Paper #18 QUANTIFICATION OF COST SAVINGS FROM OUTPATIENT TOTAL SHOULDER ARTHROPLASTY

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Introduction: Finding ways to contain costs in joint replacement surgery has become a central issue as the cost of healthcare continues to rise. High-volume arthroplasty centers have been shown to have lower costs and better outcomes. Outpatient arthroplasty has also been shown to help control healthcare costs, and recent studies suggest that outpatient total shoulder arthroplasty (TSA) is safe and effective for appropriately selected patients. However, specific costs associated with outpatient TSAs remain poorly studied. The purpose of this study was to evaluate and compare the patient-level costs of elective inpatient and outpatient total shoulder arthroplasty (TSA) in the State of Texas between 2010 and 2015. We hypothesized that the cost of inpatient and outpatient TSA from 2010 to 2015 increased at the similar rates and that outpatient TSA would be significantly less costly than both high- and low-volume inpatient centers.

Methods: De-identified inpatient and outpatient records for the State of Texas are publicly available and were obtained from the Texas Department of State Health Services in November 2016 covering the interval from 2010-2015. These records included billing information related to all patient visits regardless of age and health insurance coverage. Inpatient and outpatient records that included ICD-9-CM codes (inpatient before October 2015), ICD-10-PCS codes (inpatient after October 2015) and CPT codes (outpatient) for elective primary TSA were extracted for analysis (ICD-9-CM codes: 81.80, 81.88; ICD-10-PCS codes: 0RRJ0JZ, 0RRK0JZ, 0RRJ0J6, 0RRJ0J7, 0RRK0J6, 0RRK0J7, 044J00Z, 0RRK00Z; CPT codes: 23472). Outpatient records which included CPT codes 99231 and 99235 (postoperative inpatient observation codes) were considered to represent inpatient TSA. Cost analyses were performed comparing inpatient and outpatient TSA using a one-way ANOVA was used to compare baseline patient demographics and average costs. Inpatient TSA centers performing more than 15 TSAs per year were considered to represent high-volume centers. A mixed model ANOVA (group x time) was used to determine the change in average total costs between inpatient and outpatient TSA procedures from 2010 thru 2015. Statistical significance occurred when $P < .05$.

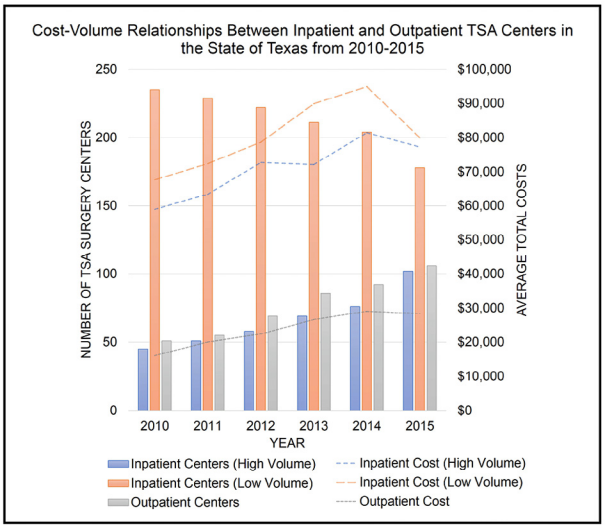

Figure 1 Bar graph showing average cost for inpatient and outpatient TSA according to high- and low-volume thresholds (>15 TSAs/year indicates high-volume).

Table 1 Direct comparisons between itemized costs of inpatient and outpatient TSA centers

Cost Categories	Inpatient	Outpatient	Cost Difference	P-value
Total, ± SD	$73,624 ± $11,472	$49,013 ± $2,214	-$24,611 ± $8,262	< 0.001*
Covered Charges, ± SD	$68,624 ± $19,643	$47,034 ± $3,152	-$21,230 ± $14,067	< 0.001*
Non-Covered Charges, ± SD	$5,360 ± $16,085	$1,979 ± $2,724	-$3,381 ± $11,536	< 0.001*
Accommodation Charges, ± SD	$8,475 ± $12,441	$0 ± $0	-$8,475 ± $12,441	< 0.001*
Physical Therapy Charges, ± SD	$489 ± $695	$207 ± $305	-$282 ± $537	< 0.001*
Occupational Therapy Charges, ± SD	$243 ± $527	$56 ± $185	-$187 ± $395	< 0.001*
Operating Room Charges, ± SD	$18,593 ± $12,687	$17,376 ± $11,327	-$1,157 ± $12,026	0.001*
Anesthesia Charges, ± SD	$3,286 ± $2,786	$2,387 ± $2,291	-$899 ± $2,551	0.315
Laboratory Charges ± SD	$1,976 ± $3,696	$692 ± $936	-$1,284 ± $2,696	< 0.001*
Radiology Charges, ± SD	$952 ± $2,482	$396 ± $575	-$556 ± $1,802	< 0.001*

*Statistical significance (p<0.05)

Results: The average total costs for TSA between 2010 and 2015 were significantly less for procedures performed outpatient versus inpatient ($49,013 ± $2,214 versus $73,624 ± $11,372; $P < .001$). Cost savings related to outpatient TSA persisted even when accommodation costs were excluded, and when compared directly to high-volume inpatient centers ($22,909 ± $13,595 versus $66,222 ± $37,271; $P < .001$). **Figure 1** shows the average cost for inpatient and outpatient procedures according to their yearly volume (high- and low-volume). Outpatient TSA was found to have significantly lower costs with respect to operating room, laboratory, physical therapy, occupational therapy, radiology services, and laboratory services (**Table 1**). Costs increased significantly for both inpatient and outpatient TSA from 2010 to 2015 (Inpatient TSA: $59,413 ± $692 in 2010 to $85,931 ± $525 in 2015; Outpatient TSA: $36,445 ± $2,676 in 2010 to $56,476 ± $1,919 in 2015; $P < .001$). There was no "group x time" interaction ($F = 0.758$, $P = .781$), indicating that the rate of cost increase between 2010 and 2015 were not statistically significant.

Conclusion: Overall costs for TSA continue to rise substantially, and these trends appear to be consistent for both inpatient and outpatient procedures. Outpatient TSA demonstrates significantly lower costs that inpatient TSA, even when costs related directly to hospital accommodation were excluded, and when compared directly to high volume inpatient centers. Protocols for safe and effective treatment of appropriately selected patients in an outpatient setting should be developed to minimize health care costs.

Paper #19 OSSEOUS INTEGRATION OF THE CENTRAL PEG OF AN ALL-POLYETHYLENE GLENOID WITH THREE DIFFERENT SURGICAL TECHNIQUES

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Background: Several all-polyethylene glenoid components are designed for osseous integration in the central peg. Surgical techniques for treatment of the central peg include no graft (NG), autogenous bone graft (ABG), and demineralized bone matrix (DBM). The purpose of this study was to compare osseous integration with these three techniques. The hypothesis was there would be no difference in ossesous integration or radiographic loosening with these three techniques.

Methods: A multicenter randomized control trial was performed on primary total shoulder arthroplasties performed with a