








ORIGINAL RESEARCH

Assessment of Price Variation in Coronary Artery Bypass Surgery at US Hospitals

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BACKGROUND: Little is known about hospital pricing for coronary artery bypass grafting (CABG). Using new price transparency data, we assessed variation in CABG prices across US hospitals and the association between higher prices and hospital characteristics, including quality of care.

METHODS AND RESULTS: Prices for diagnosis related group code 236 were obtained from the Turquoise database and linked by Medicare Facility ID to publicly available hospital characteristics. Univariate and multivariable analyses were performed to assess factors predictive of higher prices. Across 544 hospitals, median commercial and self-pay rates were 2.01 and 2.64 times the Medicare rate (\$57 240 and \$75 047, respectively, versus \$28 398). Within hospitals, the 90th percentile insurer-negotiated price was 1.83 times the 10th percentile price. Across hospitals, the 90th percentile commercial rate was 2.91 times the 10th percentile hospital rate. Regional median hospital prices ranged from \$35 624 in the East South Central to \$84 080 in the Pacific. In univariate analysis, higher inpatient revenue, greater annual discharges, and major teaching status were significantly associated with higher prices. In multivariable analysis, major teaching and investor-owned status were associated with significantly higher prices (+\$8653 and +\$12 200, respectively). CABG prices were not related to death, readmissions, patient ratings, or overall Centers for Medicare and Medicaid Services hospital rating.

CONCLUSIONS: There is significant variation in CABG pricing, with certain characteristics associated with higher rates, including major teaching status and investor ownership. Notably, higher CABG prices were not associated with better-quality care, suggesting a need for further investigation into drivers of pricing variation and the implications for health care spending and access.

Key Words: coronary artery bypass surgery ■ coronary artery disease ■ health care spending ■ price transparency ■ price variation

Payment for hospital services in the United States remains poorly characterized. While Medicare has a national episode-based payment system, with published prices, the prices paid by commercial health insurance payers have been considered confidential. In 2021, the Centers for Medicare and Medicaid Services (CMS) issued new price transparency guidelines requiring hospitals to provide detailed pricing information for the first time.¹ Here, price is the amount negotiated by the insurance company, which includes

the payment from the insurance company to the hospital and any coinsurance payments for patients. The regulation aimed to provide greater transparency into health care prices for patients, payers, and regulators.

Since the enactment of the new price transparency legislation, multiple studies have documented substantial variation in payer-negotiated prices across a broad spectrum of medical services, including diagnostics, procedures, and prescription drugs.²⁻⁶ However, little has been published in the cardiovascular field, despite

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RESEARCH PERSPECTIVE

What Is New?

- Leveraging recent legislation mandating the release of hospital-reported commercial prices, we demonstrate a nearly 2-fold pricing variation within hospitals and a 3-fold variation between hospitals for coronary artery bypass grafting hospitalizations.
- Prices varied significantly by geography, teaching status, and investor ownership, among other hospital characteristics, but were not associated with either coronary artery bypass grafting–specific or hospital-wide outcomes, including 30-day mortality and readmission rates.

What Question Should Be Addressed Next?

- Given that higher coronary artery bypass grafting prices were not associated with higher quality of care, subsequent research should seek to further elucidate hospital- and insurer-level factors predictive of prices and identify opportunities for policy to reduce pricing variation not tied to outcomes.

Nonstandard Abbreviations and Acronyms

CMS	Centers for Medicare and Medicaid Services
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its contribution to overall US health care spending. Oseran et al surveyed a limited selection of 20 top-ranked US hospitals and found large price differences across routine outpatient cardiovascular tests such as echocardiography and angiography.⁷ Wei et al expanded the scope of the analysis to include all reporting hospitals nationwide for echocardiography and additionally assessed hospital factors influencing price variation.⁸ However, insurer-negotiated prices for inpatient cardiovascular care remains understudied. Furthermore, important questions remain unanswered about the association between price and quality of care. The association between cardiovascular quality of care measures with the price of care is a critical question.

Coronary artery bypass grafting (CABG) is a cornerstone in the management of coronary artery disease. In 2019, there were 160 000 isolated CABG surgeries, with 60 000 paid for by Medicare (amounting to >\$12 billion) and ≈100 000 reimbursed by commercial insurance plans.^{9,10} Because CABG is a common and high-cost procedure, it is important to understand how the

price for CABG varies across hospitals and how this variation relates to quality of care.

Using a database of listed hospital prices, we evaluated the variation in CABG prices within and across hospitals. We further compared commercial and self-pay prices relative to Medicare payments. Finally, we evaluated the association of CABG pricing with hospital characteristics and quality-of-care metrics.

METHODS

Data

The 2021 Hospital Price Transparency Rule required all US hospitals to release a publicly available, machine-readable file containing prices for medical services, including chargemaster, self-pay, and commercial rates. We extracted hospital price data from the Turquoise Health database, a commercial data source containing aggregated pricing information from 6378 hospitals.¹¹ This study was deemed exempt by the Stanford Institutional Review Board as it involved analysis of publicly available, deidentified data. The data that support the findings of this study are available from the corresponding author upon reasonable request.

CABG Price and Hospital Characteristics

We used prices for diagnosis related group code 236 (CABG without percutaneous transluminal coronary angioplasty without major cardiac complications) given that this is the most frequent CABG diagnosis related group across Medicare (33% of discharges attributable to diagnosis related groups 231–236).⁹ The data were queried on January 5, 2023, and reflect cross-sectional pricing data compiled from 2021 to 2022. Hospitals with the following identifiers were excluded: psychiatric, children's, imaging center, rehabilitation, Department of Defense, and Veterans Affairs. We also excluded hospitals with <2000 overall discharges annually.

Compliant hospitals were those with price data available in the database in an analyzable format, and noncompliant hospitals were those that did not have formatted price data in the database.

We enriched the pricing data from Turquoise Health with hospital and geographic characteristics as previously described (see [Table S1](#) for details).^{8,12–22} In brief, categorical hospital characteristics included major teaching status (defined as membership in the Council of Teaching Hospitals and Health Systems), US census-based division, major investor ownership, hospital type, rurality, and disproportionate share hospital status. Continuous characteristics included inpatient total revenue, annual inpatient discharges, total hospital beds, total system beds, and hospital referral region beds per 1000 people. Data on health care

prices, spending, usage, and socioeconomic vulnerability across US government-designated Core-Based Statistical Areas was sourced from the Health Care Cost Institute Healthy Marketplace Index.²² Data on market concentration as measured by the Herfindahl–Hirschman Index were also sourced from the Health Care Cost Institute.

Quality metrics were extracted from the CMS Hospital Compare database. This included the CMS hospital overall rating score, the Hospital Consumer Assessment of Healthcare Providers and Systems patient hospital rating score, post-CABG risk-adjusted 30-day mortality and readmission rates, and hospital-wide postdischarge risk-adjusted 30-day mortality and readmission rates. Readmission and mortality rates were standardized and were analyzed as categorical variables on the basis of their official statistical comparison to the national average (better, no different, or worse than the national average).²³

Statistical Analysis

Descriptive statistics were used to characterize the hospitals, while comparison of characteristics between compliant and noncompliant hospitals was performed using the chi-square test (Table S2). Variation in median commercial price within hospitals was assessed by calculating the ratio between the 90th and 10th percentile payer-negotiated rate (within-hospital ratio).⁸ Variation across hospitals was calculated by dividing the national 90th percentile hospital rate by the 10th percentile hospital rate (between-hospital ratio).²⁴ To minimize the impact of outliers, prices were Winsorized below the first percentile and above the 99th percentile.

Association between median commercial price per hospital and hospital factors was assessed via the Kruskal–Wallis test for categorical variables. To evaluate the association between continuous variables and CABG prices, we evaluated the Spearman rank correlation and used linear regression to estimate the association between a 1 SD change in the standardized continuous variable and CABG price. The hospital was the unit of analysis for both the categorical and continuous tests of association.

A multivariable linear regression model was generated on the basis of hospital characteristics meeting a *P* value threshold of <0.1 on univariate analysis and preselected variables of interest. To minimize collinearity, factors found to be associated with each other (*P*<0.05 on Fisher's exact test for categorical covariates and *r*>0.5 for continuous covariates) were filtered to include only the one most correlated with the outcome variable. The final variable list included major teaching status, investor ownership, disproportionate share hospital status, annual inpatient admissions, total system beds, hospital referral region hospital

beds per 1000 people, Herfindahl–Hirschman Index, and socioeconomic vulnerability index.

To assess the impact of quality of care on the aforementioned characteristics, a second multivariable model was generated including CABG-specific and hospital-wide outcome measures, which were treated as predictors: 30-day CABG readmission rate, 30-day CABG mortality rate, 30-day hospital wide readmission rate, 30-day hospital-wide mortality rate, Hospital Consumer Assessment of Healthcare Providers and Systems patient hospital rating, and CMS hospital rating. For a detailed breakdown of the covariates tested in the univariate and multivariable analysis, see Table S1.

Statistical analyses were performed using R Version 4.1.1 (R Foundation for Statistical Computing, Vienna, Austria) and Prism Version 9.4.0 (GraphPad Software, San Diego, CA). A *P* value of <0.05 was considered statistically significant for 2-sided comparisons. A standardized mean difference of >0.10 was considered meaningful.²⁵

RESULTS

Reporting Hospital Characteristics

Among 6378 hospitals in the Turquoise database, 1038 offered CABG and 544 were compliant with price transparency requirements (52.4%) (see Figure S1 for cohort creation process). Reporting hospitals differed from nonreporting hospitals across multiple characteristics (Table S2). Nonteaching hospitals, smaller hospitals, and hospitals earning less revenue were more likely to be noncompliant, while hospitals that were for-profit, investor owned, rural, and higher revenue were more likely to be compliant.

CABG Price Variation

There was significant variation in price across payer categories, with chargemaster, self-pay, and commercial rates being 4.96, 2.64, and 2.01 times the Medicare rate, respectively (Figure). The median within-hospital ratio of the 90th and 10th percentile payers in CABG commercial price was 1.83 (interquartile range, 1.33–2.60). The ratio of prices between the 90th and 10th percentile hospital nationally was 2.91. Prices varied substantially across census regions, with the lowest and highest median prices corresponding to the East South Central and Pacific regions, respectively (\$35 624 versus \$84 080).

Association Between Hospital and Regional Characteristics and CABG Price

Factors significantly associated with higher commercial CABG rates included higher total inpatient

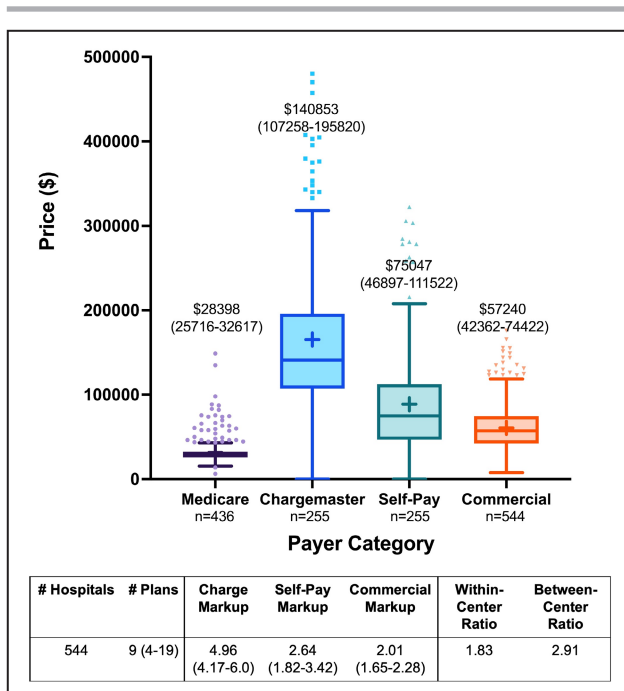


Figure. Comparison and variation of CABG prices across payers. CABG indicates coronary artery bypass grafting.

revenue (\$285 per \$100 million; $P<0.01$), more annual inpatient discharges (\$231 per 1000 discharges; $P<0.01$), and major teaching status (+\$4431; $P=0.01$) (Table 1). Investor-owned hospitals had higher prices, but this result did not achieve statistical significance (+\$7096; $P=0.06$). For-profit status ($P=0.65$), urban locality ($P=0.55$), number of hospital beds ($P=0.06$), and number of health system beds ($P=0.33$) were not significantly associated with price. Among regional factors, health care spending and health care pricing were significantly associated with higher CABG prices, whereas higher regional health care usage was associated with lower prices. Higher numbers of hospital beds per 1000 people within a hospital referral region was associated with lower prices (−\$8060 per 1000 people; $P<0.01$). There was no association between CABG price and regional socioeconomic vulnerability or market concentration as measured by Herfindahl–Hirschman Index.

In the multivariable analysis, investor ownership was associated with higher CABG price: +\$16 490 ($P<0.01$) and +\$8872 ($P=0.05$) with and without adjustment for hospital quality-of-care measures, respectively (Tables 2 and 3). Major teaching hospitals also had significantly higher CABG prices: +\$8961 ($P=0.01$) and +\$9531 ($P<0.01$) with and without adjustment for other hospital characteristics and quality measure performance. Each additional 1000 annual inpatient discharges was associated with a \$263 increase in CABG price ($P=0.03$) after all adjustments.

After accounting for hospital characteristics and quality performance, hospitals in the East North Central and Pacific regions charged significantly higher prices than New England, which was the reference region (+\$20 090 and +\$34 890, respectively; $P=0.02$ and $P<0.01$).

Association Between Mortality Rate and CABG Prices

There was no statistically significant association between mortality rate and CABG price. There was a weak correlation for the CABG-specific 30-day mortality rate ($r=-0.07$) and a weak association for hospital-wide mortality rate ($P=0.19$). There was not a significant association between CABG-specific 30-day mortality rate and CABG price (−\$1293 per 1 SD increase in mortality rate [95% CI, −\$3712 to \$1126]). After adjusting for hospital and regional characteristics (Table 3), the CABG mortality rate was not associated with price ($P=0.68$). The results were similar for the hospital-wide mortality rate (Table 3).

Association Between Readmissions and CABG Prices

There was similarly no statistically significant association between readmissions and CABG price. CABG-specific 30-day readmissions showed a weak correlation with CABG price ($r<0.01$). There was no significant association between hospital-wide readmissions and price ($P=0.26$), nor was there an association with CABG readmissions (+\$616 per 1 SD increase in readmission rate [95% CI, −\$1781 to \$3014]). After adjusting for selected hospital characteristics and quality metrics, CABG-specific readmissions were still not associated with price ($P=0.40$; Table 3). This was true for hospital-wide readmissions as well (Table 3).

Association Between Hospital Ratings and CABG Prices

Patient ratings were not associated with price ($P=0.30$). Higher CMS hospital rating were associated with higher price in univariate analysis ($P=0.02$). After adjusting for hospital characteristics and quality performance, the association between CMS hospital rating was no longer significant. Hospitals with higher patient Hospital Consumer Assessment of Healthcare Providers and Systems scores had higher CABG prices, with a 5-star hospital having a \$22 020 (95% CI, −\$4616 to \$48655) higher price than a hospital with a 1-star rating, although this did not achieve statistical significance ($P=0.10$).

DISCUSSION

The 2021 Federal Hospital Price Transparency Rule was enacted to promote price transparency across

Table 1. Univariate Analysis of Factors Associated With CABG Commercial Price

Hospital categorical factors	No. of hospitals	Median price	IQR	P value
Teaching status				
Major teaching	114	60809	46546–79183	0.01
Not major teaching	430	56378	41197–71313	
Region				
New England	16	57386	40557–70139	<0.01
Middle Atlantic	70	52773	43082–72398	
South Atlantic	100	64287	54103–80299	
East North Central	123	61695	45138–75183	
East South Central	26	35624	30463–52551	
West North Central	49	49876	39563–59977	
West South Central	125	46139	39283–63020	
Mountain	15	75747	73085–85014	
Pacific	19	84080	63763–95672	
Major investor owned				
Major investor owned	95	63020	43175–78252	0.06
Not major investor owned	449	55924	41699–72128	
Hospital type				
For-profit	104	62618	41650–77296	0.65
Not-for-profit	385	55969	41621–72128	
Government	49	59611	45938–75203	
Urban/rural				
Urban	524	56970	42373–73671	0.55
Rural	19	62219	41265–85420	
DSH				
DSH	476	58237	42732–75364	0.12
Not DSH	68	49696	41311–68583	
Hospital continuous factors	No. of hospitals	Regression coefficient±SE	Spearman P value	Correlation coefficient (r)
Inpatient total revenue (per \$100 million)	536	285±67	<0.01	0.22
Annual inpatient discharges (per 1000)	536	231±81	<0.01	0.13
Total hospital beds (per 100)	544	884±368	0.06	0.08
Total system beds (per 1000)	532	416±108	0.33	–0.04
HRR hospital beds per 1000	544	–8060±2365	<0.01	–0.20
CBSA health care price index	434	50349±8482	<0.01	0.30
CBSA health care spending index	434	46941±9877	<0.01	0.26
CBSA health care usage index	434	–18685±8583	0.03	–0.10
CBSA socioeconomic vulnerability index	434	86±6690	0.67	0.02
HHI market concentration (per 1000)	434	–556±982	0.17	–0.07
Hospital-wide outcomes	No. of hospitals	Median price	IQR	P value
CMS hospital-wide mortality rate				
Better than national average	132	55495	43224–75310	0.19
Same as national average	287	55924	41585–71260	
Below national average	107	61525	43192–80283	
CMS hospital-wide readmission				
Better than national average	239	59246	43017–75174	0.26
Same as national average	46	51384	44108–65095	
Below national average	241	56387	41140–75362	

Continued

Table 1. Continued

Hospital-wide outcomes	No. of hospitals	Median price	IQR	P value
HCAHPS patient hospital rating				
1	13	60900	35690–77741	0.30
2	113	55174	39609–73353	
3	295	57042	42744–75291	
4	111	58413	44661–73370	
5	2	36631	36469–36793	
CMS overall hospital rating				
1	28	62163	53563–82491	0.02
2	105	54933	39612–75203	
3	159	53154	39697–67913	
4	167	59350	43726–78306	
5	79	58062	44035–76833	
CABG outcomes	No. of hospitals	Regression coefficient±SE	Spearman P-value	Correlation coefficient (r)
CMS CABG 30-d mortality rate	463	–1293±1231	0.15	–0.07
CMS CABG 30-d readmission rate	461	616±1220	0.92	<0.01

CABG indicates coronary artery bypass grafting; CBSA, core-based statistical area; CMS, Centers for Medicare and Medicaid Services; DSH, disproportionate share hospital; HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; HHI, Herfindahl–Hirschman Index; HRR, hospital referral region; and IQR, interquartile range.

medical services, with the goal of reducing pricing variability and financial inequity. For CABG surgery, we found that median commercial payments were more than 2 times higher than Medicare payments. We also observed substantial variation in prices at the hospital level and within hospitals.

Economists often relate price and quality, with consumers seeing price as a proxy for quality. In this study, we found that the commercial health plan price for CABG was not significantly associated with the quality of care across several important metrics of hospital quality. Rather, price was associated with hospital

Table 2. Multivariable Associations Between Hospital and Regional Characteristics and CABG Price

Hospital/health system factors (n=544)	Estimate±SE*	95% CI	P value
Region			
New England	Reference		
Middle Atlantic	14410±8151	–5972 to 30433	0.08
South Atlantic	20670±8288	–1614 to 36967	0.01
East North Central	19870±8065	4380 to 35724	0.01
East South Central	–1640±9924	4012 to 17869	0.87
West North Central	10420±8693	–21149 to 27510	0.23
West South Central	6203±8887	–6669 to 23675	0.49
Mountain	29460±11680	–11269 to 52427	0.01
Pacific	34010±10710	6495 to 55073	<0.01
Major teaching (Reference: not major teaching)	9531±3373	2900 to 16163	<0.01
Major investor owned (Reference: not investor owned)	8872±4512	1 to 17742	0.05
DSH Abbreviations: (Reference: Not DSH)	1239±3668	–5972 to 8450	0.74
Annual inpatient discharges (per 1000)	274±109	59 to 489	0.01
Total system beds (per 1000)	58±156	–249 to 364	0.71
HRR hospital beds per 1000 (per 1 bed)	–2306±3646	–9115 to 4503	0.51
Herfindahl–Hirschman Index	5250±10310	–1501 to 2552	0.61
Socioeconomic vulnerability index	8717±8945	–8868 to 26302	0.33

*Regression coefficient±standard error.

DSH indicates disproportionate share hospital; and HRR, hospital referral region.

Table 3. Multivariable Associations Between Hospital and Regional Characteristics and CABG Price Including Hospital-Wide and CABG-Specific Outcomes

Outcomes (n=544)	Estimate±SE*	95% CI	P value
Hospital 30-day mortality rate			
Better than national average	Reference		
Same as national average	3813±4651	-5338 to 12964	0.41
Below national average	3804±3387	-2859 to 10467	0.26
Hospital 30-day readmission			
Better than national average	Reference		
Same as national average	-2872±3158	-9085 to 3342	0.36
Below national average	-4121±4996	-13949 to 5707	0.41
CABG 30-d mortality rate	-583±1416	-3368 to 2203	0.68
CABG 30-d readmission rate	1155±1382	-1564 to 3874	0.40
CMS overall hospital rating			
1	Reference		
2	-6242±6183	-18406 to 5921	0.31
3	-10390±6296	-22776 to 1997	0.10
4	125±6844	-13340 to 13589	0.99
5	-11950±8028	-27743 to 3844	0.14
HCAHPS patient hospital rating			
1	Reference		
2	7819±9440	-10752 to 26390	0.41
3	12320±9446	-6267 to 30901	0.19
4	16120±9703	-2964 to 35213	0.10
5	22020±13540	-4616 to 48655	0.10
Region			
New England	Reference		
Middle Atlantic	13200±8714	-3945 to 30341	0.13
South Atlantic	17860±8980	193 to 35526	0.05
East North Central	20090±8613	3144 to 37031	0.02
East South Central	-2874±10760	-24034 to 18286	0.79
West North Central	7536±9508	-11169 to 26242	0.43
West South Central	-512±9774	-19740 to 18716	0.96
Mountain	25350±12760	253 to 50452	0.05
Pacific	34890±11450	12363 to 57422	<0.01
Major teaching (reference: not major teaching)	8961±3654	1773 to 16148	0.01
Major investor owned (reference: not investor owned)	16490±5482	5705 to 27275	<0.01
DSH (reference: not DSH)	-2432±4403	-11094 to 6229	0.58
Annual inpatient discharges (per 1000)	263±121	25 to 502	0.03
Total system beds (per 1000)	-8±18	-362 to 345	0.96
HRR hospital beds per 1000 (per 1 bed)	-742±3900	-8414 to 6930	0.85
Herfindahl-Hirschman Index	6048±11640	-16858 to 28954	0.60
Socioeconomic vulnerability index	16840±9992	-2817 to 36496	0.09

CABG indicates coronary artery bypass grafting; CMS, Centers for Medicare and Medicaid Services; DSH, disproportionate share hospital; HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; and HRR, hospital referral region.

*Regression coefficient±standard error.

characteristics including major teaching status, investor ownership, and hospital-wide volume. While a strict comparison with prior literature is not possible given the lack of commercial price data availability before 2021, previous studies using statewide and nationwide

claims data have not found an association between prices and clinical outcomes.²⁶⁻³⁰ Another study examining out-of-pocket prices for CABG also found no association between quoted prices and CABG-specific quality metrics.³¹

There are significant questions about the overall structure of the US health care market, the impact of hospital consolidation on hospital market power in payer price negotiations, and the value associated with a market that requires individual negotiation of hospital–payer contracts. The policy community has been keen to examine the data provided by the Hospital Price Transparency Rule to gain greater insight into the functioning of this market. These results seem to raise more questions than answers to these larger policy questions. While documenting substantial regional pricing variation and substantial differences between commercial prices and Medicare payments, the intrahospital price variation is much greater than has been previously known. This variation could be related to underlying negotiation relationships between health plans and hospitals or could represent a significant inefficiency on the part of health plan negotiations. The source of this variation requires further study.

To our knowledge, this study is the first to assess commercial price variation and predictors of prices for CABG. While lower than the variation in price for other services, including percutaneous coronary intervention (3.6 times) and oncologic surgery (~5–20 times), the within- and between-hospital variation in CABG prices is substantial, considering that the median commercial price is \$57 240.^{5,7} With commercial payers responsible for 62.5% of CABG operations in the United States, the markup between commercial and Medicare prices could account for up to \$3 billion in added health care expenditures annually.^{9,32}

Previous reports of CABG prices have relied on cost-to-charge ratios, with estimates that vary from \$36 400 to \$52 434.^{26,33,34} These estimates are prone to inaccuracies because cost-to-charge ratios do not account for differences across service lines.³⁵ Furthermore, charges are determined at the discretion of individual hospitals, and their methodology is often opaque. Finally, the rates arrived at using cost-to-charge ratios are indexed to Medicare allowable rates and do not reflect the actual prices that insurers pay. The present study adds valuable real-world data, demonstrating higher commercial CABG payment rates than previous estimates determined from cost-to-charge ratios. We also found more variation in commercial rates than estimated in prior studies.^{26,34}

In addition to substantial heterogeneity in commercial rates across hospitals, we also observed significant variation in self-pay rates for CABG. The interquartile range for self-pay rates was \$64 626, ranging from \$46 897 to \$111 523. It is unclear what these amounts represent—they could be the basis for negotiating with patients for discounted care or an amount used by the hospital in the calculation of their community benefit.³⁶ What is clear is that these prices are higher than the

Medicare payment rate in 87% of reporting hospitals and higher than the median commercial payment in 59% of hospitals.

Two years after the price transparency rule was enacted, compliance remains poor (52.3% in this study, which is similar to other recent estimates ranging from 48% to 59%).^{37,38} Reasons for the persistently low adherence rate are multifactorial but likely include low penalties and inconsistent enforcement.³⁹ Additional enforcement efforts may be needed to ensure broader reporting.

This study has several limitations. The data analyzed were cross-sectional and do not reflect trends in price over time. Pricing data were not available from noncompliant hospitals, which may have differences in pricing structure compared with compliant hospitals. There were also some differences in the characteristics of compliant versus noncompliant hospitals, which may be a source of potential bias. Some hospitals also had missing characteristics, which may influence the associations identified here, but this constituted a small minority of the total cohort. The outcome metrics studied here were limited to Medicare patients, not patients with private health insurance. However, Medicare patients constitute a large proportion of CABG surgeries. Finally, this study did not capture costs after the index hospitalization, which would be valuable in comparing payment variation across an entire episode of care.

Overall, private health plan payments for CABG were significantly greater than Medicare prices. There is significant inter- and intrahospital variation in negotiated prices for CABG. Variations in CABG prices were associated with hospital characteristics but not with hospital quality. These data raise important questions about the efficiency of administration in the US health care market.

ARTICLE INFORMATION

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Disclosures

None.

Supplemental Material

Data S1.

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