

## **The Relative Effect of Surgeon vs. Prosthesis on Revision Rates of Primary Total Knee Arthroplasty**

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### **INTRODUCTION:**

Innumerable factors influence the likelihood of revision after total knee arthroplasty (TKA). Surgeon performance and prosthesis choice receive much attention, with little data on the relative importance of each. This study compares surgeons with the lowest and highest revision rates, when they use prostheses of different performance outcomes.

### **METHODS:**

The two-year cumulative percent revision (CPR) for all primary TKA surgeries performed for osteoarthritis between 1999 and 2019 was extracted from a National Joint Replacement Registry and used to rank surgeon performance. The lowest and highest revision rate (LRR and HRR) surgeon quartiles were selected for comparison. All surgeries were further stratified by prosthesis performance (independent of surgeon): i. superior performing prostheses (SPP) (lowest revision rates), ii. identified prostheses (IP) (highest revision rates), and iii. middle performing prostheses (MPP) (neither identified nor superior performing). The primary outcome measure was time to first revision for LRR and HRR surgeons using SPP, MPP, and IPs. The secondary outcome measure was mode of failure.

### **RESULTS:**

The study included 100,110 primary TKA procedures. Surgeons in the LRR quartile had a lower CPR than surgeons in the HRR quartile irrespective of prosthesis used, at every year following surgery, reaching statistical significance when both groups used SPPs (0-2Yr HR 6.77 (95%CI 5.70-8.03),  $p < 0.001$ ; 2Yr+ HR 3.00 (95%CI 2.49-3.62),  $p < 0.001$ ), and MPPs (0-1.5 Yr HR 6.53 (95%CI 5.27-8.11),  $p < 0.001$ ; 1.5-2YrHR 5.12 (95%CI 3.24-8.11),  $p < 0.001$ ; 2Yr+HR 2.26 (95%CI 1.83-2.79,  $p < 0.001$ ). All surgeon groups had lower revision rates when they used SPPs. This advantage was larger for the LRR quartile (2.5Yr+ HR 1.49 (95% CI 1.17-1.90)  $p = 0.001$ ) than the HRR quartile (HR 1.11 (95%CI 1.01-1.22),  $p = 0.037$ ).

### **DISCUSSION AND CONCLUSION:**

The multifaceted role of the surgeon exerts a greater effect on TKA revision rates than the choice of prosthesis. LRR surgeons receive greater benefit from using superior performing prostheses than HRR surgeons.