Implant Cost is not Associated with Clinically Significant Outcomes in Patients Undergoing TKA

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INTRODUCTION:

Total knee arthroplasty (TKA) can produce highly variable costs given the available selection of implants. Orthopaedics is shifting towards incentivizing surgeons that maximize value, defined as change in patient-reported outcome (PRO) divided by total cost of an intervention. The purpose of this study was to identify if implant cost is associated with clinically meaningful improvements in Knee Injury and Osteoarthritis Outcome Score Joint Replacement (KOOS-JR) after TKA.

METHODS:

This retrospective review of prospectively-collected data identified patients that underwent primary TKA from 2018-2020 at a multicenter healthcare system. Patients without one-year KOOS-JR follow-up or recorded implant costs were excluded from the study. Clinically significant outcomes were defined using an anchor-based minimum clinically significant difference (MCID) based on the Patient-Reported Outcome Measurement Information System quality-of-life instrument (PROMIS-QoL). Correlation between KOOS-JR change and implant costs was conducted. Costs were compared between patients that achieved MCID and those that did not.

RESULTS:

A total of 347 patients were included. 69.2% were female with average age of 66.7 and average body mass index (BMI) of 32.5 (Table 1). Average KOOS-JR change was +24.4, and average total implant cost was $4,017.56 (S.D. $1187.42). Implant cost did not correlate with one-year KOOS-JR change (r^2=0.05) (Figure 1), and implant costs were no different between patients that achieved MCID and those that did not (p=0.348).

DISCUSSION AND CONCLUSION:

Implant costs are highly variable and not associated with improved PRO changes or higher likelihood to achieve clinically significant outcomes in primary TKA patients. By choosing lower cost implants for TKA, surgeons can enhance patient value while not compromising patient-perceived satisfactory outcomes. Value analysis of all aspects and costs involved in a TKA episode of care could further reveal areas under surgeon influence that can be targeted for cost mitigation and value optimization.

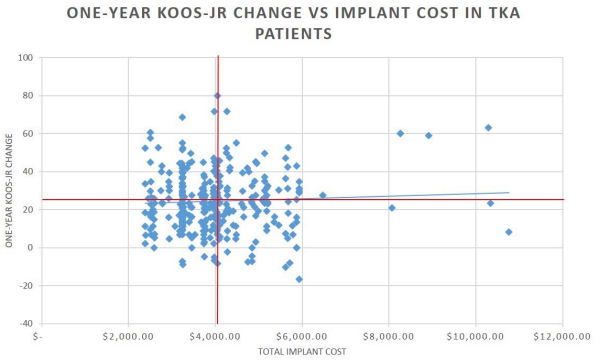

Table 1. Demographics and Baseline Characteristics for Primary TKA[a] Patients (N=347).

Age	66.7 ± 8.8
Sex	
Female	240 (69.2%)
Male	107 (30.8%)
BMI[b]	32.5 ± 6.6
ASA[c] Score	
1	16 (4.7%)
2	196 (57.8%)
3	127 (37.5%)
Preoperative KOOS-JR[d]	52.0 ± 12.3
Operative Time (minutes)	125 ± 26
Hospital LOS[e] (hours)	46.3 ± 29.7
Discharge Disposition	
Home, Self-Care	244 (73.7%)
Home, Health Services	30 (9.1%)
Skilled Nursing Facility	57 (17.2%)
One-Year KOOS-JR	76.4 ± 13.2
One-Year KOOS-JR Change	24.4 ± 15.5
Achieved MCID[f]	139 (40.1%)
Total Implant Cost ($)	4017.56 ± 1187.42

Categorical data presented as N(%). Continuous data presented as mean ± S.D.
[a]TKA = Total Knee Arthroplasty; [b]BMI = Body Mass Index; [c]ASA = American Society of Anesthesiologists; [d]KOOS-JR = Knee Injury and Osteoarthritis Outcome Score Joint Replacement; [e]LOS = Length of Stay; [f]MCID = Minimum Clinically Important Difference