

# Hospital Price Transparency Perceptions and Observations in the United States: A Rapid Review

Cristian Lieneck<sup>1</sup>, Kaven Darty<sup>2</sup>, Caitlin Huddleston<sup>2</sup>, Jason Kreczmer<sup>2</sup>, Stacy Lambdin<sup>2</sup>, and Dylan Young<sup>2</sup>

<sup>1</sup>MHA, PhD, School of Health Administration, Texas State University  
San Marcos, Texas 78666

<sup>2</sup>Healthcare Administration Student, School of Health Administration, Texas State University  
San Marcos, Texas 78666

**Abstract:** *Background and Objectives:* The Centers for Medicare and Medicaid (CMS) began implementing the Hospital Price Transparency Rule in 2019, requiring all participating hospitals to publish their chargemasters online (gross charges) for all services provided. Policy implementation at the organization level has been questionable, with patients and health care consumers left interpreting detailed hospital financial information available online. The research objective was to investigate price transparency perceptions and observations since the introduction of shoppable services price transparency mandates in 2021. *Materials and Methods:* Reviewers conducted a rapid review and identified and analyzed 20 articles and identified common themes. *Results and Conclusions:* Four underlying constructs surrounding hospital price transparency were identified: compliance and non-compliance with the CMS (2019) price transparency rule, pricing disparities, and accessibility/usability of public pricing information. The results of this rapid review provide insight for improving health service price transparency for the health care consumer and the potential limiting of follow-on surprise billing practices, while also helping to adapt policy on future price transparency initiatives.

**Keywords**— hospital; price transparency; price estimate; charge master; surprise billing

## 1. INTRODUCTION

### 1.1. Rationale

The United States healthcare system, being the only private system in the world, continues to struggle with cost and access to care. An estimated 18% (one in five) of U.S. adults claim they would be unable to pay for immediate/urgent care during 2021 [1]. Further, it is estimated that 35% of low-income earners have been unable to pay for health care received within the past 12 months (prior to February 2021) [1]. Complicating the provision of care to meet necessary demand also includes various guarantors, often involving a third-party payer. Such entities may include commercial (private) health insurance (purchased either from [www.healthcare.gov](http://www.healthcare.gov) or an individual's employer), and/or government third-party payers such as Medicaid and Medi-care programs.

Additionally, the individual patient's cost of care is often unknown prior to, during, and sometimes even after the delivery of care in the U.S. began requiring U.S. hospitals enrolled as Medicaid and/or Medicare participating providers to publish their chargemaster list to promote price transparency. This initiative has been implemented to assist healthcare consumers know the cost of any covered item or service prior to receiving care [2, 3]. Chargemaster lists, at the individual healthcare organization level, list gross (total) charges for all items and services, otherwise also the same as the amount that uninsured patients are billed (full billed charges), self-pay patients, and patients with out-of-network commercial coverage [3]. This information, per CMS, is to be posted/visible online and easily accessible for patients and other healthcare stakeholders to access to assist in

understanding the cost of care before, during, and even after treatment [2].

Since initial 2019 price transparency initiatives, CMS continues to require additional requirements for healthcare organizations to follow regarding price transparency information published and available in the online domain [2]. The next wave of information to be provided (besides simply gross charges for items/services) is January 1, 2023, and then an additional list of requirements on January 1, 2024 [2]. These additional actions involve changes to the presentation and accessibility of hospital chargemaster listings, while also attempting to control for and provide visibility to healthcare consumers with a variety of third-party payer coverage. However, to-date, price transparency attempts have been confusing, at best. Quality of care is also in question, especially the potential for healthcare consumers to shop for the best price for any given service may potentially lead to foregoing an assessment of quality and outcomes as important decision variables. Additionally, others may solicit information from their primary care provider or other healthcare professional to address both cost and quality concerns.

Complicating the initiative of price transparency is the concept of surprise billing. Related to the U.S. healthcare system's price transparency initiative, surprise billing occurs when care is provided, often unexpectedly and/or unknown by the patient, with out-of-network providers [4]. As a result, the out-of-network provider(s) involved with the patient's care then balance-bills the patient for the difference between any charges billed and the amount paid (if any) by the patient's third-party payer. Policies have been passed (Consolidated Appropriations Act of 2021 and the No

Surprises Act under title I and Transparency under title II) to help limit surprise billing and related healthcare consumer issues, to include emergency-related care received by out-of-network providers [4]. However, payment disagreements continue to occur due to pricing transparency issues.

## 1.2. Objectives

This rapid review provides an objective assessment of publications in quality peer-reviewed journals as related to U.S. hospital price transparency initiatives in an attempt to gain insight into perceptions and observations to-date by healthcare stakeholders. Hospitals are required to meet CMS price transparency initiatives if they accept and treat Medicare and Medicaid patients, yet interpretation and implementation efforts occur and need to be evaluated at the organization-level (mutually exclusive among hospitals). The rapid review process is often utilized in lieu of a full systematic review during time constraints, expertise, and/or absence of funding, and this simplified and fast synthesis of information has been deemed of value by industry stakeholders, especially during the COVID-19 pandemic [5, 6]. In the end, a codification of perspectives and observations related to price transparency initiatives will provide policymakers with important information to better understand all healthcare industry stakeholders' use of hospital price information to further support overall care delivery.

## 2. METHODS

This rapid review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and the Cochrane Handbook [7]. Articles included in the review focused on stakeholder perceptions and observations of hospital price transparency initiatives at the individual hospital level. Researchers focused on price transparency initiative studies and reports from all healthcare stakeholder perspectives (patient, provider, hospital leadership, etc). The search was conducted using the research database search string shown in Figure 1.

[("hospital\*")] AND [(("price transparency") OR ("price estimate\*") OR ("charge master"))]

**Figure 1.** Research database search string and Boolean search operators that yielded the highest frequency of results in the search.

Researchers conducted several adjustments to the search string and associated Boolean operators in an effort to yield the highest number of search results (number of articles), while also controlling for number of duplicates identified. The "hospital" and "price estimate" terms were truncated (\*) in the database search to allow for various uses of the terms in the review articles identified (plural uses of the terms, etc). This review criteria did yield articles that focused on additional/other healthcare industry price topics and

themes, which were later excluded by the research team during the review process.

### 2.1. Eligibility Criteria

The search process specifically targeted articles/studies of all types in the peer-reviewed literature library database. Articles had to be published in quality peer-reviewed journals and available on the institution's the Ebscon B. Stephens Company (EBSCO host) and PubMed (which queries MEDLINE). Five research databases were utilized in the search that a) increased the number of total search results for the review, while b) eliminating overall duplicate article findings: MEDLINE Complete, CINHALL Complete, Complementary Index, Academic Search Complete, and Business Source Complete.

Articles included in the review were assessed for strength of evidence by utilizing the Johns Hopkins evidence-based practice rating scale (JHNEBP), a tool used to assist in clinical decision making which includes an evidence appraisal step to determine strength of evidence (articles in the review). To best identify articles focusing on shoppable services via publicly available (online) pricing availability and related themes, the research team limited the database search to 2021, forward in an attempt to identify research articles published after the mandate went into effect (2021, forward). Articles included in the review had a publication date within the January 1, 2021 (the beginning of CMS price transparency initiatives), to March 3, 2022 research database publication date range. The search was conducted by the research team from March 1-3, 2022. Full text was not included as an initial search criterion (data-base search and related article identification) in order to yield as many search results as possible. Identification of full-text versions of each identified research article was later accomplished by the research team for all articles identified for the review (100% of the articles identified in full-text format by the research team).

This study's information came from secondary data sources (library research database). All literature included in this research are publicly available and any individual research subjects (if present) are unidentifiable. As a result, this systematic re-view qualifies under "exempt" status in 45 Code of Federal Regulations (CFR) 46. An institutional review board review was not required, and no consent was necessary. No funding was provided for this rapid review.

### 2.2. Exclusion Process

Figure 2 illustrates the article exclusion process. The initial research database search yielded 6,949 results and the review team concluded the search and exclusion process with a final literature sample of 20 articles. Reviewers were guided by the lead researcher/author (C.L.) and related article coding efforts, possessing over ten years of healthcare leadership experience and published numerous rapid/systematic reviews.

The rapid review process was initiated using the EBSCOhost interface at Texas State University, allowing for a wide range of research databases to be queried, while offering initial article exclusion options. Upon recognition and omission of duplicate articles (1,520), the interface further eliminated 5,402 articles based on initial search parameter requirements (search date range parameters, full-text articles only, peer-reviewed only, and English only). While a small amount of

literature was identified for review, the narrow search parameters helped to isolate only studies related to price transparency perceptions and observations as related to shoppable services in 2021, forward. Further exclusion included the use of the research database’s “U.S. only” study option (checkbox), therefore helping to further identify studies that focused only on the area of interest for this study, as related to the CMS price transparency initiative.

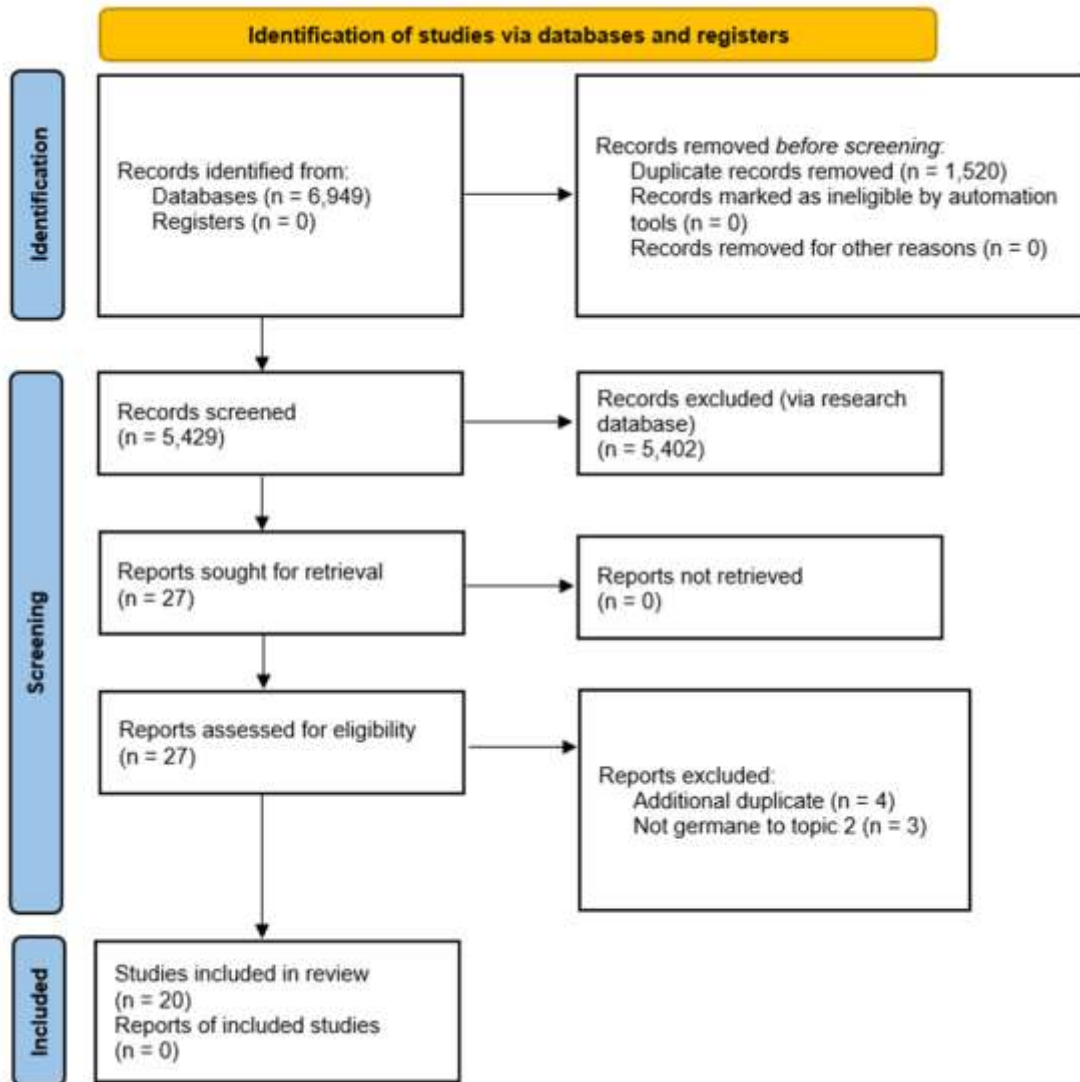


Figure 2. Preferred reporting items for systematic reviews and meta-analysis (PRISMA) figure that demonstrates the study selection process.

A rigorous review of the 20 articles was conducted by the authors by reading the full manuscripts of each article. This was accomplished by an internal numbering of the articles and all researchers reviewing all 20 manuscripts collectively, with each article being reviewed by two or more researchers (Table 1). Next, reviewers split into two separate groups to review the assigned articles to identify the underlying themes related the perceptions and observations of price transparency initiatives. Researcher collaboration meetings were conducted via webinar and in-person on multiple occasions. Minor disagreements among researchers surrounding construct labeling and collapsing of sub-constructs were reconciled through discussion during the coding process and construct identification among the team members throughout the review.

**Table 1.** Reviewer assignment of the initial database search findings (full article review).

Article Assignment	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4
1-5	X	X	X	
5-10	X	X	X	X
10-15	X			X

15-20	X			
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### 3. RESULTS

Reviews conducted by the research team consisted of a systematic approach to identifying underlying characteristics associated with the implementation of price transparency in United States hospitals. In addition to the JHNEBP study design analysis (coded at the 2-member group level), an article summary, method used, and perspectives/observations are summarized in Table 2. Articles are listed in alphabetical order by the first author's last name, after articles in this paper cited previously.

While it is preferred that research articles with strength of evidence ratings of level I and/or II are utilized in any systematic and/or rapid review, the researchers immediately identified a lack of published research in this segment of the U.S. healthcare industry to-date. This observation is assumed to be the due to the short timeframe between the initial January 1, 2019 CMS price transparency initiatives beginning and the date of the rapid review occurring. As a result, all JHNEBP strength of evidence classifications were included in this study. This decision was made to help ensure an adequate number of articles to review, while also ensuring the inclusion of both qualitative studies and some (5 articles) expert opinions regarding hospital price transparency observations.

**Table 2.** Summary of Findings (n = 20).

Author(s)	*JHNEBP Study Design	Article Summary Statement	Method	Price Transparency Details: Perceptions/Observations
Xiao et al. [3]	4	<ul style="list-style-type: none"> <li>Concerns regarding the use of public chargemasters have been highlighted by a recent analysis assessing pricing transparency for radiation therapy resulting in research of information available to cancer patients at a cancer center.</li> <li>This paper investigated inpatient cancer care service price transparency among multiple health systems' websites.</li> </ul>	<ul style="list-style-type: none"> <li>Researchers conducted a cross-sectional examination of hospital charges for inpatient cancer operations. Hospitals that are not part of the Medicare Inpatient Prospective Payment System were excluded.</li> <li>A descriptive analysis of each center's publicly available chargemaster conducted/reported for inpatient cancer operations/services.</li> </ul>	<ul style="list-style-type: none"> <li>43 out of 52 NCI-designated cancer centers openly disclosed diagnosis-related group (DRG) level charges for at least one inpatient cancer procedure.</li> <li>Across illness areas, the median markup ratio between hospital prices and Medicare reimbursement ranged from 3.73 to 6.57.</li> <li>The markup ratios within illnesses</li> </ul>

				differed greatly between hospitals.
Arvisais-Anhalt et al. [8]	2	<ul style="list-style-type: none"> <li>The goal of this study was to see how hospitals adhered to the norm in a local hospital market where patients would reasonably try to shop for or compare treatments.</li> </ul>	<ul style="list-style-type: none"> <li>Chargemasters for Dallas County hospitals were identified and published on the internet in May of 2019.</li> <li>Multiple specialists reviewed the data independently to confirm that similar tests, drugs, and treatments were all equivalent.</li> <li>Descriptive statistics on charges was conducted, to include comparing hospitals based on their overall rankings of charges in each category assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Thirteen chargemasters in hospitals have been identified and evaluated.</li> <li>A disclaimer describing the restrictions of chargemaster data must be accepted by the user, according to one institution.</li> <li>Eleven hospitals submitted data in an aggregation-friendly format. One of the hospitals that did not give data in an accessible format published their chargemaster as a locked PDF with no way to extract the data (accessibility and usability was of concern).</li> <li>Variability among specific procedure details existed between chargemasters.</li> <li>Variability among true cost data for insured and uninsured patients existed.</li> <li>Limitations and failure of the price</li> </ul>

				transparency initiative cited.
Berkowitz et al. [9]	2	<ul style="list-style-type: none"> <li>• Researchers assessed the availability, usability, and variability of standard reported prices for ophthalmologic procedures at academic hospitals.</li> </ul>	<ul style="list-style-type: none"> <li>• Multicenter economic evaluation study.</li> <li>• Hospital web pages were reviewed for standard charges and usability metrics.</li> <li>• Multiple regression was used to study the geographic influence on standard charges and assess related correlations across/between standard charges of ophthalmologic facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Further attention should be given to the inflated pricing information available to patients.</li> <li>• It was found that the cost difference between geographic areas did not always provide a level of variability that could be easily explained.</li> <li>• A significant number of charges are considered ambiguous when comparing cost between ophthalmology facilities.</li> </ul>
Butler et al. [10]	2	<ul style="list-style-type: none"> <li>• Investigation of consumer pricing data for an elective lumbar discectomy in the United States.</li> <li>• The paper worked to also assess overall availability of data and also how variable it is for patients inquiring about this service.</li> </ul>	<ul style="list-style-type: none"> <li>• Representatives from hospitals were reached out to by phone, hospital websites, and state price transparency websites and under the pretext of a patient asking a self-pay pricing for elective lumbar discectomy, 153 hospitals were contacted via phone calls.</li> <li>• The same hospitals were investigated for price comparisons between those sought by phone and those published on hospital</li> </ul>	<ul style="list-style-type: none"> <li>• Thirty-four of the 148 hospitals studied were able to offer complete price information over the phone.</li> <li>• 70 people were able to receive an offer of half price.</li> <li>• A total of four universities supplied a complete price listing on their websites, while another 65 provided a partial price listing.</li> <li>• When microdiscectomy was available, the average</li> </ul>

			<p>websites. When complete and partial prices were available, they were recorded for both datasets.</p> <ul style="list-style-type: none"> <li>Hospitals were divided into groups based on their profitability, teaching status, and geographic location. The rates of price availability and mean prices were compared between hospital groups and datasets using descriptive statistical analysis.</li> </ul>	<p>total cost was \$27,342.36.</p> <ul style="list-style-type: none"> <li>Private hospitals had much lower partial-prices as compared to government and non-profit hospitals combined.</li> </ul>
Cram et al. [11]	2	<ul style="list-style-type: none"> <li>Discounted cash-pay (cash price) and the minimum negotiated charge at hospitals were investigated using publicly available online pricing information.</li> </ul>	<ul style="list-style-type: none"> <li>Cross-sectional study of 20 <i>U.S. News &amp; World Report</i> (2020-2021) hospital websites to assess price transparency information for two imaging procedures and three hospital services.</li> </ul>	<ul style="list-style-type: none"> <li>At the time of this study, most U.S. hospitals in the hospital listing were not in compliance with the new price transparency rule.</li> <li>Significant variation in pricing existed for the services investigated.</li> <li>It is suggested that potential cost savings for patients may exist due to this study's observations in price differences listed online.</li> </ul>
Eramo [12]	3	<ul style="list-style-type: none"> <li>Organizations are overhauling their financial systems by tracking patient financial responsibility, total cost of care, and negotiated rates more closely, as well as rethinking commodity-service prices.</li> </ul>	<ul style="list-style-type: none"> <li>A Healthcare Financial Management Association (HFMA) strata survey was used to gather information on how hospitals plan to change their financial system in regard to price transparency (n=275 hospitals).</li> </ul>	<ul style="list-style-type: none"> <li>Consumer identification of charge(s) for a procedure is difficult, especially when multiple charges are captured for any single service delivery ("friendly price lookup").</li> </ul>

		<ul style="list-style-type: none"> <li>• Pricing strategy has become an important marketing initiative for hospitals, now being able to see competitors' gross charges.</li> <li>• Prior to publishing, hospitals have a lot of internal steps to complete before being ready to display gross charges.</li> </ul>		<ul style="list-style-type: none"> <li>• Multiple payer rules (contracted rates) are necessary for any type of service, lending additional complication on quoted amounts.</li> <li>• Each patient encounter is so unique – as many patients receiving the same care will still not have the same total of charges based on the online/transparent information publicly available.</li> <li>• The COVID-19 pandemic caused significant distraction from the price transparency initiative.</li> <li>• Respondents are working more closely with operations to impact the total cost of care, approaching to overall pricing has changed (to include some organizations overhauling their chargemaster altogether).</li> <li>• Respondents plan to negotiate rates above current levels for all or certain payers, and some respondents are working more closely with operations to impact the total cost of care.</li> </ul>
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<p>Gondi et al. [13]</p>	<p>3</p>	<ul style="list-style-type: none"> <li>• Compare early compliance with price transparency to the new requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyzed 100 hospitals with the highest gross revenue in 2017 and determined if a machine-readable file with rates and a tool for shoppable services was available.</li> </ul>	<ul style="list-style-type: none"> <li>• 83% of hospitals were noncompliant with at least 1 major requirement and only 52 hospitals offered a price estimator tool for shoppable services.</li> </ul>
<p>Gourevitch, et al. [14]</p>	<p>2</p>	<ul style="list-style-type: none"> <li>• This study attempted to track changes in the patterns and characteristics of pregnant women's use of a price transparency tool over time, as well as the relationship between price transparency tool use, coinsurance, and delivery spending.</li> </ul>	<ul style="list-style-type: none"> <li>• Descriptive cross-sectional study of 2 cohorts used data from a U.S. commercial health insurance company that provided an online price transparency tool (n = 253,606).</li> </ul>	<ul style="list-style-type: none"> <li>• Use of price transparency tools before delivery increased with each cohort.</li> <li>• Searches on the price transparency tool by delivery mode (vaginal or cesarean), timing (first, second, or third trimester), and individual characteristics (age at childbirth, rurality, pregnancy risk status, coinsurance exposure, area educational attainment, and area median household income) were the primary outcomes.</li> <li>• The link between out-of-pocket delivery expenses and the use of price transparency tools. Pregnant patients searched for price information before childbirth using the price transparency web page twice as much as before the tool existed, possibly helping with cost anticipation</li> </ul>

				before/during pregnancy.
Horny et al. [15]	2	<ul style="list-style-type: none"> <li>The study was conducted in order to determine if the new pricing transparency laws are allowing patients to utilize the information given in order to make an informed decision based on price.</li> <li>An important underlying meaning of this study was to assess whether or not publicly disclosed prices provide value to commercially insured patients and their decision process(es).</li> <li>Disclosed hospital reimbursement was usually not correlated with total cost of care, limiting the potential benefits of the hospital price transparency rule for improving consumer decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>Cross-sectional study that used a large database of commercial health insurance claims from 2018.</li> <li>Encounters at U.S. hospitals (November 2020-February 2021) were evaluated.</li> </ul>	<ul style="list-style-type: none"> <li>The allowance of grandfathered plans will not allow those who participate in such plans to take advantage of the benefits that pricing transparency can provide to patients.</li> <li>According to this study, pricing transparency is more of an elusive goal, rather than a functional tool for patients.</li> <li>The study found that price estimates for individual services were estimated, but pricing of an “entire episode of care” was not available.</li> <li>A major part of the lack of transparency is the fact that a majority of the services within a facility are from an independent entity, such as radiology, or surgical services. These services were found to be much more likely to create a financial burden for the patient.</li> </ul>

Hut [16]	4	<ul style="list-style-type: none"> <li>• “Good faith” estimates required to be provided and summarized.</li> <li>• Discussion of both surprise billing and price transparency for patients beginning in 2022 provides details of implementation concerns/initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>• Review/commentary.</li> </ul>	<ul style="list-style-type: none"> <li>• Expected charges for items/services are to be provided within three business days.</li> <li>• Billing and diagnostic codes are also to be provided.</li> <li>• While self-pay patients seem to be the primary initiative with the pricing transparency rule, the same information is supposed to be provided to patients with commercial insurance (but do not intend to submit a claim).</li> </ul>
Jiang et al. [17]	2	<ul style="list-style-type: none"> <li>• General acute care Medicare-certified hospitals in the United States are not in compliance with the Hospital Price Transparency Rule.</li> <li>• Compliance with the policy was correlated with the average of any single hospital’s peer hospitals in the same market.</li> </ul>	<ul style="list-style-type: none"> <li>• Johns Hopkins Bloomberg School of Public Health conducted a cross-sectional observational study of 3,558 Medicare general acute care hospitals.</li> <li>• Compliance with the national Hospital Price Transparency Rule was assessed.</li> <li>• Compliance was coded if the organization publicly posted (online) a file/information that included commercial regulated prices for at least one insurance plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Hospital decisions regarding policy compliance and publicly available information of pricing schedules are often note made in isolation, but rather in coordination with other hospital peers in the same market area.</li> <li>• Those organizations with robust healthcare information technology resources, being for-profit status, and system-affiliated are more likely to be in compliance.</li> <li>• Large, non-urban hospitals were also identified as being in compliance more often than small and/or urban facilities.</li> </ul>

Lawrence et al. [18]	1	<ul style="list-style-type: none"> <li>• A patient care model is used to assess the impact of up-front cost information on the patient's treatment decision(s) when presented with clinically equivalent treatment options for a low-risk pediatric distal radius buckle fracture injury.</li> </ul>	<ul style="list-style-type: none"> <li>• Randomized control trial of patients aged 4-14 years old with the qualifying diagnosis at a hospital-based pediatric orthopedic clinic.</li> <li>• Cost-informed and cost-blind cohorts were established for group differences to be evaluated.</li> </ul>	<ul style="list-style-type: none"> <li>• Price transparency is not suggested to help families decided on treatment decisions related to this diagnosis. Low-risk orthopedic injuries are discussed and related to the study and findings.</li> <li>• Cost was identified as the least influential factor in the treatment decision-making process for both groups involved in the study.</li> </ul>
Lin [19]	3	<ul style="list-style-type: none"> <li>• To describe the characteristics of academic hospitals in the United States (US) that predict price transparency for cataract surgery (CS) and laser posterior capsulotomy (LPC) based on cash and commercial payer-negotiated prices (LPC).</li> </ul>	<ul style="list-style-type: none"> <li>• To establish price transparency, a systematic review of websites for hospitals linked with ophthalmology residency programs was done.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on net income, urban-rural classification, area, hospital beds, or surgical operations, there were no disparities in pricing transparency between CS and LPC.</li> </ul>
Nierengarten [20]	4	<ul style="list-style-type: none"> <li>• About 63% of cancer patients face financial burdens from the costs of their treatment after being diagnosed with cancer.</li> <li>• Financial strain on patients and families experiencing this diagnosis is discussed and price transparency investigated/reviewed.</li> </ul>	<ul style="list-style-type: none"> <li>• Commentary/review.</li> </ul>	<ul style="list-style-type: none"> <li>• In order to make a real impact on the patient's ability to utilize pricing transparency when making health decisions, making it easier for patients to navigate the information will be one of the most important steps.</li> <li>• Only 50% of cancer treatment centers comply with the price transparency regulation, often not disclosing payer-</li> </ul>

				<p>negotiated prices for services.</p> <ul style="list-style-type: none"> <li>• Thyroid cancer patients typically have the highest rates of bankruptcy among all cancer patients.</li> </ul>
Prasad et al. [21]	4	<ul style="list-style-type: none"> <li>• Cancer patients face financial burden due to receiving cancer therapy due to CMS not specifically requiring oncology price inclusion.</li> </ul>	<ul style="list-style-type: none"> <li>• No significant measurement; compared websites for oncology pricing.</li> </ul>	<ul style="list-style-type: none"> <li>• Prices for oncology services varied between institutions and insurers, with less than 15% of hospitals reporting prices for common oncology services.</li> <li>• Specific oncology service pricing was identified via online Google searches and negotiated pricing varied widely, to even include some, “suspicious” values identified in price lists.</li> <li>• Major price variability between institutions and insurers, coupled with a low rate of reporting prices for common oncology services at 15%, suggests that patients with cancer remain vulnerable to potentially harmful price uncertainty despite the adoption of recent price transparency mandates.</li> </ul>

<p>Prasad et al. [22]</p>	<p>2</p>	<ul style="list-style-type: none"> <li>• Intracranial Stereotactic Radiotherapy (SRT) is not included in shoppable price listing, and it is unknown if pricing across institutions is unified.</li> <li>• Utility of publicly available prices for this specific health care service for potential patients was questioned.</li> </ul>	<ul style="list-style-type: none"> <li>• Charge masters for 63 National Cancer Institutes were examined by searching for billing codes and then key words 'Gamma Knife and SRT.'</li> <li>• Obtained data (prices) was then controlled by adjusting for cost-of-living reimbursement differences (geographic cost price index).</li> <li>• Pairwise comparisons were conducted to compare prices across modalities and geographic regions. Price association between modalities and relationships with cost index were examined using Spearman correlations.</li> </ul>	<ul style="list-style-type: none"> <li>• No adjusted difference in price was noted between regions in this study.</li> <li>• Institutional prices varied but cost of living does not affect the variability.</li> <li>• Overall, institutional prices varied significantly, but differences in cost of living do not explain variability for the SRT service.</li> <li>• Therapy-related economics distress in these patients is warranted to additional fees and other facility-based charges not provided in transparent pricing data. A further policy change/update is recommended.</li> </ul>
<p>Reddy &amp; Duffy [23]</p>	<p>3</p>	<ul style="list-style-type: none"> <li>• The purpose of the article was to explain the No Surprises Act and the need for the federal government to get involved.</li> <li>• The main premise of the article supports transparency of healthcare services pricing in an industry that has demonstrated, "marketing failure" with regarding to out-of-network services provided to the uninformed patient at the time of care.</li> </ul>	<ul style="list-style-type: none"> <li>• Commentary on surprise billing and related healthcare organization price transparency/clarify of patient financial responsibilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Summary and initiatives of the No Surprises Act (January 2022) is provided, citing a dispute for surprise bills received after care delivery.</li> <li>• Protection offered for lack of price transparency of out-of-network provider care, limiting their ability to balance bill a patient.</li> <li>• Cost data is to be provided to patients from both payers and providers for potential services (ahead of time).</li> </ul>

				<ul style="list-style-type: none"> <li>Act could reduce commercial insurance premiums by 0.5 to 1%.</li> </ul>
Repka [24]	4	<ul style="list-style-type: none"> <li>Accurate pricing information for hospital services has not been publicly available until recently and even then, finding the information and a complete list of charges is difficult for specific types of eye surgeries.</li> </ul>	<ul style="list-style-type: none"> <li>24/7 academic medical centers were observed to see which ones were abiding by the transparency rule meaning that all their price listings were complete as well as clarity being shown on what services and items were included in the listed price.</li> </ul>	<ul style="list-style-type: none"> <li>Only a fourth of the medical centers included the cost of physician services, in addition to this many of the websites, were difficult to navigate and especially hard to find information for certain payment methods.</li> <li>It is strongly suggested that uninsured patients require actual discounted cash-pay pricing and insured patients require payer-specific pricing.</li> </ul>
Takvorian et al. [25]	2	<ul style="list-style-type: none"> <li>The purpose of this article was to identify the pricing for cancer treatment at various types of hospitals and to examine the differences in spending and utilization for patients with private or commercial insurance.</li> </ul>	<ul style="list-style-type: none"> <li>Retrospective, cross-sectional study of adult patients with an incident diagnosis of breast, colon, or lung cancer and had surgery from 2011 to 2014.</li> <li>Data from major national commercial cancer treatment claims was collected and examined and compared between National Cancer Centers and community hospitals.</li> <li>Mean risk-adjusted spending and utilization outcomes were examined for each hospital type using multilevel generalized</li> </ul>	<ul style="list-style-type: none"> <li>When compared to community hospitals, treatment at National Cancer Institute centers was associated with higher surgery-specific insurer prices paid without differences in care utilization.</li> <li>No significant difference in length-of-stay, emergency department access/utilization was observed.</li> <li>The article recommends additional research into the organization's prices and costs related to</li> </ul>

			linear mixed-effects models, adjusting for patient, hospital, and region characteristics.	these cancer treatments.
Xiao & Rathi [26]	3	<ul style="list-style-type: none"> <li>To identify price transparency with COVID-19 testing in response to the pandemic and the CARES act.</li> </ul>	<ul style="list-style-type: none"> <li>A cross-sectional study of online COVID-19 test price transparency at major US hospitals was conducted. The following information about in vitro COVID-19 tests was systematically evaluated on the public websites of all hospitals on the 2019–2020 U.S. News &amp; World Report "Best Regional Hospitals" list: cash pricing, hospital charges, and test type.</li> </ul>	<ul style="list-style-type: none"> <li>A third of hospitals published cash fees for in vitro COVID-19 testing, 32.0 percent only mentioned hospital charges, and 36.0 percent did not provide pricing information.</li> </ul>

\* Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) levels of strength of evidence: Level 1, experimental study/randomized control trial (RCT); Level 2, quasi-experimental study; Level 3, non-experimental, qualitative, or meta-synthesis study; Level 4, opinion of nationally recognized experts based on research evidence/consensus panels; Level 5, opinions of industry experts not based on research evidence.

### 3.1 Risk of Bias

JHNEBP quality indicators were assigned to each article by the research team during the rapid review process. A majority of the articles were classified as quasi-experimental (Level II), while half of the articles identified in the review were classified as either non-experimental (Level III) and opinion of nationally recognized experts based on research evidence/consensus panels (Level IV). The inclusion of articles classified with strength of evidence Level IV was decided upon as it added to the quality of the review and identified, underlying constructs. There were no articles classified as Level V in the search. A summary of quality assessments for the identified articles is shown in Table 3.

Underlying constructs related to price transparency perceptions and observations by and/all healthcare stakeholders were identified by the research team. The

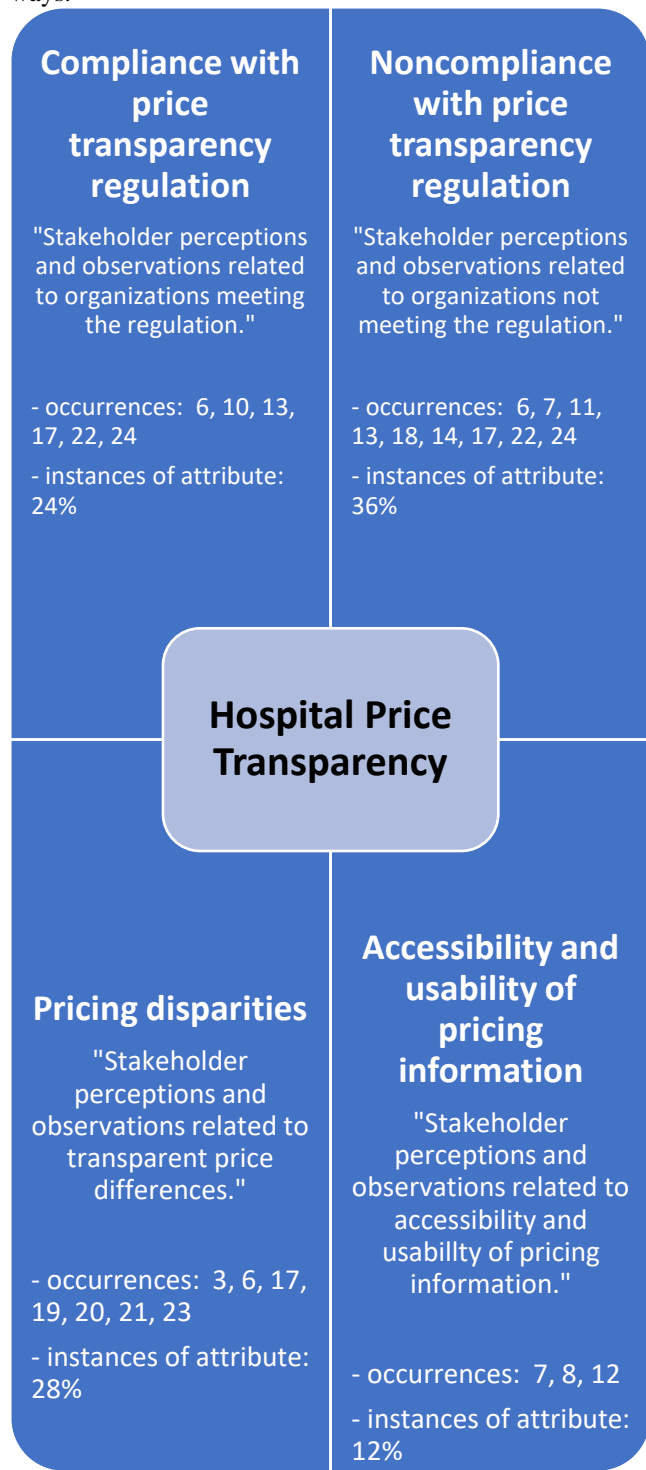
**Table 3.** Summary of Quality Assessments

Strength of Evidence	Frequency
I (Experimental/RCT)	1 (5%)
II (Quasi-experimental)	9 (45%)
III (Non-experimental, qualitative)	5 (25%)
IV (Opinion of nationally recognized experts based on research evidence/consensus panels)	5 (25%)
V (Opinions of industry experts not based on research evidence)	0 (0%)

constructs are identified with meta-data shown in Figure 3. These constructs are demonstrated to overlap, with multiple articles from the review supporting more than one underlying



construct. This lack of construct exclusivity demonstrates the ability of price transparency initiatives to be perceived/observed by healthcare stakeholders in multiple ways.



**Figure 3.** Occurrences of hospital price transparency underlying themes identified as observed in the literature.

The most evident underlying construct in this review was hospital non-compliance with the CMS price transparency regulation requirements (instances of attribute = 36%). Pricing disparities was the next prevalent construct identified in the rapid review (instances of attribute = 28%), with price differences identified and related to both between and within hospital chargemaster disparities. 24% of the articles identified discussed successful (partial and/or complete) implementation of price transparency initiatives as perceived by various healthcare stakeholders. Finally, several articles also focused on healthcare stakeholders' perceptions and observations surrounding accessibility and usability of pricing information (12%).

#### 4. DISCUSSION

##### 4.1. Disparities in pricing and implications

The identified construct of price disparities [3, 22, 23] is most often associated with healthcare consumers' initial assessment of the healthcare organization's posted chargemasters. In addition to healthcare stakeholders experiencing prices posted not always matching what is later billed, additional price disparities were discovered by the research team in the literature. Patient care online procedure shopping and many who have undergone treatment afterward cite additional variables confounding the validity and reliability of price transparency, supporting the 28% instances of attribute in Figure 3:

- Between organization pricing differences for the same procedure [8, 22]
- Listing of Medicare allowables in lieu of gross charges [3, 19, 21]
- Significant confusion regarding individual patient commercial insurance plans (i.e. coinsurance, deductible amounts, etc) and patient responsibility as compared to insurance coverage amounts [15, 19]

Implications related to these pricing disparities can be significant, especially for those patients who have shopped online for a procedure and then received care from the facility with the pricing listing online. Playing into the surprise billing dilemma that continues to be experienced in the U.S., patients are often ignorant as to how government payers (Medicare and Medicaid), commercial fee schedules (allowable rates of reimbursement), and even private pay (cash) charges are set by the healthcare organization [3]. In the end, where the price transparency initiative continues to work on providing more pricing information to assist the public in having more financial information regarding their upcoming procedures – identifying a procedure value online and using that information to influence a decision regarding if, where, and when to receive care can be even more of a detrimental patient experience if incorrect. Often, this experience occurs only after the care has been delivered and the patient has assumed financial responsibility, regardless of their payment method.

#### 4.2. Accessibility and usability of pricing information

Providing hospital pricing information online and in public view is not a common practice that has occurred in the past (prior to 2019) and is therefore a new experience for many healthcare organization leaders to comprehend and implement [24]. Besides complicated commercial health insurance coverage plans and related patient cost-sharing methods (i.e. deductibles, copayments, coinsurance rates, etc), patients shopping online have also experienced basic access issues to pricing information [24]. Primary concerns with this identified construct in the review are simply related to online website accessibility concerns – and related data extracted at the user-level.

Often, hospital websites use the industry's language, of which most patients do not understand and therefore making health literacy of issue in the price transparency initiative. For instance, of a healthcare organization uses diagnosis-related groups (DRG) or Current Procedural Terminology (CPT) codes to label their procedures in online fee schedules, such code information may not be readily available to the common layperson [9, 12, 14]. While the code entered/searched by the patient prior to the procedure occurring may be located, it may not be the code eventually assigned to the actual care provided when complete [12, 24]. Further, the procedure name itself may possess multiple terms and/or word variances that can easily be confused or incorrect during the patient's online shopping experience.

#### 4.3 Compliance and noncompliance with price transparency regulations

Composing 60% of the instances of attribute identified in the review (Figure 3), assessment of compliance (and therein noncompliance) with the CMS price transparency initiative provides insight into the hospital industry's efforts to-date. A fairly new requirement, it should be again mentioned that CMS just recently began initiatives to provide price transparency in the hospital industry (2019), with future policy initiatives planned as well (2023 and 2024). Also important to cite, as identified in the literature by the review team, the COVID-19 pandemic has consumed hospital leadership priorities, time, and resources, significantly distracting from the price transparency initiative [12].

There are hospitals in the U.S. that have decided to simply not comply with the initiative, therefore providing no pricing information in the public realm for access and support in the initiative [15]. While some hospitals instead offer a pricing estimator tool for healthcare stakeholders to use and provide some insight into the potential costs related to care, only about 50% of hospitals use this online resource [13]. Hospitals not providing price transparency today are noncompliant with the CMS price transparency regulation [8, 9, 24, 26].

Compliance with the CMS pricing initiative is specifically defined as the healthcare organization providing a publicly accessible (often online) machine-readable file that contains commercially negotiated prices for at least one health insurance plan [17]. The research team identified several studies that yielded a wide range of facilities found to be compliant with price transparency initiatives that meet this expectation. Often, the type of facility (for example: general vs. specialty hospital, hospital vs. physician services) also demonstrated various price transparency compliance results. Compliance also means that hospitals must provide a list of items that can be billed for medical services, along with the physicians that perform the specific services [19]. For instance, it was identified in one study that an estimated 25% of physician (professional) services were following price transparency regulations [24], while alternatively – another study identified up to 50% of hospitals not in compliance [8]. Another article cited up to 83% of hospitals in their study non-compliant [13].

The research team identified several articles citing oncology specialty hospitals and significant variation in compliance with the initiative. While one study identified 43 of 52 cancer organizations (est. 83%) in compliance and meeting the CMS regulations [3], another identified only 50% of oncology facilities successfully in-compliance [20]. Additionally, another study cited only 15% of cancer facilities in-compliance and appropriately posting pricing information [21]. While price transparency could be improved for all hospitals and healthcare organizations in the U.S., a standardization of charges and use of a single pricing benchmark to use to a better apples-to-apples comparison would yield the best price comparison tool for healthcare stakeholders [8].

## 5. STUDY LIMITATIONS

As with any review, this study possesses limitations. This was a convenience sample taken from articles focused on hospitals in the U.S. only to provide an assessment of perceptions and observations to-date surrounding the CMS hospital price transparency regulation for Medicare and/or Medicaid participating organizations. As a result, non-U.S. hospitals were not evaluated, as not applicable to this measure. However, as the U.S. and CMS continue to pursue this initiative, other countries may observe best practices of hospitals in their journey to meet this initiative and satisfy healthcare consumer needs of price transparency.

## 6. CONCLUSIONS

Healthcare stakeholders deserve to know how much financial responsibility they will incur prior to receiving care at U.S. hospitals, as well as any/all healthcare organizations in addition to hospitals. CMS has initiated an attempt to alleviate healthcare consumer price concerns with U.S. hospitals. While still in the implementation stage and additional policy requirements forthcoming by CMS, the U.S. healthcare system has a long way to go to meet healthcare

consumer expectations. The literature identified in this rapid review has provided mixed results regarding interpretation of compliance and reasons thereof regarding price transparency initiatives. Maintaining the distinction between charge (price) of care and cost of care (for the healthcare organization), other countries may benefit from observing healthcare stakeholders' perceptions and observations related to ongoing U.S. price transparency initiatives.

This rapid review focused on identified, overarching themes related to price transparency constructs identified in the literature. Follow-on studies could build upon identified rapid review themes, possibly identifying additional constructs in the literature as ongoing research is available for inclusion. Expanding sample size of healthcare organizations analyzed, as well as delineating between hospital types (rural/urban, geographic location, specialty/general facility type, size of facility, and identification of critical access facilities) would add significant details in the implementation and interpretation of compliance across all U.S. hospital types. Further, associated professional services needs to also be assessed, as many hospital procedures and related diagnostic services are highly codependent upon physician services – which is highly influential in causing surprise billing issues after the fact.

Future research should further focus on the potential standardization of publicly displayed hospital fee schedules, methods to better end-user interpretation and use of such data, and the information deduced from hospital websites. The research team suggests that health literacy issues, to include information processing and even assessment of source levels of trust [27, 28], at the patient-level confound anticipated results of the price transparency initiative and methods to alleviate this dilemma are warranted. Important to note – instances of U.S. hospitals choosing to not comply with price transparency regulations or otherwise not disclosing privately negotiated rates are also becoming more evident and require further investigation [29]. Finally, policy makers and healthcare leaders should continue to encourage price transparency in the U.S. healthcare system to help alleviate potential surprise billing issues, while also educating the public on other important health care decision variables besides the estimated cost of care.

#### **AUTHOR CONTRIBUTIONS**

All the authors contributed to this review in accordance with ICMJE standards as part of a graduate health care management degree program's curriculum. The corresponding author C.L. (Cristian Lieneck) provided leadership and guidance in the review process, to include participation in topic investigation and overall administration of the research team. Additional duties also included facilitation of the method, team supervision, and significant contributions to the writing of the manuscript (both draft and final edits). All other authors contributed to investigation into the research topic, participation in the method, and original

drafting of the manuscript. All authors have read and agreed to the published version of the manuscript.

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#### **CONFLICTS OF INTEREST**

The authors declare no conflict of interest.

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