

Predictors of Price Transparency for Cataract Surgery and Laser Posterior Capsulotomy at Academic Hospitals in the United States

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ABSTRACT

PURPOSE: To describe the characteristics of United States (US) academic hospitals that predict transparency of cash and commercial payer-negotiated prices for cataract surgery (CS) and laser posterior capsulotomy (LPC).

METHODS: A systematic review of websites for hospitals affiliated with ophthalmology residency programs was conducted to determine price transparency. Hospital characteristics were extracted from the American Hospital Association Annual Survey and Turquoise Health. Descriptive statistics, t-tests, χ^2 tests, and logistic regression analyses were used to compare hospitals based on price transparency for CS and LPC.

RESULTS: There were no differences in price transparency for CS and LPC based on net income, urban-rural classification, region, hospital beds, or surgical operations. Having more full-time personnel was associated with cash price transparency. No differences were identified between hospitals based on payer-negotiated price transparency.

CONCLUSIONS: Academic hospitals for ophthalmology with more full-time personnel had greater cash price transparency for CS and LPC. However, price transparency did not vary for other characteristics.

KEYWORDS: price transparency, cost, cataract surgery, laser posterior capsulotomy

INTRODUCTION

Price transparency is one focus in efforts to reduce health-care costs. Many hospitals are not in compliance with Centers for Medicare and Medicaid Services (CMS) requirements to disclose cash and payer-negotiated prices for seventy inpatient and outpatient services, including cataract surgery (CS) and laser posterior capsulotomy (LPC).¹ This study identified predictors of price transparency for CS and LPC among United States (US) academic hospitals for ophthalmology.

METHODS

The Rhode Island Hospital Institutional Review Board determined this research did not involve human subjects or require further review.

Academic hospitals were defined as primary hospital affiliates of Accreditation Council for Graduate Medical Education-accredited ophthalmology residency programs. US Department of Veterans Affairs and Department of Defense hospitals were not included, given their different payment models. Each hospital's website was reviewed in September 2021 to determine cash and payer-negotiated prices for CS (Current Procedural Terminology [CPT] code: 66984) and LPC (CPT code: 66821).

Price-disclosing competitors for CS or LPC within 10 miles were identified using Turquoise Health, a public database of hospital prices. Hospital ownership was categorized as nonprofit, for profit, or state/local government. Number of hospital beds, surgical operations, and full-time personnel and net income were extracted from the American Hospital Association (AHA) Annual Survey. The number of full-time personnel included all full-time employees, including licensed providers, nurses, and housekeeping staff. Urban-rural classification was based on US Department of Agriculture Rural-Urban Commuting Area codes; region was based on US Census Bureau designations.

Descriptive statistics, student t-tests, and χ^2 tests were used to analyze differences between hospitals based on price transparency for CS and LPC. Logistic regression was used to calculate odds ratios associated with price transparency. Statistical analyses were conducted using Stata with alpha=0.05.

RESULTS

One hundred eighteen academic hospitals for ophthalmology were included; most were nonprofits (65%; 77/118) and in metropolitan areas (98%; 116/118). Most hospitals disclosed cash prices for CS and LPC (54%; 64/118) but not commercial payer-negotiated prices (13%; 15/118).

Hospitals with more full-time personnel were more likely to disclose cash prices for CS and LPC (**Table 1**); no significant differences were identified between hospitals for payer-negotiated price transparency (**Table 2**). Hospitals that did not disclose prices for CS were less likely to disclose prices for LPC (18% vs 59%; $p<0.001$), and hospitals that did not disclose prices for LPC were less likely to disclose prices for CS (20% vs 62%; $p<0.001$).

In logistic regression, having $\geq 6,000$ full-time personnel [OR=2.13, 95% CI=1.01–4.50] was associated with cash price transparency; no variables were significantly associated with payer-negotiated price transparency (**Table 3**).

Table 1. Characteristics of academic hospitals that do or do not report cash prices for CS and LPC

Characteristics	Hospitals disclosing both cash prices (n=64)	Hospitals not disclosing both cash prices (n=54)	Test statistic, p-value
Urban-rural classification, n (%)^a			
Metropolitan	62 (97)	54 (100)	$\chi^2=1.72$, p=0.190
Micropolitan	2 (3)	0 (0)	
Small town	0 (0)	0 (0)	
Rural	0 (0)	0 (0)	
Competitors within 10 miles, mean (SD)^b	3.41 (4.34)	2.20 (2.59)	t=-1.78, p=0.077 $\chi^2=2.11$, p=0.146
0-4, n (%)	42 (66)	42 (78)	
5+	22 (34)	12 (22)	
Ownership, n (%)			$\chi^2=5.43$, p=0.066
Nonprofit	42 (66)	36 (67)	
For profit	0 (0)	4 (7)	
Public	22 (34)	14 (26)	
Region, n (%)			$\chi^2=7.60$, p=0.107
Northeast	20 (31)	13 (24)	
West	9 (14)	5 (9)	
South	16 (25)	25 (46)	
Midwest	19 (30)	10 (19)	
Other (Puerto Rico)	0 (0)	1 (2)	
Hospital beds, mean (SD)	694.81 (410.97)	633.74 (411.12)	t=-0.80, p=0.423 $\chi^2=0.09$, p=0.767
0-649, n (%)	35 (55)	31 (57)	
650+	29 (45)	23 (43)	
Surgical operations, mean (SD)	34393.86 (29491.65)	26724.96 (29913.34)	t=-1.40, p=0.165 $\chi^2=1.15$, p=0.284
0-29999, n (%)	39 (61)	38 (70)	
30000+	25 (39)	16 (30)	
Full-time personnel, mean (SD)	7660.11 (6080.14)	4917.83 (4202.08)	t=-2.80, p=0.006 $\chi^2=4.65$, p=0.031
0-5999, n (%)	30 (47)	36 (67)	
6000+	34 (53)	18 (33)	
Net income, mean (SD)	85807483.95 (258030204.10)	106624568.90 (319670283.90)	t=0.49, p=0.627 $\chi^2=3.39$, p=0.336
\$0 to \$-1,654,754, n (%)	20 (31)	10 (18)	
\$-1,654,754 to \$2.97e7	14 (22)	15 (28)	
\$2.97e7 to \$1.09e8	13 (20)	13 (24)	
\$1.09e8+	17 (27)		

CS, cataract surgery; LPC, laser posterior capsulotomy; SD, standard deviation. Statistically significant relationships are bolded.

^a Based on Rural-Urban Commuting Area codes provided by the United States Department of Agriculture

^b Provided by Turquoise Health, a publicly available database of hospital prices for services and items

^c Provided by the American Hospital Association Annual Survey

^d Provided by the American Hospital Association Financial Database

Table 2. Characteristics of academic hospitals that do or do not report payer-negotiated prices for CS and LPC

Characteristics	Hospitals disclosing both insurance prices (n = 26)	Hospitals not disclosing both insurance prices (n = 92)	Test statistic, p-value
Urban-rural classification, n (%)^a			
Metropolitan	25 (96)	91 (99)	$\chi^2=0.93$, p=0.336
Micropolitan	1 (4)	1 (1)	
Small town	0 (0)	0 (0)	
Rural	0 (0)	0 (0)	
Competitors within 10 miles, mean (SD)^b	4.08 (4.40)	2.51 (3.40)	t=-1.94, p=0.055 $\chi^2=2.96$, p=0.085
0-4, n (%)	15 (58)	69 (75)	
5+	11 (42)	23 (25)	
Ownership, n (%)			$\chi^2=2.32$, p=0.313
Nonprofit	20 (77)	58 (63)	
For profit	0 (0)	4 (4)	
Public	6 (23)	30 (33)	
Region, n (%)			$\chi^2=4.22$, p=0.377
Northeast	7 (27)	26 (28)	
West	3 (12)	11 (12)	
South	6 (23)	35 (38)	
Midwest	10 (38)	19 (21)	
Other (Puerto Rico)	0 (0)	1 (1)	
Hospital beds, mean (SD)	542.81 (333.73)	701.92 (424.65)	t=1.76, p=0.081 $\chi^2=1.29$, p=0.255
0-499, n (%)	14 (54)	38 (41)	
500+	12 (46)	54 (59)	
Surgical operations, mean (SD)	25397.08 (25320.04)	32435.12 (30904.02)	t=1.06, p=0.290 $\chi^2=2.70$, p=0.101
0-24999, n (%)	18 (69)	47 (51)	
25000+	8 (31)	45 (49)	
Full-time personnel, mean (SD)	5520.92 (4332.94)	6655.07 (5731.78)	t=0.94, p=0.352 $\chi^2=1.21$, p=0.272
0-5999, n (%)	17 (65)	49 (53)	
6000+	9 (35)	43 (47)	
Net income, mean (SD)	16367180.92 (119746058.60)	117650641.20 (315476285.50)	t=1.60, p=0.112 $\chi^2=3.57$, p=0.312
\$0 to \$-1,654,754, n (%)	8 (31)	15 (16)	
\$-1,654,754 to \$2.97e7	7 (27)	21 (23)	
\$2.97e7 to \$1.09e8	5 (19)	24 (26)	
\$1.09e8+	6 (23)	32 (35)	

CS, cataract surgery; LPC, laser posterior capsulotomy; SD, standard deviation. Statistically significant relationships are bolded.

^a Based on Rural-Urban Commuting Area codes provided by the United States Department of Agriculture

^b Provided by Turquoise Health, a publicly available database of hospital prices for services and items

^c Provided by the American Hospital Association Annual Survey

^d Provided by the American Hospital Association Financial Database

Table 3. Predictors of academic hospital transparency for cash and payer-negotiated prices for CS and LPC

Characteristics	Cash prices OR [95% CI]	Payer-negotiated prices OR [95% CI]
Urban–rural classification		
Metropolitan	1 [reference]	1 [reference]
Micropolitan	1 [omitted] ^a	3.64 [0.22–60.27]
Small town		
Rural		
Competitors within 10 miles		
0–4	1 [reference]	1 [reference]
5+	1.83 [0.80–4.18]	2.20 [0.89–5.47]
Ownership		
Nonprofit	1 [reference]	1 [reference]
For profit	1 [omitted] ^b	1 [omitted] ^b
Public	1.35 [0.60–3.01]	0.58 [0.21–1.60]
Region		
Northeast	1 [reference]	1 [reference]
West	1.17 [0.32–4.28]	1.01 [0.22–4.66]
South	0.42 [0.16–1.06]	0.64 [0.19–2.12]
Midwest	1.24 [0.44–3.48]	1.95 [0.63–6.07]
Other (Puerto Rico)	1 [omitted] ^b	1 [omitted] ^b
Hospital beds		
0–499, n (%)	1 [reference]	1 [reference]
500+	1.36 [0.65–2.82]	0.60 [0.25–1.45]
Surgical operations		
0–24999, n (%)	1 [reference]	1 [reference]
25000+	1.81 [0.86–3.79]	0.46 [0.18–1.17]
Full–time personnel		
0–5999, n (%)	1 [reference]	1 [reference]
6000+	2.27 [1.07–4.79]	0.60 [0.24–1.49]
Net income		
\$0 to \$–1,654,754, n (%)	1 [reference]	1 [reference]
\$–1,654,754 to \$2.97e7	0.67 [0.22–2.02]	0.63 [0.19–2.10]
\$2.97e7 to \$1.09e8	0.63 [0.21–1.88]	0.39 [0.11–1.42]
\$1.09e8+	1.48 [0.51–4.28]	0.35 [0.10–1.19]

CS, cataract surgery; LPC, laser posterior capsulotomy; CI, confidence interval; OR, odds ratio. Statistically significant relationships are bolded.

^a Omitted due to collinearity

^b Omitted due to perfect prediction

DISCUSSION

Academic hospitals with more full-time personnel disclosed cash prices for CS and LPC more often, possibly due to more personnel working on chargemasters or a threshold effect of market dominance. They may also be in areas with more physicians and healthcare workers, lowering physician fees and prices for services, contributing to a greater willingness to disclose prices.^{2,3}

Differences were not identified between hospitals based on payer-negotiated price transparency. Previous research demonstrated that insurers with stronger market power, such as national insurers, negotiate lower prices,^{2,3} possibly standardizing price transparency among hospitals.

Cost of healthcare is a key barrier to healthcare access, especially for people of color who tend to be uninsured and have less disposable income.⁴ Price transparency reform

may be a means of reducing the high cost of care in the US and addressing health disparities. Non-disclosure for CS and for LPC were associated with each other, underscoring the importance of assessing price transparency for other procedures at academic hospitals.

Opponents of price transparency reform have cited the burden of maintaining a chargemaster. In response, CMS developed a sliding scale of penalties for noncompliance based on hospital size, measured by hospital beds. However, consistent with previous research outside of ophthalmology,⁵ our study finds that cash and payer-negotiated price transparency for CS and LPC did not differ based on number of hospital beds or surgical volume.

Limitations of this study include limited generalizability to non-academic hospitals and non-cataract procedures. Additionally, many hospitals imposed barriers to accessing price data such as anti-automation software, which we adjusted for with multiple chargemaster searches.

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