

Healthcare Utilization and Costs in the Year Prior to and After Total Hip Arthroplasty

Elizabeth Abe¹, Nihir Parikh, Daniel Nemirov², Matthew Sherman¹, Paul Maxwell Courtney, Chad A Krueger

¹Rothman Orthopaedic Institute, ²Tjuh/Rothman

INTRODUCTION: In the era of value-based care (VBC), cost-reduction strategies for total hip arthroplasty (THA) have focused on surgical bundles and reductions in post-acute care spending. Few studies have evaluated the costs of non-operative treatment and the impact of THA as a cost-saving measure for longitudinal spending. The purpose of this study was to determine the costs of care for THA patients in the year before and year following THA.

METHODS:

This study reviewed a consecutive series of 12,240 primary THA patients from 2020-2023. Pre-operative healthcare utilization and associated costs were stratified by primary payer claims and included office visits, steroid injections, physical therapy (PT), x-rays, and magnetic resonance imaging (MRIs). Similarly, one year post-operative costs were calculated and included office visits, PT, x-rays, MRIs, emergency department (ED) visits, and revisions.

RESULTS: There were 5,394 (44.1%) patients with commercial insurance, 1,952 (15.9%) with Medicare Advantage, 4,615 (37.7%), with Medicare, and 279 (2.28%) self-pay. In the year before THA, the mean overall claims costs was \$317±254, led by PT visits (\$421±503), MRI (\$403±271), office visits (\$222±142), and corticosteroid injections (\$208±141). There was no difference by payer (p=0.959). In the year following THA, the mean claims costs was \$262±461, led by revisions (\$2,646±2127), PT (\$550±615), and ED visits (\$206±65.4). Commercially insured patients had the highest costs amongst payers (p=0.007).

DISCUSSION AND CONCLUSION:

In the year following THA, patients had nearly \$100 less claims costs when compared to the costs of nonoperative treatment in the year prior to surgery. Policy makers should be aware of the cost-efficacy of THA when contemplating longitudinal VBC models for the management of osteoarthritis.

Table 1. Clinical characteristics of patients primarily insured by commercial providers, Medicare Advantage, Medicare, or were self-pay who underwent THA (n=12,240).

	Commercial (n=5,394)	Medicare Advantage (n=1,952)	Medicare (n=4,615)	Self-Pay (n=279)	p-value
Age (Years)	59.2 ± 8.18	73.0 ± 7.24	72.7 ± 6.73	59.0 ± 7.44	<0.001
Sex					
Female	2483 (46.0%)	1152 (59.0%)	2801 (60.7%)	127 (45.5%)	
Male	2911 (54.0%)	800 (41.0%)	1814 (39.3%)	152 (54.5%)	
Race					
White	4040 (74.9%)	1434 (73.5%)	3604 (78.1%)	122 (79.6%)	
Black	448 (8.31%)	198 (10.1%)	226 (4.90%)	6 (2.15%)	
Other	906 (16.8%)	320 (16.4%)	785 (17.0%)	51 (18.3%)	
Ethnicity					
Non-Hispanic	5357 (99.3%)	1938 (99.3%)	4591 (99.3%)	276 (98.9%)	
Hispanic	37 (0.69%)	14 (0.72%)	24 (0.52%)	3 (1.08%)	
BMI (kg/m ²)	30.1 ± 5.52	29.6 ± 5.46	28.8 ± 5.35	29.1 ± 5.88	
CCI	2.76 ± 1.26	4.46 ± 1.47	4.29 ± 1.41	2.64 ± 1.06	
ASA	2.24 ± 0.38	2.53 ± 0.44	2.47 ± 0.41	2.17 ± 0.45	
Inpatient vs. Outpatient					
Inpatient	2808 (46.0%)	936 (47.93%)	2808 (61.28%)	173 (62.3%)	
Outpatient	2506 (46.8%)	1016 (52.0%)	1775 (38.8%)	104 (37.7%)	
Laterality					
Left	2526 (46.8%)	855 (43.8%)	2079 (45.0%)	135 (48.4%)	
Right	2868 (53.2%)	1097 (56.2%)	2536 (55.0%)	144 (51.6%)	
Secondary Payer					
Commercial	0 (0.00%)	15 (0.77%)	3096 (67.1%)	198 (71.0%)	
Medicare Advantage	54 (1.00%)	0 (0.00%)	816 (17.7%)	11 (3.94%)	
Medicare	35 (0.65%)	2 (0.10%)	0 (0.00%)	0 (0.00%)	
Self-Pay	1815 (33.6%)	133 (6.81%)	164 (3.55%)	0 (0.00%)	
Preop SF-12 PCS	48.4 ± 15.7	48.3 ± 15.4	49.3 ± 15.6	51.8 ± 12.8	
Post SF-12 PCS	52.8 ± 8.19	53.4 ± 8.27	52.5 ± 8.17	52.0 ± 8.19	

Values given as mean ± SD or N (%).
BMI, Body mass index; CCI, Age-adjusted Charlson comorbidity index; ASA, American Society of Anesthesiologists physical status classification; HLOS-JR, Hip Dysfunction and Osteoarthritis Outcome Score for Joint Replacement; SF-12, 12-item Short Form Health Survey; PCS, physical component summary.

Table 2. Utilization of care and nonoperative treatment in the year preceding THA (n=12,240).

	Commercial (n=5,394)	Medicare Advantage (n=1,952)	Medicare (n=4,615)	Self-Pay (n=279)	p-value
Steroid Injection	768 (14.2%)	294 (15.1%)	668 (14.5%)	35 (12.5%)	0.659
Number of Encounters	1.29 ± 0.57	1.30 ± 0.63	1.33 ± 0.60	1.20 ± 0.53	0.274
Steroid Cost (\$)	265 ± 139	211 ± 146	212 ± 143	196 ± 172	0.931
Cost (\$)	13 (0.24%)	7 (0.36%)	9 (0.20%)	1 (0.36%)	0.622
Number of Encounters	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00	1.00	1.00
Cost (\$)	457 ± 314	402 ± 277	345 ± 223	252	0.862
Office Visits	3970 (73.6%)	1487 (76.2%)	3515 (76.2%)	206 (73.8%)	0.014
Number of Encounters	1.56 ± 0.84	1.55 ± 0.86	1.55 ± 0.86	1.49 ± 0.79	0.662
Cost (\$)	221 ± 125	219 ± 124	225 ± 167	213 ± 116	0.822
PT	113 (2.09%)	42 (2.15%)	122 (2.64%)	10 (3.58%)	0.141
Number of Encounters	4.51 ± 4.34	3.83 ± 3.29	4.07 ± 4.89	4.70 ± 4.81	0.743
Cost (\$)	427 ± 439	375 ± 317	423 ± 601	535 ± 535	0.479
X-Ray	3404 (63.1%)	1268 (65.0%)	3056 (65.8%)	170 (60.9%)	0.023
Number of Encounters	1.17 ± 0.42	1.18 ± 0.42	1.17 ± 0.43	1.18 ± 0.46	0.859
Cost (\$)	50.3 ± 27.4	49.1 ± 25.3	50.3 ± 25.9	50.7 ± 23.9	0.706
Total Cost in Year Prior (\$)	315 ± 239	312 ± 224	322 ± 279	316 ± 267	0.959
THA Surgery					
Reimbursement Fee (\$)	5059 ± 1191	1611 ± 180	1559 ± 143	4707 ± 1351	<0.001

Values given as mean ± SD or N (%).
MRI, Magnetic Resonance Imaging; PT, Physical Therapy

Table 3. Utilization of care and nonoperative treatment in the year following THA with associated PROMs (n=12,240).

	Commercial (n=5,394)	Medicare Advantage (n=1,952)	Medicare (n=4,615)	Self-Pay (n=279)	p-value
MRI	4 (0.07%)	1 (0.05%)	3 (0.07%)	0	0.943
Number of Encounters	1.00 ± 0.00	1.00	1.33 ± 0.58	0	0.435
Cost (\$)	797 ± 173	227	320 ± 126	0	0.052
Office Visits	1435 (26.4%)	518 (26.5%)	943 (20.4%)	74 (26.9%)	<0.001
Number of Encounters	1.57 ± 0.94	1.56 ± 0.94	1.55 ± 0.87	1.42 ± 0.68	0.788
Cost (\$)	160 ± 123	156 ± 116	154 ± 112	151 ± 112	0.618
PT	92 (1.71%)	35 (1.79%)	97 (2.10%)	9 (3.23%)	0.184
Number of Encounters	7.55 ± 9.00	5.00 ± 4.25	6.62 ± 7.06	5.67 ± 5.17	0.763
Cost (\$)	733 ± 774	372 ± 296	456 ± 450	375 ± 333	0.088
X-Ray	1605 (29.8%)	582 (29.8%)	1121 (24.3%)	79 (28.3%)	<0.001
Number of Encounters	1.68 ± 0.83	1.73 ± 0.86	1.66 ± 0.86	1.58 ± 0.78	0.169
Cost (\$)	85.5 ± 81.5	70.3 ± 38.5	65.6 ± 36.4	74.8 ± 43.3	<0.001
Emergency Department	9 (0.17%)	4 (0.20%)	5 (0.11%)	1 (0.36%)	0.625
Number of Encounters	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00	1.00	1.00
Cost (\$)	344 ± 63.6	167 ± 94.9	165 ± 54.5	730	0.077
Dilatation	1 (0.02%)	2 (0.10%)	0	0	0.116
Number of Encounters	1.00	1.00 ± 0.00			
Cost (\$)	1265	767 ± 442			0.221
Revision	21 (0.39%)	7 (0.36%)	13 (0.28%)	1 (0.36%)	0.862
Number of Encounters	1.10 ± 0.30	1.29 ± 0.76	1.00 ± 0.00	1.00	0.610
Cost (\$)	3785 ± 2481	1629 ± 310	1454 ± 776	1323	0.023
Total Cost in Year After (\$)	291 ± 599	240 ± 311	257 ± 292	229 ± 295	0.007
Postop HLOS-JR	76.2 ± 19.5	73.5 ± 19.4	75.3 ± 19.0	80.4 ± 18.4	0.003
Postop SF-12 PCS	42.3 ± 8.31	41.2 ± 8.35	41.7 ± 8.87	43.2 ± 7.65	0.111
Δ HLOS-JR	33.6 ± 21.4	32.3 ± 20.2	31.7 ± 20.8	30.7 ± 17.6	0.153
Δ SF-12 PCS	11.6 ± 11.1	9.52 ± 11.3	10.9 ± 10.8	12.4 ± 10.8	0.271
Attained MCID at 1 Year	77.3%	76.2%	73.9%	72.2%	0.303

Values given as mean ± SD or N (%).
MRI, Magnetic Resonance Imaging; PT, Physical Therapy; ED, Emergency Department; HLOS-JR, Hip Dysfunction and Osteoarthritis Outcome Score for Joint Replacement; SF-12, 12-item Short Form Health Survey; PCS, physical component summary; MCID, minimal clinically important difference.