

Estimating Two-year costs of Periprosthetic Joint Infection Treatments in 690 Arthroplasty Patients

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INTRODUCTION:

Periprosthetic Joint infection (PJI) treatment is highly variable and includes suppressive antibiotic therapy, debridement, antibiotics and implant retention (DAIR), and single- or two-stage revision procedures. In addition to impaired quality of life and joint function, PJI is costly to treat. However, there are few studies which compare the costs of treatments for PJI across multiple hospitalisation episodes or acknowledge the importance of early management decisions on total costs. Data from The Prosthetic Joint Infection in Australia and New Zealand Observational (PIANO) cohort was used to (i) estimate the total costs of all hospitalisations for treating PJI in hips and knees up to the first two years post-diagnosis by treatment type and (ii) compare the total costs of cases who successfully received their initial planned treatment with those where the management strategy was changed.

METHODS:

PIANO admission and procedure data, combined with Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) data was used to assign diagnosis related group (DRG) to patients' episodes of care. The associated hospital costs were estimated using national weighted activity unit (NWAU) calculators from the Independent Health and Aged Care Pricing Authority (IHACPA). Total costs were calculated for the 24-month period post-diagnosis and comparisons of total costs for main treatment groups were done by T-tests with Welch's correction for parametric groups, and Mann-Whitney test for non-parametric groups. For multiple group analysis, the Kruskal-Wallis test was used.

RESULTS SECTION:

A total 291 and 399 participants with hip and knee PJI were analysed. The mean costs were dependent on the overall treatment approach. Two-stage revisions cost the most AU\$113,226 (US\$76,246) and AU\$121,706 (US\$81,957) for hips and knees, respectively. DAIRs cost \$53,537 (US\$36,052) (hips) and AU\$48,463 (US\$32,635) (knees). By contrast, managing patients with suppressive antibiotic therapy without surgical management was the least costly (AU\$20,296 (US\$13,667) and AU\$16,481 (US\$11,098)). For 65.5% of the cohort, the main treatment strategy over the subsequent 2 years matched their initial treatment plan. However, 27.2% and 28.5% of hip and knee patients that had DAIR as an initial management required further arthroplasty surgery, resulting in large increases in costs (147% and 142, respectively).

DISCUSSION:

The rising incidence of PJI is of interest in the orthopaedic and infectious diseases communities especially given inconsistent approaches to management and low treatment success. In this context, the associated costs of treatment should be an additional consideration in treatment decision making. Furthermore, PJI treatment can be ongoing for years, as multiple episodes of care lead to an increase in cost for each patient, furthering the burden on the healthcare system. Hence, the cost of subsequent reoperations beyond the first treatment is important.

SIGNIFICANCE/CLINICAL RELEVANCE:

PJI is complex and costly to treat, especially for patients with multiple or lengthy episodes of care and in those where a change to the initial management strategy is required. Health providers need to acknowledge that decisions taken early after diagnosis will impact treatment success rates as well as future PJI-related costs.

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IMAGES AND TABLES:

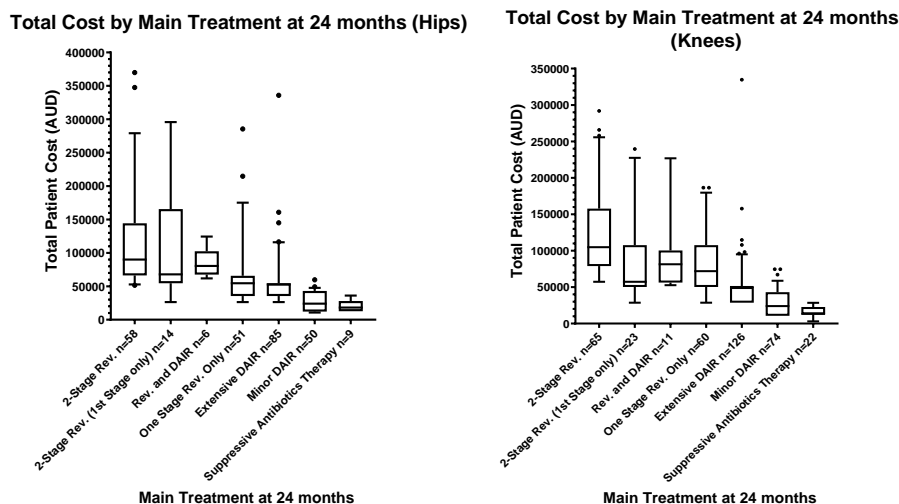


Figure 1: (A) Total Cost by Main Treatment at 24 Months (Hips); (B) Total Cost by Main Treatment at 24 Months (Knees)