

Rising Utilization and Feasibility of Outpatient Revision Total Knee Arthroplasty in the Ambulatory Surgery Center Setting

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INTRODUCTION: While revision total knee arthroplasty (rTKA) has historically been managed as an inpatient procedure, advances in perioperative protocols and policy shifts (e.g., CMS IPO list updates) have opened the door for outpatient revision surgery in select patients. This study evaluates national trends in ASC-based rTKA, compares outcomes and episode costs across surgical settings, and introduces a novel predictive tool to identify patients at risk for prolonged length of stay.

METHODS: We retrospectively analyzed all revision total knee (TKA) procedures conducted using the Merative™ MarketScan® Commercial and Medicare Supplemental databases from 2018 to 2023. Primary outcomes included rates of same-day and ≤23-hour discharge. Trends in procedure volume and complexity (e.g., single vs. two-component revisions) were assessed. To identify patients at risk for extended stay, we developed a risk scoring system based on the presence of 53 medical comorbidities across 9 organ systems. Predictive performance of the scoring system was assessed using sensitivity, specificity, and positive predictive value (PPV) for identifying patients requiring a length of stay >0 days. Costs were adjusted for inflation to January 2023.

RESULTS: Among 19,853 rTKA cases, ASC patients (n=492) were younger (mean 57.5 vs. 62.9 years IP), had lower CCI (1.67 vs. 2.98 IP), and lower total costs (\$24,596 vs. \$42,880 IP; *p*<0.001). Same-day discharge was achieved in 84.8% of ASC cases, with 96.3% discharged by 23 hours. A growing proportion of two-component revisions were performed in ASC settings over time (*p*<0.001). Comorbidities such as OSA, cardiac disease, and PVD were significantly more common in inpatient settings. Our comorbidity-based scoring tool achieved 81% sensitivity and 87% PPV for predicting patients requiring LOS >0 days.

DISCUSSION AND CONCLUSION: ASC-based revision TKA is a viable, cost-effective option for appropriately selected patients, with high rates of safe same-day discharge. Patients undergoing ASC rTKA had fewer comorbidities and significantly lower total costs compared to hospital-based settings. Our predictive tool offers a practical approach for patient triage, supporting safe outpatient expansion. These findings underscore the need for updated clinical criteria and reimbursement policies that reflect the evolving landscape of revision arthroplasty care.

Revision Knee Arthroplasty by Surgical Setting					
level	Overall	ASC	HOPD	IP	P-value
n	10792	77	2084	8622	
Age*	63.72 (12.76)	58.29 (8.76)	62.24 (12.32)	64.14 (12.86)	<0.001
Region^					0.002
1: Northeast	1714 (15.9)	8 (10.4)	266 (12.8)	1439 (16.7)	
2: North Central	3728 (34.5)	34 (44.2)	729 (35.0)	2963 (34.4)	
3: South	3979 (36.9)	26 (33.8)	812 (39.0)	3141 (36.4)	
4: West	1347 (12.5)	9 (11.7)	272 (13.1)	1060 (12.3)	
5: Unknown	24 (0.2)	0 (0.0)	5 (0.2)	19 (0.2)	
Sex*					0.566
Male	4865 (45.1)	32 (41.6)	923 (44.3)	3909 (45.3)	
Female	5927 (54.9)	45 (58.4)	1161 (55.7)	4713 (54.7)	
CCI*	3.10 (2.29)	1.78 (1.45)	2.70 (2.06)	3.21 (2.34)	<0.001
Primary payer^					<0.001
Commercial	6742 (62.5)	73 (94.8)	1609 (77.2)	5051 (58.6)	
Medicare	4050 (37.5)	4 (5.2)	475 (22.8)	3571 (41.4)	
Admission Type^					<0.001
Inpatient	8931 (82.8)	0 (0.0)	570 (27.4)	8361 (97.0)	
Outpatient	1861 (17.2)	77 (100.0)	1514 (72.6)	261 (3.0)	
Number of Components Revised^					0.026
1	3872 (35.9)	28 (36.4)	695 (33.3)	3148 (36.5)	
2	6920 (64.1)	49 (63.6)	1389 (66.7)	5474 (63.5)	
Length of Stay (days)*	3.69 (5.30)	0.25 (0.73)	3.01 (5.76)	3.89 (5.18)	<0.001
Length of Stay Buckets^					<0.001
Same Day	1282 (11.9)	65 (84.4)	331 (15.9)	880 (10.2)	
1 day	3006 (27.9)	8 (10.4)	936 (44.9)	2062 (23.9)	
2 days	1655 (15.3)	3 (3.9)	168 (8.1)	1483 (17.2)	
3 days	1154 (10.7)	0 (0.0)	123 (5.9)	1030 (11.9)	
4+ days	3695 (34.2)	1 (1.3)	526 (25.2)	3167 (36.7)	
Total Pay (USD)**	42746.66 (38978.90)	23608.11 (11760.23)	37240.79 (34902.06)	44276.23 (39899.57)	<0.001