

## **The 20-Year Cost of Posttraumatic Total Knee and Hip Arthroplasty in New Zealand**

Katarina Sim, Mark Zhu, Simon Young

### **INTRODUCTION:**

Individuals with significant trauma of the hip and knee often receive total knee (TKA) and total hip arthroplasty (THA) as definitive end-stage procedures. In New Zealand, all injury-related medical and surgical costs, rehabilitation, and social supports including workers' compensation, is funded by the Accident Compensation Corporation (ACC) without exception. Existing literature suggest that individuals receiving workers' compensation have significantly increased healthcare costs, delayed return to work, and overall poorer outcomes. Using a comprehensive ACC database, the purpose of this study was to clarify the characteristics and cost of posttraumatic TKA and THA in New Zealand.

### **METHODS:**

ACC records from 1 January 2000 to 31 December 2020 were queried to identify all cases of ACC funded TKA and THA. This data was matched to New Zealand Joint Registry (NZJR) records to obtain patient demographics and outcomes, including revision. Total cost was subcategorized into social (inclusive of workers' compensation and rehabilitation) and medical cost. Negative binomial regression was used to evaluate the relationship between demographic factors and cost of procedure. Logistic regression was used to evaluate the relationship of demographic factors and clinical variables on overall cost and odds of needing more than 6 months of workers' compensation.

### **RESULTS:**

Over 20-years, ACC funded 10,179 primary TKA and 5,611 primary THA, amounting to 918 million New Zealand Dollars (NZD) / 576 million USD. The mean total cost was NZD 56,717 per TKA (range: \$17 – \$2,029,564) and NZD 60,787 per THA (range: \$17 – \$4,762,755). The average yearly increase in cost was 12.2% for TKAs and 12.6% for THAs.

Mean age at procedure was 60.5 years for TKA and 62.9 years for THA. For TKA, Male gender (RR 1.27, 95% CI 1.14-1.4), higher levels of deprivation (RR 1.51, 95% CI 1.28-1.78), and heavier work types (RR 1.98, 95% CI 1.77-2.22) were associated with significantly higher total cost ( $p < 0.001$ ). Comparatively, THA variables associated with higher total cost ( $p < 0.001$ ) were male gender (RR 1.68, 95% CI 1.44-1.96) and heavier work types (RR 2.37, 95% CI 1.93-2.92) only.

Two thirds of social cost was workers' compensation. Some 21% of TKAs and 12% of THAs required more than 6 months workers' compensation support. For both TKA and THAs, younger age was associated with increased risk ( $p < 0.001$ , RR 1.04/yr), alongside Male sex ( $p < 0.001$ , TKA: RR 1.60/ THA: RR 1.44) and heavy work-types ( $p < 0.001$ , TKA: RR 1.92 / THA: RR 2.54).

### **DISCUSSION AND CONCLUSION:**

This is the first comprehensive nationwide study assessing the cost of posttraumatic lower limb arthroplasty. Overall costs are rising rapidly and are a significant burden on the health system. Social costs contribute to a significant proportion of expenditure, highlighting the need to focus on injury prevention, targeted interventions to assist with reintegration into workforce, and reduction in overall compensation time. This approach needs to target younger, male clients in heavy work types.