



Issue Brief

Reference Pricing, Consumer Cost-Sharing, and Insurer Spending for Computed Tomography (CT) Scans

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The computed tomography (CT) scan findings in this brief derive from a series of studies on the impacts of reference pricing, conducted at the UC Berkeley Center for Health Technology (BCHT). Data for these health insurance studies were obtained from large self-insured employers and employer associations: the California Public Employees Retirement System (CalPERS), Safeway, and the RETA Trust.

All studies compare changes in consumer choice and provider prices before and after implementation of reference pricing, and compare these changes to the choices made by comparable employed groups not subject to reference pricing. This research method is referred to as 'difference-in-differences' multivariable statistical analyses. Comparison group data were obtained from health insurance provider Anthem, Inc. and pharmacy benefit manager Envision Rx. Full information on the reference pricing studies can be obtained from the BCHT website, bcht.berkeley.edu.

Methods

In November of 2011, Safeway, a national chain of retail grocery stores and food-processing factories in the U.S., implemented reference pricing for imaging services for its self-insured health plan. Unionized employees governed by collective bargaining contracts negotiated before the development of reference pricing were excluded.

Additionally, reference pricing was only applied in non-emergency situations, when the patient had the ability to shop among alternative providers. Patients were permitted to use high-priced providers without extra charge if their physicians indicated clinical reasons or if the patient did not have reasonable geographic access to a low-priced alternative.

Safeway established a maximum reimbursable amount for CT scans at approximately the 60th percentile of the distribution of prices in 2010. Safeway employees were given access to an online price transparency tool developed by Castlight Health, which presents the allowed charge and the expected patient cost-sharing for different providers.

The problem: price variation

Prices charged for similar health care services often vary dramatically within and across local communities. This variation results from a combination of low price sensitivity on the part of patients, due to generous insurance coverage, and high pricing power by providers, due to increasing market consolidation.

The large variation in prices paid raises concerns about clinical appropriateness, given the financial incentives facing the hospitals and ambulatory facilities that administer imaging tests. Studies have found rates of use for imaging procedures to be higher on the part of physicians who own imaging equipment and hence receive the facility as well as professional fee for the procedure, compared with those who only receive the professional fee. The emergence of providers' financial incentives and subsequent growth in volume has focused insurers' attention on the prices paid for these and other tests.

A partial solution: reference pricing

To counter this price variation, some large self-insured employers have developed reference pricing, an insurance benefit design that encourages employees to favor providers charging low prices for non-emergency "shoppable" services. Reference pricing can pair with price transparency and supplement or substitute for annual deductibles. The long term goal is to change the incentives facing providers, motivating them to compete based on price as well as quality, and to pursue cost reducing innovations in the design of their services.

Under reference pricing, the employer or insurer establishes a limit on what it will contribute towards a particular service, with the enrollee required to pay the remainder. That contribution is normally set near the median of the distribution of prices in the local market, allowing for full coverage at cost effective providers and partial coverage at more expensive providers.

Employees retain the ability to select their own physician and facility and receive full coverage if they use one that charges less than the reference price limit. It is only when the employee selects a higher priced physician or facility that they must pay the difference between the reference limit and the price charged. Reference pricing has been shown to induce significant shifts in consumer choices toward lower-priced providers for inpatient surgery, ambulatory surgery, and clinical laboratories in the United States.



CT scan of lungs

Data & Analysis

Claims data on type, volume, place of service and price of CT scans were obtained for employees of Safeway. For comparison, claims data were obtained for enrollees in Anthem Blue Cross Blue Shield who underwent CT scans during the same period. The data extended from January 2010 through December 2013.

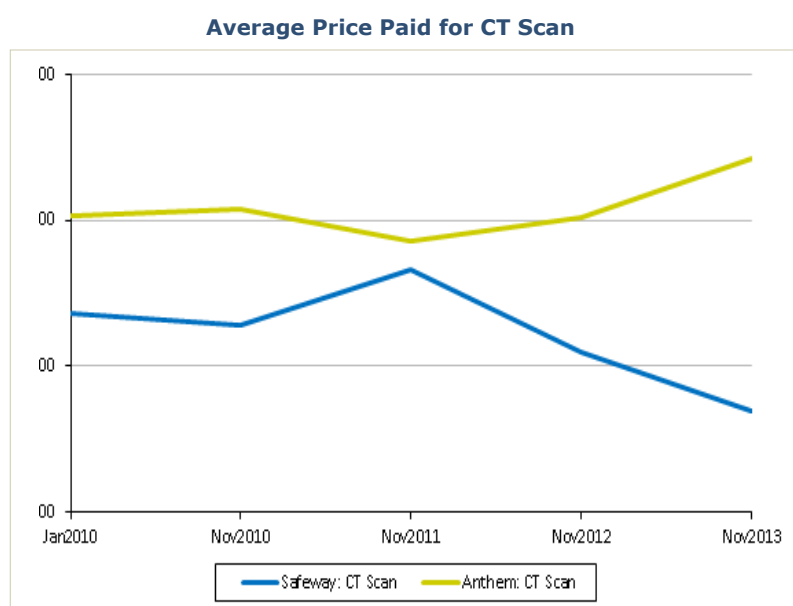
Patient demographics included age, sex and 3-digit zip code. Patients eligible for Medicare were excluded. The price data included the paid amount, or allowed charge; and separately, the amounts paid by both the employer and patient.

Four endpoints were used in the analysis. The first measured the extent to which Safeway employees selected providers that charged less than or equal to the reference price. The second measured the total price paid, or allowed charge, to the facility. The third endpoint was the amount paid for the test by the patient under cost-sharing obligations. The fourth was the amount paid by Safeway or Anthem for patients not subject to reference pricing.

After adjusting for characteristics of the tests and patients, the association between reference pricing and the four endpoints was analyzed using difference-in-difference multivariable regression analysis, where the change over time for the Safeway treatment group and the Anthem comparison group were computed with respect to each endpoint.

Table 1: 2010 Distribution of Prices Paid by Safeway and Price Paid by Medicare: 5 CT Scans Most Commonly Used by Safeway Employees

Imaging Procedure	Percentile					Medicare
	5th	25th	50th	75th	95th	
CT maxillofacial wo dye (CPT 70486)	\$109	\$318	\$376	\$455	\$1039	\$195
CT pelvis wo dye (CPT 72192)	\$77	\$192	\$355	\$412	\$614	\$195
CT pelvis w dye (CPT 72193)	\$68	\$190	\$362	\$506	\$979	\$297
CT abdomen w dye (CPT 74160)	\$75	\$244	\$418	\$664	\$1241	\$297
CT abdomen wo&w dye (CPT 74170)	\$127	\$394	\$473	\$598	\$1904	\$333

Figure 1: Average prices paid for CT Scans before and after implementation of reference pricing in November 2011

Findings

Substantial variation in price paid for CT scans

The price paid for the 5 CT scans most commonly used by Safeway employees varies remarkably.

Table 1 shows the distribution of prices paid. There is a 10-fold difference between the 5th and 95th percentiles in each test's price distribution. For example, prices paid for a CT scan of the abdomen with dye ranged from \$75 to \$1,241 even after trimming the minimum and maximum outliers. By way of comparison, the national average Medicare payment for this test in 2010 was \$297, around the 25th percentile in the price distribution for Safeway. This variation in price motivated Safeway to implement reference pricing.

Spending decreased following implementation of reference pricing

As shown in Figure 1, before the implementation of reference pricing in November of 2011, the prices paid by Safeway were increasing slightly for CT scans. After implementation, prices declined sharply. By way of contrast, prices paid by Anthem increased in the years after Safeway implemented reference pricing, leading to a growing divergence between the two groups' prices.

Implementation changed patients' choice of provider

After controlling for the experiences of Anthem enrollees, the implementation of reference pricing for Safeway was associated with minor changes in market shares. As seen in Figure 2 reference pricing had no observed impact on the

probability of a Safeway employee selecting a high price facility in the first full year after implementation. But by the second year (2013), it was associated with a 9.3% reduction.

Implementation reduced the price paid by Safeway

Reference pricing did not exert a significant impact on prices until the second full year after implementation, where it was associated with an \$66 (12.5%) reduction in prices (*Figure 3*). During these same years, the average price paid by Anthem, which did not implement reference pricing, increased from \$505 to \$515. It should be emphasized that these reductions in prices paid by Safeway stem from changes in the facility choices made by employees, rather than from changes in the prices charged by any particular facility.

Implementation reduced customer cost-sharing

Prior to implementation of reference pricing, Safeway employees paid out-of-pocket an average of \$54 more per test than did Anthem enrollees. Even though cost-sharing for CT scans was rising during the 2010-2013 period, reference pricing counteracted this trend. Reference pricing was associated with a reduction in out-of-pocket spending by consumers from an average of \$164 for CT scans in 2011 to \$136 in 2013. Over the same period, out-of-pocket spending for the Anthem comparison population increased from \$99 to \$115.

Reference pricing saved money for both the employee and employer

Reductions in prices in 2012 and 2013 resulted in a total savings of \$19,337. Savings accrued

Figure 2: Association between Implementation of Reference Pricing and Patient Choice of Facility, 2010-2013

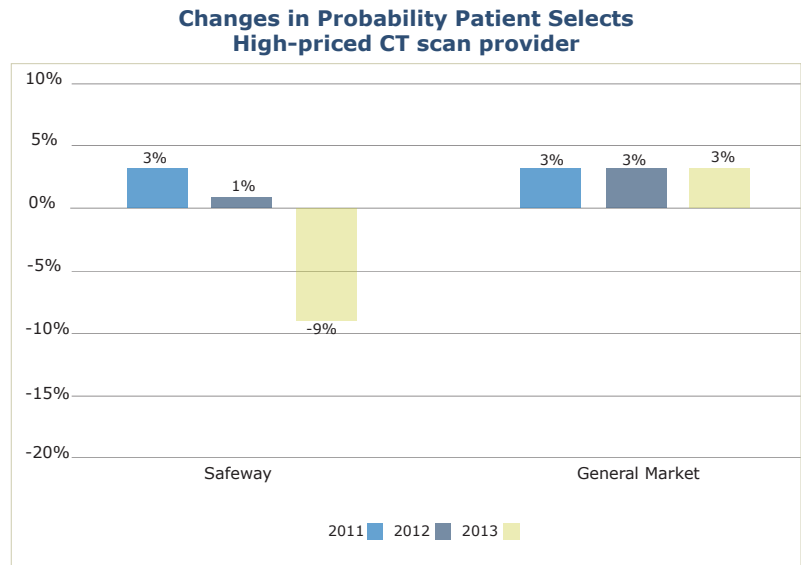
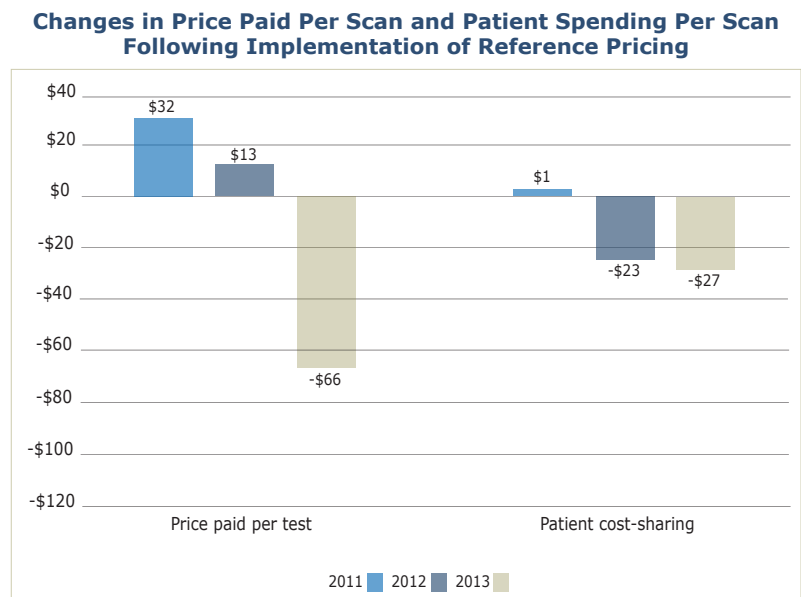


Figure 3: Association Between Implementation of Reference Pricing and Test Prices and Patient Cost-Sharing for CT Scans, 2010-2013



by Safeway itself amounted to \$4,282 (22.1%) and to its employees amounted to \$15,055 (77.9%).

Conclusion

Implementation of reference pricing led to changes in consumer choices and to savings for both Safeway and its employees. Consumers shifted to facilities charging lower prices, and the average price paid for an CT scan decreased by 22.3 percent. Reference pricing reduced employee cost-sharing as well.

Reference pricing does not address all issues facing the health care system. It targets prices, not utilization, and neither reduces demand for inappropriate services nor increases adherence to appropriate alternatives. It is limited in scope to acute episodes of care and

necessitates patient access to information regarding price and quality. Reference pricing adds to the complexity of the choices already facing consumers.

Despite the limitations of reference pricing, Safeway successfully lowered spending by double-digit percentages. Few other purchaser strategies have such potential. Because price is an easily understood metric for patients, compared to quality and clinical appropriateness, reference pricing can change the way consumers view health care, creating a culture of engagement, cost comparison and informed choices. The experience of shopping for price may stimulate patients subsequently to compare providers across all dimensions of performance, and take them a step further on the journey towards value-based health care.

Robinson JC, Whaley C, Brown TT, Reference Pricing, Consumer Cost-Sharing, and Insurer Spending for Advanced Imaging Tests. Med Care. 2016 Dec;54(12):1050-1055.



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