

# How have Total Joint Arthroplasty Implant Prices Changed Compared to Overall Costs and Reimbursements?

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**INTRODUCTION:** Total joint arthroplasty (TJA) is among the most highly performed procedures in the United States (US) with high success rates and cost-effectiveness. Previous studies have documented trends in costs, reimbursements, and volume for TJA along with cost control measures for TJA procedures. Implant costs are generally considered to comprise a large portion of total costs for primary and revision TJA. However, there is limited information regarding recent trends in TJA implant prices. As TJA volumes continue to increase and cost control pressure continues to mount, understanding these financial trends will be increasingly important for surgeons. Thus, the purpose of this study was to investigate how implant prices have changed compared to overall costs and reimbursements for TJA. To our knowledge, this is the first study to evaluate trends in implant costs over the past few decades and their relative impact on total costs.

**METHODS:** A commercial insurance claims database was queried from 2009-2021 for overall costs, hospital reimbursements, physician reimbursements, and patient out-of-pocket (OOP) costs for total knee arthroplasty (TKA), total hip arthroplasty (THA), revision total knee arthroplasty (rTKA), and revision total hip arthroplasty (rTHA). Average implant prices between 2009-2021 were extracted from Orthopedic Network News (ONN), the largest publicly available implant registry. All costs, reimbursements, and prices were adjusted for inflation. Trends were analyzed using linear regressions.

## RESULTS:

There were 157,413 total procedures across TKA, THA, rTKA, and rTHA included. Between 2009 and 2021, the average price for TKA implants was \$5,899; \$6,776 for THA; \$11,576 for rTKA; and \$7,419 for rTHA. For primary TJA, there was no significant change in overall costs (TKA:  $b=145.8$ ,  $p=0.14$ ; THA:  $b=173.3$ ,  $p=0.06$ ). While both hospital reimbursement (TKA:  $b=209.9$ ,  $p=0.03$ ; THA:  $b=219.4$ ,  $p=0.01$ ) and OOP patient cost (TKA:  $b=27.0$ ,  $p<0.001$ ; THA:  $b=31.7$ ,  $p<0.001$ ) increased significantly between 2009 and 2021, physician reimbursement (TKA:  $b=-31.9$ ,  $p<0.001$ ; THA:  $b=-23.4$ ,  $p<0.001$ ) and implant prices (TKA:  $b=-249.7$ ,  $p<0.001$ ; THA:  $b=-287.1$ ,  $p<0.001$ ) decreased significantly.

For revision TJA, there was a significant increase in overall costs for both rTKA ( $b=557.3$ ,  $p<0.001$ ) and rTHA ( $b=754.7$ ,  $p<0.001$ ). For both rTKA and rTHA, hospital reimbursement (rTKA:  $b=625.0$ ,  $p<0.001$ ; rTHA:  $b=836.7$ ,  $p<0.001$ ) increased significantly while physician reimbursement (rTKA:  $b=-46.3$ ,  $p<0.001$ ; rTHA:  $b=-59.5$ ,  $p=0.002$ ) decreased significantly. Implant prices for rTKA did not change significantly in the time frame ( $b=100.5$ ,  $p=0.34$ ) while implant prices for rTHA decreased significantly ( $b=-197.9$ ,  $p<0.001$ ).

## DISCUSSION AND CONCLUSION:

Between 2009 and 2021, inflation-adjusted implant prices decreased significantly for TKA, THA, and rTHA with no significant change for rTKA. Despite the trend in decreasing prices for TJA implants, hospital reimbursements and OOP patient costs rose significantly while physician reimbursement decreased significantly. Amidst increasing TJA volumes and mounting cost control pressure, these trends are important to consider in implementing future changes to clinical practice, payment, and

Figure 1. TJA Cost, Reimbursement, and Implant Price Trends.

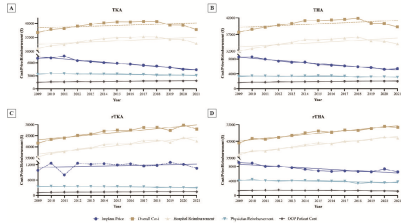


Table 1. Characteristics and Overall Costs, Reimbursement, and Payment for TKA, THA, rTKA, and rTHA, 2009-2021.

	TKA	THA	rTKA	rTHA
Total number of procedures	365,485	215,680	36,518	18,018
Age, mean (SD)	57.4 (5.4)	55.7 (7.2)	56.7 (6.2)	55.2 (7.4)
Female (%)	61%	69%	59%	52%
Length of stay, mean (SD)	2.8 (1.8)	2.4 (1.9)	3.2 (2.9)	3.1 (2.5)
Total cost for procedure (95% CI), \$	39,096 (39,044-39,149)	40,027 (39,959-40,095)	45,571 (45,324-45,818)	48,319 (48,025-48,615)
Total hospital charge (95% CI), \$	33,414 (33,364-33,462)	34,351 (34,287-34,414)	39,524 (39,289-39,759)	41,324 (41,048-41,599)
Total physician payment (95% CI), \$	3,392 (3,384-3,399)	3,589 (3,556-3,581)	3,397 (3,368-3,426)	4,038 (3,985-4,091)
Total OOP cost for procedure (95% CI), \$	1,602 (1,645-1,659)	1,855 (1,845-1,865)	1,319 (1,295-1,342)	1,803 (1,372-1,433)
Average selling price for implant from ONN (95% CI), \$	5,899 (5,366-6,440)	6,776 (6,165-7,390)	11,576 (10,806-12,300)	7,419 (6,940-7,900)

Table 2. TJA Linear Regression Trends.

Procedure	Category	Slope	95% Confidence Interval	P-value
TKA	Overall Cost	145.8	-25.3 to 345.0	0.14
	Hospital Reimbursement	209.9	28.9 to 392.9	<0.001
	Physician Reimbursement	-31.9	-65.9 to -17.9	<0.001
	OOP Patient Cost	26.97	20.6 to 33.3	<0.001
THA	Overall Cost	173.3	-5.9 to 352.1	0.06
	Hospital Reimbursement	219.4	33.1 to 405.8	<0.001
	Physician Reimbursement	-23.35	-42.49 to -4.3	<0.001
	OOP Patient Cost	31.68	22.4 to 40.9	<0.001
rTKA	Overall Cost	557.3	384.5 to 730.2	<0.001
	Hospital Reimbursement	625	478.5 to 779.4	<0.001
	Physician Reimbursement	-46.33	-67.4 to -25.2	<0.001
	OOP Patient Cost	23.14	14.4 to 31.9	<0.001
rTHA	Overall Cost	754.7	623.4 to 886.0	<0.001
	Hospital Reimbursement	836.7	716.7 to 956.7	<0.001
	Physician Reimbursement	-59.49	-91.3 to -27.7	<0.001
	OOP Patient Cost	-197.9	-352.9 to -11	<0.001

P-values highlighted in green represent significant increases while red represents significant decreases.