

Economic Impact And Clinical Benefits Of Intraosseous Injections In Total Knee Arthroplasty

Introduction: Periprosthetic joint infection (PJI) following total knee arthroplasty (TKA) causes significant morbidity and incurs substantial economic burden on the healthcare system. Recent studies have demonstrated that intraosseous vancomycin (IOV) can reduce the rate of PJI in both primary and aseptic revision TKA when compared to intravenous vancomycin (IVV). This study evaluated the economic impact associated with IOV and IVV administration during primary and aseptic revision TKA.

Methods: Published institutional hospitalization cost data for PJI following TKA utilizing the Nationwide Inpatient Sample was adjusted to 2024 inflation rates to estimate the cost of a single PJI. Institutional costs for IOV and IVV were calculated using Medicare rates for CPT code 36680 as well as the costs of instrumentation, medications, and additional operating room time. Published 1-year PJI rates with IOV (primary 0.7%, aseptic revision 1.6%) and IVV (primary 1.8%, aseptic revision 4.9%) were used to calculate the number needed to treat (NNT) to prevent one PJI.

Results: The cost per-case was \$382.29 for IOV and \$3.90 for IVV. The inflation-adjusted cost per PJI was \$33,295.70. The NNT to prevent one PJI for primary TKA was 90.91 and 30.3 for aseptic revision TKA. Using IOV to prevent one PJI in primary TKA cost \$34,395.65 and \$11,465.22 in aseptic revision TKA. The cost savings in utilizing IOV to prevent one PJI at 1-year was \$21,830.48 in aseptic revision TKA. For primary TKA, utilizing IOV cost \$1,099.95 extra compared to the cost of PJI.

Discussion: Due to the rising healthcare expenditures and payer dissatisfaction with traditional models of reimbursement, there has been an increased focus on improving patient outcomes while minimizing costs. There is no question that PJI incurs a substantial cost burden and any measure to prevent this complication should be prioritized. This study is the first to analyze the cost-effectiveness of IOV administration in both primary and aseptic revision TKA. Our findings demonstrated a calculated costs savings of \$21,830.48 when regularly utilizing IOV to prevent one PJI in aseptic revision TKA. Our findings also demonstrated an added cost of \$1,099.95 to prevent one PJI in primary TKA.

Significance/Clinical Relevance: Utilizing IOV during aseptic revision TKA resulted in significant cost savings when compared to IVV. However, for primary TKA utilizing IOV resulted in additional \$1,099.95 compared to the cost of a single PJI. The economic impact of PJI may be greater if additional costs, such as specialist visits, postoperative rehabilitation, and quality of life factors, are factored in.