discharges and shares of orthopedic specialty and competitor hospitals, 1998 and 2003

	1998				2003			
	Orthopedic discharges		Share of orthopedic discharges		Orthopedic discharges		Share of orthopedic discharges	
Statistic/percentile	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals	Competitor hospitals	Specialty hospitals
Number of hospitals[2]	180	10	180	10	189	32	189	32
Discharges	77,633	1,188	98.5%	1.5%	100,635	6,128	94.3%	5.7%
(Average) Mean	431	119	15.2%	4.4%	532	192	13.4%	10.8%
Maximum	1,587	387	100.0%	15.5%	2,471	590	95.7%	38.2%
75%	574	240	17.4	7.2	716	254	15.6	12.3
50% (median)	328	57	7.0	3.3	384	154	6.4	3.7
25%	155	23	3.2	1.0	213	70	2.7	2.0
Minimum	16	0	0.6	0.0	41	31	0.5	0.3

NOTE: [1]All MD8 DRG discharges.
[2]Only hospitals operating all 12 months for the given year are included.

SOURCE: Medicare inpatient SAF claims, 1998 and 2003. run: clm57p, clm59p (5-23-05)

Table 8-5
Distribution of orthopedic surgery[1] volume and shares for orthopedic specialty and competitor hospitals, 1998 and 2003

	Orthopedic surgery discharges, 1998				Orthopedic surgery discharges, 2003			
	Total discharges		Share of discharges		Total discharges		Share of discharges	
Statistic/Percentile	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital	Competitor hospital	Specialty hospital
Number of Hospitals[2]	180	10	180	10	189	32	189	32
Discharges	60,599	1,162	98.1%	1.9%	78,235	6,012	92.9%	7.1%
Average (Mean)	337	116	15.2%	5.3%	414	188	13.1%	12.4%
Maximum	1,291	376	100.0%	17.9%	2,100	589	93.8%	42.5%
75%	454	238	17.6	8.4	554	251	14.9	14.9
50% (median)	235	56	7.2	4.2	291	152	6.0	4.8
25%	109	26	2.9	0.6	151	70	2.4	2.5
Minimum	16	0	0.5	0.0	19	31	0.2	0.3

NOTE: [1]MDC8 orthopedic surgical DRG discharges.
[2]Only hospitals operating all 12 months for the given year are included.

SOURCE: 1998 and 2003 Medicare inpatient SAF claims. run: clm57u, clm59U (5-23-05)

8.4 Market Trends in Six Cities

8.4.1 Tucson, Arizona

The Tucson market currently has one physician-owned heart hospital (Tucson Heart Hospital, THH) and six other competitors that perform either open heart or other major cardiovascular surgery. Three other hospitals have closed their open heart service in the last few years. THH is a joint partnership with physicians, MedCath, and a local not-for-profit (NFP) health system.

The city has a rapidly growing population and high managed care penetration. University hospital downtown serves as the "safety net" provider for Medicaid and the uninsured and is the only major trauma center. Cardiac care is dominated by two large, highly competitive cardiovascular groups with admitting privileges in two or more hospitals.

Medicare cardiac (MDC 5) discharges in the Tucson market rose 14 percent over 1998-2003 (***Table 8-6***).[63] The two proprietary hospitals, Tucson Heart and Northwest, had far greater volume growth (84-86%) than the other providers. Over the period, THH increased its market share from roughly 12 to 19 percent, making it the single largest provider of Medicare inpatient cardiac services. THH's volume performance has been inconsistent, however, as inpatient volumes peaked in 2001 and then declined the following two years. "Safety net" University Medical Center enjoyed a modest 10 percent increase in cardiac volume over the 5-year period.

THH's share of the cardiac *surgery* market is even larger—over 25 percent in 2003 (Table 8-6). Again, much of the increase in surgical market share is due to reductions at Carondelet St. Mary's and Tucson Medical Center. "Safety net" University also saw a modest increase in its cardiac surgery market share.

THH's number and market share of *major/extreme cardiac surgery cases* also increased over 1998-2003 (***Table 8-7***). While the number of major/extreme cardiac discharges in the city increased about 50 percent (929 versus 643), the increase was much greater for THH, resulting in a near doubling of the THH's market share for these complex cases. The specialty heart hospital now takes a similar number of major/extreme Medicare cardiac surgical cases to the other two large heart hospitals in the city (i.e., Tucson and University Medical Centers) and considerably more than the other large cardiac proprietary hospital (Northwest). THH also experienced a significant increase in its market share of major/extreme medical cardiac cases (7 to 12 percent), although its market share of these particular cases is still one of the lowest in Tucson.

8.4.2 Dayton, Ohio

The Dayton market has one physician-owned heart hospital (Dayton Heart Hospital, DHH) and five other cardiac competitors. The hospital was formed in 1999 as a joint venture involving three groups: the largest cardiology group in the city, MedCath, and a large faith-based

[63] See Appendix Table 8-A.11 for total Medicare discharges.

Table 8-6
Trends in Medicare cardiac[1] discharges and market shares: Tucson, 1998-2003

Hospital	All cardiac discharges			All cardiac market shares (%)			Cardiac surgery[2] market shares		
	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Tucson Heart	**868**	**1,618**	**+86%**	**11.8**	**19.4**	**+7.6%**	**18.4**	**25.6**	**+7.2%**
Carondelet St. Josephs	695	801	+15	9.5	9.6	+0.1	8.7	9.8	+1.1
Carondelet St. Marys	1,647	1,017	-38	22.5	12.2	-10.3	17.4	6.4	-11.0
El Dorado	445	561	+26	6.1	6.7	+0.6	4.6	4.6	0.0
Northwest M.C.	815	1,497	+84	11.1	17.9	+6.8	9.2	15.1	+5.9
Tucson M.C.	1,704	1,585	-7	23.2	19.0	-4.2	24.5	20.1	-4.4
University M.C.	1,160	1,279	+10	15.8	15.3	-0.5	17.2	18.4	+1.2
Total	7,334	8,358	+14	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC5 discharges.
[2]MDC5 surgical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

Table 8-7
Trends in Medicare cardiac major/extreme market shares: Tucson, 1998-2003

Hospital	Cardiac major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
	1998	2003	Absolute change	1998	2003	Absolute change
Tucson Heart	**11%**	**20%**	**+9%**	**7%**	**12%**	**+5%**
Carondelet St. Josephs	9	10	+1	10	12	+2
Carondelet St. Marys	23	10	-13	24	14	-14
El Dorado	3	5	+2	7	7	0
Northwest M.C.	12	13	+1	15	18	+3
Tucson M.C.	22	20	-2	19	17	-2
University M.C.	19	22	+3	19	19	0
Total	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]MDC5 surgical DRG discharges.
[2]MDC5 medical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

general hospital (St. Elizabeth's). The general hospital partner closed shortly after DHH was operational and transferred its cardiac service to DHH. The closest competitor, Miami Valley, supports the city's largest emergency department and has the only Level I trauma center. The founding DHH cardiology group previously concentrated its practice at Good Samaritan and Miami Valley, and managers in these two competitors felt they were most affected by the opening of DHH.

The Dayton market, unlike most specialty hospital markets, has not experienced population growth in the recent past. Its manufacturing industry has been depressed. Open heart services have also been established in cities that ring the larger Dayton market. Consequently, the underlying level of hospital competition for a relatively fixed population was intensifying even before the entry of Dayton Heart Hospital.

Medicare cardiac (MDC 5) discharges in the Dayton market rose 14 percent over 1998-2003 (***Table 8-8***).[64] This rate is misleading, though, because of the closure and reallocation of St. Elizabeth's patients in 2000. Actual net growth in Dayton including St. Elizabeth in 1998 is likely only a few percent. A majority of St. Elizabeth's cases naturally went to DHH under the initial partnership agreement. In 1998, before DHH opened, Good Samaritan and Miami Valley dominated the cardiac market with Kettering having a slightly smaller market share. In 2003, DHH discharged 1,800 Medicare cardiac inpatients, a number greater than the overall increase in market size (approximately 1,350). Assuming a relatively unchanged market for cardiac surgery in Dayton over the period, the discrepancy is likely due to a combination of St. Elizabeth's patients adding to DHH's volumes and a net decline in cardiac volumes among other competitors. Over the period, DHH increased its market share from zero to 17 percent, making it the fourth largest provider of Medicare inpatient cardiac services behind the original three dominant providers. All five competitors lost market share to DHH—especially Good Samaritan and Miami Valley, the area's "safety net" provider, which also lost significant cardiac volume on an absolute basis. Kettering actually increased its cardiac volume by 10 percent.

DHH's share of the cardiac *surgery* market is even larger—nearly 25 percent in 2003 (Table 8-8). Again, all five competitors lost market share for Medicare cardiac surgical patients—especially Good Samaritan.

The market share of *major/extreme cardiac surgery cases* at DHH went from zero to 30 percent over 1998-2003 (***Table 8-9***). All six providers together experienced nearly a one-third increase in the number of major/extreme discharges (not shown in Table 8-9). DHH's market share was by far the largest in the city as of 2003 and accounted for more major/extreme cases (405) than the overall growth in these cases market-wide. As a result the other five competitors experienced a net decline in major/extreme cases of 33. Declines in major/extreme cases at Good Samaritan corresponded to a major decline in the provider's share of surgical patients as well. DHH's 2003 share of *major/extreme cardiac medical cases* was only half its share of similar surgical cases. Nevertheless, DHH "absorbed" over 40 percent of the 1998-2003 increase in complex cases in Dayton, resulting in market share declines for the three other dominant competitors.

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64 See Appendix Table 8-A.6 for total Medicare discharges.

Table 8-8
Trends in Medicare cardiac[1] discharges and market shares: Dayton, 1998-2003

	All cardiac discharges			All cardiac market shares (%)			Cardiac surgery[2] market shares		
Hospital	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Dayton Heart	**0**	**1,800**	**N/A**	**0.0%**	**16.9%**	**+16.9%**	**0.0%**	**24.7%**	**+24.7%**
Good Samaritan	2,588	2,240	-13	27.7	21.0	-6.7	32.2	20.4	-11.8
Grandview	1,350	1,281	-5	14.5	12.0	-2.5	12.8	8.9	-3.9
Kettering	2,003	2,201	+10	21.5	20.6	-0.9	26.5	24.4	-2.1
Miami Valley	2,410	2,127	-12	25.8	19.9	-5.9	53.7	19.1	-4.6
Middletown	987	1,031	5	10.6	9.7	-0.9	4.9	2.7	-2.2
Total	9,338	10,680	+14	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC5 discharges.
[2]MDC5 surgical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims.

Table 8-9
Trends in Medicare cardiac major/extreme market shares: Dayton, 1998-2003

	Cardiac major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
Hospital	1998	2003	Absolute change	1998	2003	Absolute change
Dayton Heart	**0%**	**30%**	**+30%**	**0%**	**15%**	**+15%**
Good Samaritan	37	17	-20	24	17	-7
Grandview	11	11	0	17	16	-1
Kettering	26	21	-5	21	18	-3
Miami Valley	20	19	-1	24	21	-3
Middletown	5	1	-4	13	14	+1
Total	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]MDC5 surgical DRG discharges.
[2]MDC5 medical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims.

8.4.3 Fresno, California

The Fresno market has two physician-owned specialty hospitals. Fresno Heart Hospital (FHH) is a partnership between physicians and the Community Medical Corporation (CMC), a NFP entity that also owns and operates two large general acute hospitals in the market. Because FHH only began admitting patients in late 2003, we are not able to analyze its impact on heart volumes and market shares of its competitors for this report.

Fresno Surgery Center (FSC), the other local specialty hospital, is a 20-bed facility concentrating in elective orthopedic surgery. FSC began in 1984 as an ASC and added a few inpatient beds a few years later. It is one of the oldest specialty hospitals in the country. It is wholly owned either by physicians or a few other individuals, although many original owners have retired and their ownership is now held in trust. FSC competes with CMC's Fresno Community facility and with St. Agnes some miles away. FSC also competes with at least 15 ASCs in the market, some of which were started by physician groups originally based at FSC. CMC-Fresno serves the downtown area as a "safety net" facility with significant numbers of Medicaid and uninsured patients. It is also operates the city's trauma center. Kaiser also has a large hospital in the market that contracts with FSC for "spillover" general surgery on an as-needed basis. (Kaiser volume does not appear in the Medicare fee-for-service claims and is excluded from the market share tables below. Its spillover volumes are included in FSC volumes.)

Fresno is a growing market serving central California's agricultural region. The population has an above-average proportion of uninsured and a high prevalence of pulmonary, heart, diabetes, and other comorbid conditions. Kaiser's presence represents significant managed care pressure on inpatient hospital utilization.

While the Fresno inpatient market for Medicare orthopedic (MDC 8) patients grew 31 percent over 1998-2003, FSC's volume was essentially flat (***Table 8-10***).[65] This resulted in a substantial decline in its market share for both surgical and medical orthopedic cases. These trends understate FSC's inpatient volume problems as *total* Medicare discharges declined 18 percent over the period, in part, due to the retirement of a high volume bariatric surgeon (Table 8-A.7). FSC's two major competitors, CMC and St. Agnes, experienced substantial increases in their orthopedics volumes, both overall and for surgical cases. All of the area's volume increase went to these two competitors (ignoring any volume gains by Kaiser due to a lack of Medicare claims).

In spite of flat orthopedic volumes, FSC saw a tripling in its number of *major/extreme orthopedic surgical admissions* that resulted in a slight increase in its market share of these complex patients (***Table 8-11***). St. Agnes continued to treat well over a majority of these complex orthopedic patients locally.

[65] See Appendix Table 8-A.7 for total Medicare discharges.

Table 8-10
Trends in Medicare orthopedic[1] discharges and market shares, Fresno: 1998-2003

Hospital	All orthopedic discharges			All orthopedic market shares (%)			Orthopedic surgery[2]		
	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Fresno Surgery Center	**285**	**283**	**-1%**	**15.5%**	**11.8%**	**-3.7%**	**17.9%**	**14.1%**	**-3.8%**
CMC-Clovis	137	245	+79	7.5	10.2	+2.7	7.9	10.5	+2.6
CMC-Fresno	390	534	+37	21.3	22.2	+0.9	20.4	21.3	+0.9
Madera	97	69	-29	5.3	2.9	-2.4	5.1	4.5	-0.6
St. Agnes	924	1,276	+38	50.4	53.0	+2.6	48.7	51.5	+2.8
Total	1,833	2,407	+31	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC5 discharges

[2]MDC5 surgical DRG discharges

Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

Table 8-11
Trends in Medicare orthopedic major/extreme[1] market shares, Fresno: 1998-2003

Hospital	Orthopedic major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
	1998	2003	Absolute change	1998	2003	Absolute change
Fresno Surgery Center	**3%**	**5%**	**+2%**	**0%**	**0%**	**0%**
CMC-Clovis	5	11	+6	0	8	+8
CMC-Fresno	24	23	-1	35	28	-7
Madera	5	3	-2	4	3	-1
St. Agnes	63	58	-5	61	61	0
Total	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC8 discharges

[2]MDC8 surgical DRG discharges

Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

8.4.4 Hot Springs, Arkansas

The Hot Springs market has one totally physician-owned orthopedic specialty hospital (HealthPark) and two major (and two minor) competitors. St. Joseph's, the dominant non-profit faith-based provider, is a tertiary facility located less than a mile from HealthPark and provides trauma support for the city. St. Joseph's also has an exclusive contract with Blue Cross-Blue Shield that covers 70 percent of all privately insured patients in the city. For-profit National Park is roughly half the size of St. Joseph's and operates in another section of Hot Springs.

Two large, highly competitive, multi-specialty physician groups provide inpatient care and emergency room coverage. The HealthPark physician group, including five (of seven) orthopedic surgeons in Hot Springs, see patients in both St. Joseph's and National Park, but their impact has been far greater on the for-profit National Park in Hot Springs, both in terms of volume and staff recruitment. The exclusive Blue Cross-Blue Shield (BC/BS) contract with St. Josephs has constrained the ability of HealthPark physicians to refer profitable private patients to their own facility. Also taking ER call in both competitor hospitals further limits referrals. (HealthPark operates a minimal, one-bed ER.)

Hot Springs is a fast-growing resort and retirement location for the elderly and was recently designated an MSA. Nevertheless, physician turnover in the city is high and recruitment of outside practitioners difficult.

Medicare orthopedic discharges increased nearly 50 percent over 1998-2003 in the Hot Springs market (***Table 8-12***).[66] HealthPark specialty hospital captured two-thirds of this increase over the period and enjoyed a 21 percent orthopedic market share by 2003. Its share of the orthopedic surgery market was slightly higher. For-profit National Park appears to have suffered the most from the growth in HealthPark and was also negatively impacted by St. Joseph's exclusive BC/BS contract. Its absolute volume of orthopedic patients was down slightly over the period, resulting in 10 percentage point losses in market share. By 2003, National Park's share of Medicare orthopedic surgical patients was considerably less than that of HealthPark. By contrast, St. Joseph's substantially increased its orthopedics volume, although it, too, lost significant market share to HealthPark. "Safety net" Hot Springs County, while having the local indigent care contract, never had many orthopedic patients. Both National Park and St. Josephs see significant numbers of Medicaid and uninsured patients.

The entry of HealthPark in the market has also resulted in a shift in responsibility for Medicare *major/extreme orthopedic patients* primarily from National Park to the new specialty hospital (***Table 8-13***). The NFP St. Joseph's, however, continues to be the leading provider of orthopedic care to this complex group of patients.

8.4.5 Oklahoma City, Oklahoma

The highly competitive Oklahoma City market has six physician-owned specialty hospitals (not counting two women's hospitals with physician ownership). Physician-owned Oklahoma Heart Hospital (OHH) began admitting patients in late 2002; yet one year later OHH

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[66] See Appendix Table 8-A.8 for total Medicare discharges.

Table 8-12
Trends in Medicare orthopedic[1] discharges and market shares: Hot Springs, 1998-2003

	All orthopedic discharges			All orthopedic market shares (%)			Orthopedic surgery[2]		
Hospital	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Healthpark	**0**	**294**	**NA %**	**0%**	**20.9%**	**+20.9%**	**0%**	**24.5%**	**+24.5%**
Baptist	63	76	+21	6.5	5.4	-1.1	5.3	3.3	-2.0
National Park	268	247	-8	27.8	17.5	-10.3	28.3	17.5	-10.8
St. Joseph's	597	754	+26	62.0	53.6	-8.4	65.9	54.8	-11.1
Hot Springs County	35	37	+2	3.6	2.6	-1.0	0.4	0.0	-0.4
Total	963	1,408	+46	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC8 discharges.
[2]MDC8 surgical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm60, clm61 (3-17-05)

Table 8-13
Trends in Medicare orthopedic major/extreme market shares: Hot Springs, 1998-2003

	Orthopedic major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
Hospital	1998	2003	Absolute change	1998	2003	Absolute change
Healthpark	**0%**	**21%**	**+21%**	**0%**	**5%**	**+5%**
Baptist	2	5	+3	4	9	+5
National Park	46	21	-25	46	20	-26
St. Joseph's	51	53	+2	46	63	+17
Hot Springs County	1	0	-1	4	3	-1
Total	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]MDC8 surgical DRG discharges.
[2]MDC8 medical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm60, clm61 (3-17-05)

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was the largest physician-owned heart hospital in the country in terms of Medicare discharges (see Appendix A-8.1). OHH is a joint partnership with general acute Mercy Hospital, which is connected with OHH by an underground tunnel. Mercy closed its open heart service once OHH was operational. OHH has four major cardiac competitors if the two Integris hospitals are considered as one organizational entity and partner Mercy is excluded.

The city has a rapidly growing population with very few heart hospitals in the rest of the state. Oklahoma University Medical Center, which is managed by the for-profit Hospital Corporation of America (HCA) for the State of Oklahoma, is the local safety net provider treating disproportionate numbers of Medicaid and uninsured patients. Its also operates the only Level I trauma center in the state.

The city has five physician-owned orthopedic specialty hospitals that sub-specialize to varying degrees in back versus hip/knee surgery. Although Physician's Hospital is classified as an orthopedic specialty hospital, it has a far lower share of MDC 8 cases than the other hospitals in its class.[67] The orthopedic specialty hospitals are all relatively small (less than 20 beds) and compete with the other major general acute hospitals, as well as the 16 ASCs in the city. The Oklahoma Center for Orthopedic & Multi-Specialty Surgery, a large NFP orthopedic surgery hospital, is a joint partnership with Integris Southwest Medical Center.

Cardiac Services. Medicare cardiac (MDC 5) discharges in Oklahoma City rose 40 percent over 1998-2003 (***Table 8-14***).[68] The entry of the specialty heart hospital accounts for three-quarters of the increase (3,538 of the 4,631 (=16,286 – 11,655) additional cases in the city) and within one year displaced Integris Baptist as the largest Medicare heart facility in the city. The combined share of OHH and Mercy accounted for two-thirds of the city's Medicare volume increase. OHH in 2003 accounted for slightly over one-fifth (22 percent) of local cardiac market and fully one-third of the cardiac surgical market. Cardiac volumes increased in four other local providers while "safety net" OU Medical Center lost over 50 percent of its 1998 cardiac inpatient volume resulting in precipitous declines in its overall and surgical market share of cardiac patients. Before cardiologist physician owners formed OHH, they were located primarily at Presbyterian Hospital (now part of OU Medical Center). According to OHH cardiologists, when partnering discussions with Presbyterian managers about partnering on a specialty heart hospital were discontinued by HCA, they sought out Mercy Hospital as an alternative local partner. The cardiologist group reported to us that they also rejected MedCath as a partner in preference to a local provider. Integris Baptist's flat cardiac volume over the period also resulted in substantial loss in cardiac market share.

By 2003, OHH accounted for 27 percent of all *surgical major/extreme Medicare cardiac cases* in the city, a rate somewhat below (33 percent) its share of all surgical cases (***Table 8-15***). It exhibits a far lower share of cardiac medical cases (10 percent), although the combined OHH-Mercy share of these cases rose from 11 to 18 percent over the period. Only Integris Baptist had a larger share of major/extreme cardiac cases (22 percent). "Safety net" OU Medical Center

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[67] It also has a 10-bed ICU that is currently unstaffed.

[68] See Appendix Table 8-A.9 for total Medicare discharges.

Table 8-14
Trends in Medicare cardiac[1] discharges and market shares: Oklahoma City, 1998-2003

	All cardiac discharges			All cardiac market shares (%)			Cardiac surgery[2] market shares		
Hospital	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Oklahoma Heart	**0**	**3,538**	**NA%**	**0.0%**	**21.7%**	**+21.7%**	**0.0%**	**33.3%**	**+33.3%**
Mercy	1,258	851	-32	10.8	5.2	5.6	12.5	2.4	-10.1
Integris Baptist	3,065	3,097	+1	26.3	19.0	-7.3	29.0	20.2	-8.8
Integris Southwest	1,115	1,675	+50	9.6	10.3	+0.7	6.2	5.2	-1.0
Deaconess	1,002	1,061	+6	8.6	6.5	-2.1	6.0	4.2	-1.8
Midwest City	1,472	2,532	+72	12.6	15.5	-2.9	8.6	11.9	+3.3
OU Medical Center	2,222	1,027	-54	19.1	6.3	-12.8	23.7	5.0	-18.7
St. Anthony	1,521	2,505	+65	13.1	15.4	+2.3	14.1	17.7	+3.6
Total	11,655	16,286	+40	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC5 discharges.
[2]MDC5 surgical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

Table 8-15
Trends in Medicare cardiac major/extreme market shares: Oklahoma City, 1998-2003

	Cardiac major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
Hospital	1998	2003	Absolute change	1998	2003	Absolute change
Oklahoma Heart	**0%**	**27%**	**+27%**	**0**	**10%**	**+10%**
Mercy	12	4	-8	11	8	-3
Integris Baptist	27	24	-3	23	22	-1
Integris Southwest	4	6	+2	10	13	+3
Deaconess	7	6	-1	11	7	-4
Midwest City	8	12	+4	15	9	-6
OU Medical Center	28	6	-22	18	11	-7
St. Anthony	14	16	+2	13	7	-6
Total	100	100	N/A	100	100	N/A

NOTE: [1]MDC5 surgical DRG discharges.
[2]MDC5 medical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

experienced significant declines in its market share of these complex patients (as well as a decline in the share of these patients in their own surgical and medical admissions).

Orthopedic Services. Between 1998 and 2003, the addition of four new physician-owned specialty hospitals added 534 (559-25) MDC 8 Medicare discharges to the city's inpatient volume (***Table 8-16***).[69] This increase accounted for roughly 30 percent (534 out of 1,836) of the overall growth in Medicare orthopedic inpatient volume. The five specialty hospitals combined captured 8 percent of the Oklahoma City Medicare orthopedic inpatient market and over 9 percent of the orthopedic surgical market. While the influx of specialty hospitals made significant inroads into the market, it was the not-for-profit Bone & Joint Hospital (part of the St. Anthony network) that had the largest increase in both volume and market share. Possibly because of the success of the Bone & Joint facility, several of its surgical staff in 2005 opened their own orthopedic specialty hospital with an investment stake. Ignoring St. Anthony's, which partners with the Bone & Joint Hospital, only the OU Medical Center experienced a decline in Medicare orthopedic volume, although several others did lose market share. Second-largest Integris Baptist Hospital increased its Medicare orthopedics volume by 15 percent over 1998-2003; yet still lost some market share. Its share, however, still exceeds the combined inpatient shares of the other specialty hospitals.

The Bone & Joint Hospital is responsible for treating over one-in-four Medicare surgical *orthopedics patients classified as major/extreme* (***Table 8-17***). The rest of these complex surgical patients are distributed widely among other local general hospitals with the notable exception of the specialty hospitals. Although these five specialty hospitals had 8 percent of the MDC 8 surgical market, they saw only 2 percent of the major/extreme surgical patients and none of the complex medical patients. While the Bone & Joint Hospital also was similarly oriented towards orthopedics surgery, its shares of major/extreme surgical cases were notably greater than the physician-owned specialty hospitals.

8.4.6 Rapid City, South Dakota

The Rapid City, South Dakota, market has two physician-owned specialty hospitals. The very small Same Day Surgery Center is a joint physician-hospital partnership with the only general acute local hospital, Rapid City Regional Hospital. Black Hills Surgery Center is an independent specialty hospital with 24 beds and a concentration in orthopedic and neurosurgery. Same Day was opened as a 6-bed unit in response to Black Hills and does a variety of surgical cases (occasionally requiring an overnight stay). Most physician-owners continue to admit patients to Rapid City Regional Hospital.

The Rapid City market is largely rural outside a small city core, and all three facilities draw patients from well outside the 20-mile radius we used to define a local market. The area population is growing and has almost no managed care presence.

[69] See Appendix Table 8-A.10 for total Medicare discharges.

Table 8-16
Trends in Medicare orthopedic[1] discharges and market shares: Oklahoma City, 1998-2003

	All orthopedic discharges			All orthopedic market shares (%)			Orthopedic surgery[2] market shares		
Hospital	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Northwest	**25**	**85**	**+240%**	**1.0%**	**1.2%**	**+0.2%**	**1.0%**	**1.5%**	**+0.5%**
OK Center for Orthopedics	**0**	**110**	**N/A**	**0**	**1.6**	**+1.6**	**0**	**2.0**	**+2.0**
Oklahoma Spine	**0**	**199**	**N/A**	**0**	**2.9**	**+2.9**	**0**	**3.6**	**+3.6**
Physicians Hospital	**0**	**115**	**N/A**	**0**	**1.7**	**+1.7**	**0**	**1.4**	**+1.4**
Surgical Hospital	**0**	**50**	**N/A**	**0**	**0.7**	**+0.7**	**0**	**0.9**	**+0.9**
Total (Specialty Hospitals)	**25**	**559**	**--**	**1.0**	**8.1**	**+7.1**	**1.0**	**9.4**	**+8.4**
Bone & Joint	1,207	1,846	+53	24.2	27.0	+2.8	28.8	31.7	+2.9
St. Anthony	292	189	-35	5.8	2.8	-3.0	5.3	2.2	-3.1
Deaconess	336	467	+39	6.7	6.8	+0.1	5.9	6.4	+0.5
Edmond	130	114	-12	2.6	1.7	-0.9	2.4	1.2	-1.2
Integris Baptist	674	774	+15	13.5	11.3	-2.2	12.8	11.5	-1.3
Integris Southwest	389	461	+19	7.8	6.7	-1.1	7.2	5.8	-1.4
Mercy	580	862	+49	11.6	12.6	+1.0	10.3	11.1	+0.8
Midwest	429	572	+33	8.6	8.4	-0.2	7.7	7.1	-0.6
Norman	549	605	+10	11.0	8.9	-2.1	11.0	8.4	-2.6
OU Medical Center	386	384	-1	7.7	5.6	-2.1	7.9	5.4	-2.5
Total (all hospitals)	4,997	6,833	+37	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]MDC8 surgical DRG discharges.
[2]MDC8 medical DRG discharges
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims.

Table 8-17
Trends in Medicare orthopedic[1] major/extreme market shares: Oklahoma City, 1998-2003

	Orthopedic major/extreme					
	Surgery[1] Market Shares (%)			Medical[2] Market Shares (%)		
Hospital	1998	2003	Absolute change	1998	2003	Absolute change
Northwest	**0%**	**1%**	**+1%**	**0%**	**0%**	**0%**
OK Center for Orthopedics	**0**	**0**	**0**	**0**	**0**	**0**
Oklahoma Spine	**0**	**0**	**0**	**0**	**0**	**0**
Physicians Hospital	**0**	**1**	**+1**	**0**	**0**	**0**
Surgical Hospital	**0**	**0**	**0**	**0**	**0**	**0**
Total (Specialty Hospitals)	**0**	**2**	**+2**	**0**	**0**	**0**
Bone & Joint	31	27	-4	5	3	-2
St. Anthony	4	3	-1	8	4	-4
Deaconess	7	9	+2	11	14	+3
Edmond	3	2	-1	5	4	-1
Integris Baptist	13	17	+4	18	12	-6
Integris Southwest	10	10	0	8	12	+4
Mercy	8	12	+4	17	20	+3
Midwest	6	7	+1	11	11	0
Norman	6	8	+2	8	15	+7
OU Medical Center	11	4	-6	12	5	-7
Total	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]MDC8 surgical DRG discharges.
[2]MDC8 medical DRG discharges.
N/A = not applicable. Specialty hospital bolded.

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05)

The Medicare orthopedic and surgical market grew 37 percent over 1998-2003 (***Table 8-18***),[70] with Black Hills specialty hospital more than quintupling its inpatient discharges and gaining substantial market share—mostly at the expense of the regional hospital. Orthopedic (MDC 8) volumes at Rapid City Regional did increase 6 percent, and its total and orthopedic surgical volumes also increased modestly. A more detailed analysis (not shown) of volume changes with surgical orthopedics shows that Black Hills experienced an increase of 140 DRG 209 Hip/Knee discharges while Regional Hospital had an increase of 65. Black Hills' fusion surgery volume increased by 140 while Rapid City Regional's fusion surgery volume increased by 26. It appears that at least in terms of total Medicare volumes, Black Hills is gaining a disproportionate share of new surgical volumes in the market but not actually reducing volume in the tertiary general acute hospital competitor. Black Hills does appear to have gained DRG 499/500 volume (Back & Neck procedures) at the expense of Rapid City Regional (+36 versus -27 cases).

[70] See Appendix Table 8-A.11 for total Medicare discharges.

The joint partnership with Rapid City Regional and its physicians in the Same Day Surgery Center has been far less successful, at least in terms of Medicare orthopedic inpatients. Again, a more detailed analysis shows that the Same Day Surgery Center almost completely eliminated its inpatient orthopedics surgery while slightly increasing its general surgery volumes. Because Black Hills never was performing the kinds of orthopedics surgery done at Same Day, these patients must have returned to Rapid City Regional Hospital.

Black Hills' share of Medicare's *major/extreme orthopedic surgical patients* increased from zero to 17 percent over the period (***Table 8-19***). This rate was slightly less than one-half of its share of surgical patients. Consequently, the NFP Rapid City Regional Hospital still saw over four-fifths of these complex patients in 2003, and over one-in-four of its orthopedic patients were major/extreme compared to only 9 percent in Black Hills. (Rapid City Regional Hospital's specialty partner saw no complex patients in 2003.)

8.5 Conclusions

Key findings are presented below organized by the market impact questions raised at the beginning of this section.

- *What has been the growth in the number, size, and market shares of specialty hospitals? Do growth trends differ for surgical versus medical patients? For major/extreme cases? Are all specialty hospitals equally successful in terms of volume growth?*

All three types of specialty hospitals have exhibited rapid diffusion into new markets and substantial Medicare inpatient growth per provider between 1998 and 2003. Cardiac specialty hospitals have been particularly successful as a group by capturing 84 percent of the cardiac surgical volume growth in the markets they entered through 2003, in large part through a substantial increase in market penetration. Their impact on markets, at least in terms of simple counts of Medicare discharges, far exceeds that of orthopedic specialty hospitals because they are over seven times larger on average. Many orthopedic specialty hospitals are strongly focused on ambulatory surgery with relatively modest Medicare caseloads.

Prior to the moratorium, all three types of specialty markets were highly dynamic. For example, as of 2003, eight cardiac hospitals had recently begun operations and two were still growing rapidly. Another eight facilities after 3-4 years appeared to have reached a mature growth stage with unchanging volumes, suggesting natural market barriers to becoming dominant providers.

As cardiac specialty hospitals enter and gain volume and market share, they take on an increasing percentage of the market's major/extreme complex cases in the market. Nevertheless, their share of these costly patients remains somewhat below their overall market share. Orthopedic specialty hospitals, with a few notable exceptions discussed later, take up much smaller shares of major/extreme cases in their markets—particularly for medical cases. The evidence also warns against treating all orthopedic specialty hospitals as a single group. Three sub-types surfaced from the case studies depending upon their surgical procedure concentration: (1) spine, (2) hip/knee, and (3) hip/knee with significant other general surgery. As a rough rule, based on seven case study specialty hospitals, the more concentrated the specialty hospital in a

Table 8-18
Trends in Medicare orthopedic[1] discharges and market shares, Rapid City: 1998-2003

	All orthopedic discharges			All orthopedic market shares (%)			Orthopedic surgery[2]		
Hospital	1998	2003	% Change	1998	2003	Absolute Change	1998	2003	Absolute Change
Black Hills	68	386	+468%	7.6%	31.7%	+24.1%	9.5%	37.0%	+27.5%
Same Day	36	3	-92	4.0	0.2	-3.8	5.0	0.3	-4.7
Rapid City Regional	785	828	+6	88.3	68.0	-20.3	85.4	62.8	-22.6
Total	889	1,217	+37	100.0	100.0	N/A	100.0	100.0	N/A

NOTE: [1]All MDC5 discharges
[2]MDC5 surgical DRG discharges

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05), clm60, clm62 (3-17-05).

Table 8-19
Trends in Medicare orthopedic major/extreme[1] market shares, Rapid City: 1998-2003

	Orthopedic major/extreme					
	Surgery[1]			Medical[2]		
	Market Shares (%)			Market Shares (%)		
Hospital	1998	2003	Absolute change	1998	2003	Absolute change
Black Hills	0%	17%	+17%	0%	0%	0%
Same Day	1	0	-1	0	0	0
Rapid City Regional	99	83	-16	100	100	0
Total	100	100	N/A	100	100	0

NOTE: 1All MDC8 discharges
2MDC8 surgical DRG discharges

SOURCE: 1998 and 2003 Medicare IPPS claims. run: clm68, clm69 (3-16-05), clm60, clm62 (3-17-05).

particular line of orthopedic surgery, the more profitable it is and the lower its percentage of major/extreme Medicare cases.

- *To what extent are competitor acute general hospitals affected by the entry of specialty hospitals in their markets? Are certain competitors especially vulnerable and how do they respond to the competitive challenge?*

The fact that cardiac specialty hospitals accounted for 85 percent of surgical market growth in markets they entered between 1998 and 2003 implies little growth left over for their competitors. What we do not know from our preliminary market analyses is how much their entry simply expanded the entire market geographically. Anecdotal evidence from the case studies suggests this was a key factor in cardiac specialty growth in at least one site. The fact that specialty hospitals tend to enter faster growing markets also mitigates the spillover impacts on competitors. It also appears that larger cardiac competitors were most affected by specialty hospital entry, possibly because they were more dependent on inpatient surgical demand.

In one market (Oklahoma City), the safety net provider directly lost significant cardiac volume to the cardiac specialty hospital after its for-profit management entity rejected a partnership arrangement with its large cardiology group. In a second site (Fresno), the safety net provider entered a partnership arrangement with its cardiology group but continues to offer major heart surgery at both sites. The safety net provider was not affected at all in a third market (Tucson), while in the fourth (Dayton), the two major competitors lost both volume and market share.

As large, tertiary providers, most cardiac competitors have considerable resources at their disposal and have vigorously responded to the presence of a specialty competitor. For example, they have negotiated aggressive discounts with managed care plans to maintain, or even capture, market share from the specialty hospital and/or its other local partner. In another city, a competitor inserted a term in its Blue Cross contract that reduced its price discounts to the insurer if Blue Cross added another heart provider to its local network. Only the new specialty heart hospital was missing from Blue Cross' existing network at the time. One or two case study competitors have also made major investments in new heart centers on their campus or negotiated favorable management contracts with their own cardiology staff.

The relatively small size of most orthopedic specialty hospitals, coupled with stronger overall market growth for orthopedic procedures, has limited the spillover volume impacts on local competitors. For example, even with five orthopedic hospitals entering the Oklahoma City market over the last few years, they accounted for only 30 percent of the overall market growth—at least for inpatient Medicare orthopedic surgery. This no doubt understates competitors' lost of more profitable surgical cases, however. Still, in the 29 markets with orthopedic specialty hospitals by 2003, competitors saw nearly a 30 percent growth in their overall Medicare orthopedic surgical volume (compared with a five percent growth for cardiac competitors).

In Oklahoma City, the major safety net provider experienced a minor loss of orthopedic surgical volumes. None of the other safety net hospitals in the case studies lost orthopedic

surgical volume, although the single tertiary competitor in Rapid City lost substantial market share to its specialty competitor.

- *What effect do partnership arrangements between acute general hospitals and their specialty hospital have on the spillover volume impacts on competitors?*

In our "national" market analyses, we were not able to adjust for competitors that had partnership arrangements with specialty hospitals. It is reasonable to expect shifts in services between them that might overstate competitor volume declines if the general hospital partner is treated as an independent competitor. Three of four cardiac specialty hospitals we visited had a local general hospital partner. Two also had MedCath as a majority partner. Tucson Heart Hospital, besides MedCath, had a non-profit local health system partner. Fresno and Oklahoma Heart Hospitals had one local acute hospital as a majority partner.

In the three instances where a local acute hospital was in partnership with a cardiac specialty hospital, two closed their open heart facility and shifted most cardiac surgery cases to their new partner. One general acute hospital network actually continued to operate dual open heart facilities in quasi-competition with each other, in part because they served different parts of the city. Shifts in cardiac surgery to the specialty hospital resulted in significant declines in volumes in the instances where the partner closed its open heart service. Nonetheless, the net effect on local competitor volumes was quite minor because (a) the local partner was only one of several large competitors prior to the entry of the specialty hospital, and (b) the local partner retained a significant portion of its minor surgery and medical cases. In the case of the Oklahoma Heart Hospital, burgeoning volume may even have had a positive spillover volume effect on its local partner as patients are referred in to the system for either surgery or medical treatment. Because very few orthopedic specialty hospitals have local hospital partners, and because they have much smaller inpatient censuses, any volume bias from ignoring partnership arrangements is minimal.

- *What kinds of markets do specialty hospitals tend to locate in and how does market structure affect their spillover volume impacts on competitors?*

Nearly all cardiac and orthopedic specialty hospitals locate in faster growing markets without state Certificate of Need (CON) regulations (GAO, 2003). Population growth attenuates the volume lost associated with their entry, but it also attracts investors to the market. Lack of CON barriers to entry and service expansion, while desirable for established providers wishing to expand services, also has the downside of facilitating entry of new competitors.

Cardiac specialty hospitals are found primarily in mid- and larger-sized cities with three or more local cardiac competitors. One or more established competitors are a necessary condition for entry because cardiac specialty hospitals invariably form as a spin-off of "dissatisfied" cardiologist group(s) from a major tertiary provider, at least based on four case study cities. Because of their size and the fact that relatively few local hospitals offer open heart surgery, cardiac specialty hospitals almost always intensify competition and provoke vigorous competitive responses.

Orthopedic and surgical specialty hospitals can and do enter relatively small-sized markets as well as mid- and large-sized markets. Because they tend to have quite limited inpatient volumes and many more general hospitals offer orthopedic than cardiac surgery, the spillover volume effects from orthopedic and surgical specialty facilities is far less than for cardiac specialty hospitals. Several of these specialty hospitals are little more than ASCs with a few "back-up" beds for one-or two-night stays. However, because they can enter small markets (e.g., Rapid City, Spearfish, Yankton, and Aberdeen, South Dakota), their spillover volume impacts on the few other local hospitals can be sizable. Any "dumping" of complex medical patients back to local hospitals would also be more concentrated—with financial repercussions. Our case study analyses also indicated that orthopedic and surgical specialty hospitals offer fewer direct community benefits (e.g., treating Medicaid and uninsured patients), although they do pay taxes. One could also argue that where they enter a previously monopolized market, they may enhance patient access, encourage better patient services, and substitute for managed care in forcing the local hospital to accept deeper discounts with fee-for-service insurer.

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