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Out-of-Network Facility Charges for Patients Undergoing Outpatient Total Joint Arthroplasty

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ABSTRACT

Background: The utilization of outpatient (OP) total joint arthroplasty (TJA) is increasing. Although many arthroplasty surgeons and hospitals have longstanding agreements with insurance companies, it may take time for ambulatory surgery centers (ASCs) to establish in-network agreements. The purposes of this study are to investigate trends in out-of-network facility charges for OP-TJA, as well as compare rates of out-of-network facilities between ASC and hospital outpatient department (HOPD) OP-TJA.

Methods: This is a retrospective study of the MarketScan commercial claims database of OP-TJAs (same-day discharge) performed at ASCs or HOPDs from 2007 to 2017. Detailed demographic, geographic, operative, insurance, temporal, and financial details were collected. Out-of-network facility utilization was trended over time. Adjusted regressions compared the prevalence of out-of-network facilities between ASCs and HOPDs.

Results: There were 13,031 OP-TJA patients (58.8% total knee arthroplasty). Utilization of out-of-network facilities significantly decreased over time, from 27.8% of surgeries in 2007 to 9.5% in 2017 ($P_{\text{trend}} < .001$); however, this was non-linear with a significant increase in 2013–2015 corresponding to rising use of out-of-network ASCs. Patients treated at ASCs were significantly more likely to be out-of-network than those treated at HOPDs (odds ratio 4.88, 95% confidence interval 4.28–5.57, $P < .001$; odds ratio 7.70, 95% confidence interval 6.42–9.25, $P < .001$ among the 11,870 patients with in-network surgeons). About 10.4% of patients with in-network surgeons were treated at out-of-network facilities.

Conclusion: Although the utilization of out-of-network facilities has decreased, over 10% of patients with in-network surgeons face out-of-network facility charges, which may often come as a surprise. Efforts are warranted to reduce the out-of-network facility burden for OP-TJA patients, including accelerating insurance contracting and reviewing patients' coverage statuses.

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Total joint arthroplasty (TJA) is one of the most successful procedures in medicine [1]. However, owing to the large burden of degenerative joint disease, TJA is one of the leading healthcare expenditures in the United States, creating pressure to further increase the value (ie, outcomes per dollar spent) of this procedure

[2]. Although traditionally an inpatient-only procedure, there is a growing body of evidence that, in properly selected patients, outpatient (OP; ie, same-day discharge) TJA can achieve similar or superior outcomes to inpatient TJA at lower costs, thus potentially improving both aspects of healthcare value [3–13]. As such, there is great interest in optimizing this procedure as quickly as possible from patients, surgeons, and payers alike [13–15].

To date, there has been significant interest in the financial impact of transitioning to an OP-TJA model for payers and providers [15–20]. Studies have demonstrated significant savings in total episode costs for patients undergoing OP-TJA in both commercially insured and Medicare populations [15–18], though reductions in Medicare reimbursement have exceeded reductions in hospitals costs (ie, reductions have come partly at hospitals' expense) [15,18].

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Additionally, due to the potential cost-savings from the reduced overhead associated with free-standing ambulatory surgery centers (ASCs) compared to full hospitals [16,17], there has been an explosion in the number of ASCs performing OP-TJA. According to the Ambulatory Surgery Center Association, the number of ASCs performing TJAs increased more than 700% from 2013 to 2017 [21]. Early data on whether ASCs save additional money compared to hospital outpatient departments (HOPDs) for TJA have been uncertain [19,20].

In contrast to providers and payers, there has been comparatively little focus on the financial impact of this transition on patients. Given that developing contracts with insurance companies typically takes time, the rapid anecdotal growth of ASCs could lead to a large number of patients undergoing surgery at out-of-network facilities, which can cause substantial financial burden [22–24]. Even when patients see surgeons who are in-network, it is possible that the facility may be creating the potential for surprise out-of-network charges. Therefore, the purposes of this study are to: (1) assess trends in the relative utilization of ASC vs HOPD OP-TJA, (2) assess trends in the utilization of out-of-network facilities for OP-TJA, and (3) compare the risk of out-of-network charges between ASCs and HOPDs.

Methods

This is a retrospective review of patients undergoing OP-TJA at either an HOPD or ASC in the IBM MarketScan Commercial Claims and Encounters Database from 2007 to 2017. The database provides detailed, patient-specific data on all inpatient and outpatient professional, facility, and prescription drug charges for over 50 million patients from 350+ payers nationwide each year. The MarketScan database is widely considered to be one of the largest, most-comprehensive national databases in the United States due to its highly granular, longitudinal data on charge source, charge amount, provider specialty or facility type, and location. It has been used extensively in the health policy literature, including to study out-of-network medical bills [25].

We queried the database for all patients undergoing OP (same-day discharge) total knee arthroplasty (TKA) and total hip arthroplasty (THA) for osteoarthritis using Common Procedural Terminology (27447 and 27130) and International Classification of Diseases 9th and 10th edition codes (715.* and M15.*-M19.*). For each patient, detailed information on patient medical, surgical, temporal, and financial variables was collected. Demographic variables included age, gender, geographic region, and year. Surgical variables included surgery type, indication, and date, while facility information included facility type (ie, ASC vs HOPD).

All charges associated with the index episode were recorded, including charge amount, source, and in/out-of-network status. Consistent with prior studies [26,27], we identified a patient's primary surgeon using procedure modifier codes, which are included in the database. If a patient had multiple primary surgeons, we classified the surgeon with the highest associated charge as the primary surgeon [27]. Similarly, to identify whether the primary facility was either in or out-of-network, we identified the highest facility charge associated with the procedure. Similar to prior work [26,27], we limited our sample to patients for whom both primary facility and surgeon network status were available.

Our primary outcomes were the trends in the relative utilization of ASCs and HOPDs, as well as the proportion of OP-TJAs performed at out-of-network facilities over time. We explored trends in out-of-network facilities overall, as well as when segregating by facility type (ie, HOPD vs ASC). We also examined these trends when limiting our sample just to patients who underwent surgery with an in-network surgeon (as an out-of-network facility charge may

Table 1
Patient Demographics Overall and Segregated by Hospital Setting.

Characteristic	Surgical Setting			P-Value
	ASC (n = 7139)	HOPD (n = 5892)	Total (N = 13,031)	
Age (y)				
Mean (SD)	55.8 (6.5)	55.6 (7.6)	55.7 (7.0)	.06
18–34	57 (0.8%)	95 (1.6%)	152 (1.2%)	
35–44	364 (5.1%)	280 (4.8%)	644 (5.0%)	
45–54	2077 (29.1%)	1635 (27.9%)	3712 (28.6%)	
55–65	4636 (65.0%)	3852 (65.7%)	8488 (65.3%)	
Gender				
Female	3656 (51.2%)	3029 (51.4%)	6685 (51.3%)	.82
Male	3483 (48.8%)	2863 (48.6%)	6346 (48.7%)	
Region				
North Central	2702 (37.8%)	2205 (37.4%)	4907 (37.7%)	<.001
Northeast	219 (3.1%)	543 (9.2%)	762 (5.8%)	
South	2522 (35.3%)	2099 (35.6%)	4621 (35.5%)	
Unknown	17 (0.2%)	73 (1.2%)	90 (0.7%)	
West	1679 (23.5%)	972 (16.5%)	2651 (20.3%)	
Surgery				
THA	3222 (45.1%)	2150 (36.5%)	5372 (41.2%)	<.001
TKA	3917 (54.9%)	3742 (63.5%)	7659 (58.8%)	

ASC, ambulatory surgery center; HOPD, hospital outpatient department; SD, standard deviation; THA, total hip arthroplasty; TKA, total knee arthroplasty.

have been more likely to be a surprise for these patients compared to when a patient may have knowingly sought out treatment from an out-of-network surgeon). As a secondary outcome, we calculated the estimated potential balance bill related to these out-of-network facility charges as the total out-of-network charges less the standardized payment (ie, the typical in-network price) [23,27,28]. Patients receive balance bills when out-of-network healthcare providers are paid less by insurance companies than what they charged and send patients a bill for this balance [25].

Statistics

Unadjusted continuous variables were compared with *t*-tests, while unadjusted categorical variables were compared with chi-squared tests. Rates of out-of-network facility charges were trended over time with Cochran-Armitage trend tests. Logistic regressions controlling for age, gender, surgery, year, and region were used to compare the odds of being treated at an out-of-network between ASC and HOPD TJA. All payments were adjusted to 2017 United States dollars using the US Department of Labor Statistics consumer price index calculator [29]. Mean estimated balance bill amount was adjusted for procedure, year, region, and facility type with linear regression. All statistics were performed in SAS v9.4 (SAS Institute, Cary, NC). As this study contained only de-identified, Health Insurance Portability and Accountability Act-compliant data, it was exempt from Institutional Review Board approval. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Results

We identified a total of 13,031 patients undergoing OP TKA or THA (Table 1). The mean (standard deviation) age was 55.7 (7.0) years and 6685 (51.3%) patients were women. Overall, 5892 patients underwent surgery at an HOPD (45.2%) and 7139 (54.8%) were treated at an ASC. Patients in this study were significantly more likely to be treated at ASCs in the West, while patients in this study were significantly more likely to be treated at HOPDs in the Northeast ($P < .001$). Additionally, 60% of all THAs were treated at ASCs, while 51.1% of TKAs were treated at ASCs ($P < .001$ for both). TKA was the more commonly performed procedure in both

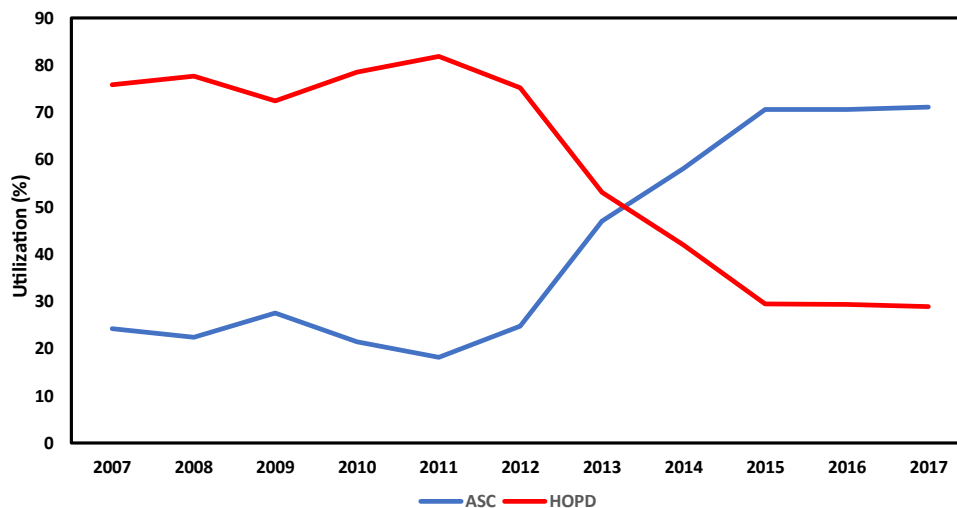


Fig. 1. Utilization of ASCs vs HOPDs in performing total joint arthroplasty from 2007 to 2017. ASC, ambulatory surgery center; HOPD, hospital outpatient department.

locations, representing 63.5% of all surgeries at HOPDs compared to 54.9% of all surgeries at ASCs.

Notably, both OP-TJAs and relative utilization of ASCs became significantly more common across the study period. There were 364 patients who underwent OP-TJA in 2007 compared to 3373 in 2017, an 827% increase within the database. With respect to the relative utilization of ASCs vs HOPDs, ASCs comprised only 24.2% of all surgeries in 2007 compared to 71.1% in 2017 ($P_{\text{trend}} < .001$; Fig. 1). From 2007 (24.2%) to 2012 (24.8%), the relative utilization of ASCs vs HOPDs was mostly stable with a peak of 27.6% of surgeries in 2009 and trough of 18.1% of surgeries in 2011 ($P_{\text{trend}} < .41$; Fig. 1). Starting in 2013, however, there was a rapid rise in the relative utilization of ASCs, jumping to 47.0% of surgeries in 2013, 58.1% in 2014, before stabilizing at approximately 71% from 2015 to 2017.

Out-of-network facilities became less common during the study period, as they were used for 27.8% of surgeries in 2007 compared to 9.5% in 2017 ($P_{\text{trend}} < .001$; Fig. 2). Critically, however, this was also a 2-step trend. Namely, out-of-network facility charges fell nearly each year from 2007 (27.8%) to 2012 (5.6%) ($P_{\text{trend}} < .001$), before experiencing a significant increase in 2013 (20.8%) and 2014 (27.5%) and then decreasing again in 2015 (20.0%), 2016 (13.7%), and 2017 (9.5%). When limiting the sample to the 11,870 patients who were treated by in-network surgeons—suggesting an out-of-network facility charge may have come as a surprise to the patient—the relative differences were even more dramatic. Among patients being treated by in-network surgeons, there was a significant decline in out-of-network facility charges from 14.3% in 2007 to 1.6% of all surgeries in 2012 ($P_{\text{trend}} < .001$; Fig. 2), before a significant rise to 16.9% of surgeries in 2013, 25.0% in 2014, and then decreasing again to 15.5% in 2015, 10.8% in 2016, and 6.4% in 2017.

To determine whether the relative and absolute increase in surgeries being performed at ASCs was what was driving this increase in out-of-network bills, we explored rates of out-of-network charges between these facilities separately. Indeed, the proportion of OP-TJAs being performed at out-of-network ASCs declined from 23.9% in 2007 to 11.1% in 2012, before rising to 35.3% in 2013, 42.0% in 2014, 26.1% in 2015, 18.6% in 2016, and 12.1% in 2017 (Fig. 3). In contrast, the proportion of OP-TJAs being performed at out-of-network HOPDs ranged from 4.6% in 2011 to 3.2% in 2017 with a peak of 7.9% in 2013 and trough of 1.9% in 2016 (Fig. 3). Similar trends were seen among the subset of patients being treated by in-network surgeons (ASC vs HOPD; 2011: 8.5% vs 2.3%; 2012: 4.0% vs 0.8%; 2013: 31.7% vs 4.6%; 2014: 39.5% vs 4.5%; 2015: 21% vs 2.3%; 2016: 14.9% vs 0.8%; 2017: 8.1% vs 2.1%).

Across all patients, and after adjusting for age, year, gender, surgery, and geography, patients treated at ASCs had 4.88 (95% confidence interval [CI] 4.28–5.57, $P < .001$) odds of being treated at an out-of-network facility compared to those undergoing surgery at an HOPD. This risk of being treated at an out-of-network facility was even more pronounced when limiting to in-network surgeons (odds ratio 7.70, 95% CI 6.42–9.25, $P < .001$). Of the 11,136 patients treated at in-network hospitals, 4.5% had an out-of-network surgeon; in contrast, of the 11,870 patients being treated by in-network surgeons, 10.4% were treated at an out-of-network facility.

The mean (95% CI) potential balance bill for patients undergoing OP-TJA at an out-of-network facility was \$11,566 (95% CI \$10,745–\$12,388).

Discussion

Although the utilization of both OP-TJAs and ASCs continues to rise, the temporal trends in the relative utilizations of ASCs vs HOPDs and the financial implications of this for patients were unknown. In this study investigating a large national sample of commercially insured individuals in the United States, we found that ASCs have become significantly more common, representing 24.2% of OP-TJAs in 2007 compared to 71.1% in 2017. Although we encouragingly found that the proportion of OP-TJAs performed at out-of-network facilities significantly decreased over time, this was non-linear with a substantial spike corresponding to the growing use of ASCs beginning in 2013. Moreover, across the study period, patients undergoing TJA at an ASC had nearly 5× the adjusted odds of being treated at an out-of-network facility compared to patients undergoing surgery at an HOPD, with over 1/10 of patients being treated at an out-of-network facility even in 2017. These findings could be related to the delay and/or difficulty in contracting that is associated with the launch of new ASCs, and if so, would highlight the need for insurers to accelerate this process to minimize the substantial financial burden of out-of-network bills on patients.

One of the most significant findings of this study was the higher rates of out-of-network charges for patients undergoing TJA at ASCs when compared to HOPDs. Although hospitals typically have long-standing contracts with insurance companies, ASCs often require the development of new relationships. The spike in out-of-network facilities in this study period corresponded precisely with the rocketing growth of ASCs seen both in the relative utilization rates in this study and also as documented by the Ambulatory Surgery Center Association [21]. In 2014, ASCs surpassed HOPDs as the most

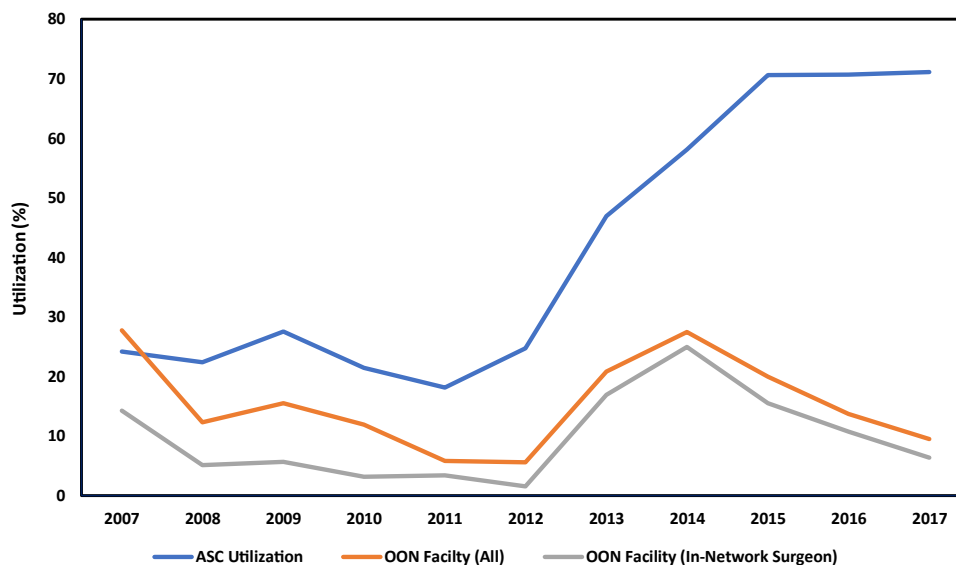


Fig. 2. Proportion of outpatient total joint arthroplasties performed at OON facilities, overlaid with the relative utilization of ASCs. The gray line presents the proportion of surgeries performed at OON facilities among the 11,870 patients who were treated by an in-network surgeon. ASC, ambulatory surgery center; OON, out-of-network.

common location of OP-TJA (58.1%) and over 40% of patients undergoing surgeries at ASCs that year were out of-network. The improvements seen from 2015 to 2017 are likely related to the slowed growth of new ASCs coupled with ASCs launched in the years prior ultimately gaining contracts with insurance companies. Still, even in 2017, over 12% of patients treated at ASCs were out-of-network, compared to 3% for those undergoing surgery in an HOPD. These substantially elevated rates through 2017 are striking as they come in the face of scrutiny from patients, physicians, and policymakers on surprise and out-of-network billing that has led to substantial reductions in this practice nationally (<5%), as was also reflected in the trends for HOPDs in this study [30–32].

The estimated balance bill for patients undergoing surgery at an out-of-network facility was over \$10,000. These results are

concerning as a growing number of Americans continue to have less confidence in their ability to pay for healthcare, with nearly half of working-age adults saying they would be unable to pay an unexpected expense of over \$400 [33,34]. This phenomenon again underscores the need to expedite contracting between insurance companies and new ASCs to avoid these dire consequences on patients. Although establishing basic initial procedural agreements may be fairly straightforward, anecdotally, the negotiations are often challenging due to the inability to agree on rates. In the interim, orthopedic surgeons should be aware of this phenomenon and may utilize their office staff to help their patients check whether they will be covered at an ASC. We found that the adjusted risk of being treated at an out-of-network facility between ASCs vs HOPDs was even more pronounced among patients seeing in-

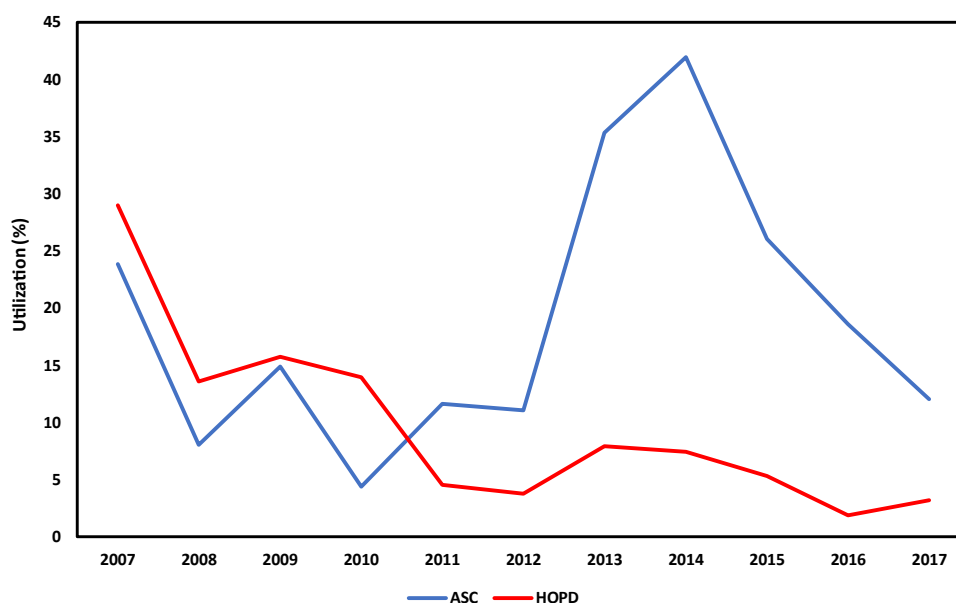


Fig. 3. Proportion of all outpatient total joint arthroplasties performed at out-of-network facilities stratified between ASCs and HOPDs. ASC, ambulatory surgery center; HOPD, hospital outpatient department.

network orthopedic surgeons, and it is likely that these out-of-network charges come as a surprise to at least some, if not many, of these patients. Moving forward, future work may be helpful in assessing the usefulness of bundled payment packages that include both facility and professional fees, allowing providers to use their current relationship with insurers to help accelerate negotiations when new ASCs are launched [23].

Fortunately, expediting negotiations and in-network agreements can be a positive for both ASCs and insurance companies. For example, Carey et al [19] recently demonstrated that OP-TJA was associated with \$5000–\$7500 in savings compared to inpatient TJA in a large commercially insured population. Given that many hospitals defer OP-TJAs to ASCs (ie, HOPD is not an option), forcing OP-TJA candidates to undergo inpatient TJA simply due to a lack of insurance agreement with the ASC may be counterproductive for all parties. Moreover, efficient networking behaviors between insurance providers and hospitals have been consistently shown to achieve better performances and create new channels of communication and knowledge between hospitals and patient providers [35].

Although this paper has several strengths, including using one of the largest and highest quality commercial claims databases available, it not without limitations. First, MarketScan is not a nationally representative sample. Although we presented the raw increase in OP-TJAs within the database for perspective, these numbers should not be seen as absolute rates. The primary focus of our analysis was on the relative rates between ASCs and HOPDs, which could be reliably compared within the sample. Next, MarketScan primarily includes patients with employer-sponsored insurance. Although this is the source of insurance for the majority of Americans, the generalizability of these results to patients with insurance purchased on the exchanges is uncertain. Similarly, generalizability is limited to the 90%+ patients whose insurers provided network coverage status for provider payments in the MarketScan database [26,27]. Next, because claims data cannot demonstrate the amount patients are balance billed, the potential balance bill amounts are only estimates, consistent with a large body of health policy research on this topic [25–28]. Importantly, even when patients do not receive balance bills, out-of-network billing generally increases costs as insurance plans often require higher cost-sharing (eg, deductibles, co-insurance, co-pays) for out-of-network care. As such, the estimates arrived at using the approach of the current study are traditionally considered to be conservative [25,27]. Finally, we were unable to determine whether patients were aware of their out-of-network status at the treating facility. However, given the substantial financial costs associated with this treatment coupled with the fact this phenomenon often occurred for patients who sought out in-network surgeons, it is likely that some, if not many, of these out-of-network facility bills were unexpected.

In conclusion, although the proportion of out-of-network facility charges are decreasing with time, over 10% of patients receiving care by in-network surgeons face out-of-network facility charges, which may often come as a surprise. As OP-TJA is often more cost-effective in appropriate patients, insurers should work to expedite contracting with ASCs to increase access to and minimize adverse financial effects of this valuable treatment. In the interim, given the high prevalence of out-of-network ASCs, surgeons performing OP-TJAs at ASCs should have their team review facility coverage statuses with their patients in an effort to avoid any potential surprise out-of-network charges.

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