# Revision Total Joint Arthroplasty for Prosthetic Joint Infection at Centers of Excellence Decreases Risk of Complications and Improved Discharge Disposition Despite Further Travel Distance

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INTRODUCTION: Total Joint Arthroplasty (TJA) is a common and effective procedure for relieving pain and restoring function in patients with joint disease. However, complications such as periprosthetic joint infection (PJI), instability, and aseptic loosening can necessitate revision surgeries, which are complex and require increased resource utilization. PJI is the current leading cause of TJA failure and poses a significant treatment challenge, impacting patient outcomes and healthcare resources. The establishment of PJI “Centers of Excellence” (COE) at tertiary care facilities with fellowship-trained arthroplasty surgeons with experience in treating PJI has been advocated to provide patients access to care within their region. The authors’ large regional healthcare system introduced COEs for PJI several years ago to provide access and specialized care to these challenging patients. This study aims to compare the clinical outcomes and complication rates between patients treated for PJI at COEs versus non-COE hospitals within the same healthcare system.

METHODS: A retrospective cohort study between 2016-2024 was conducted using data from 598 patients treated at COE and 459 patients treated at non-COE for total hip and knee PJI. COEs within the authors’ institution are defined as hospitals that perform a high volume of arthroplasties and are recognized as tertiary, academic medical centers that employ adult reconstruction fellowship-trained orthopaedic surgeons. The COE group comprises three hospitals, while the non-COE group includes thirteen hospitals within the same healthcare system. An analysis of demographic variables, complications, readmissions, discharge dispositions, and patient-reported outcomes was completed. Travel distances were calculated using zip code analysis. The home zip codes at the time of TJA revision were compared to the hospital’s zip code, and distances were computed using latitude and longitude conversions using the haversine formula. Statistical analyses, including chi-square tests and T-tests, were used to compare proportions and mean values between the two groups.

RESULTS:

1057 patients were included in the study (495 total hip arthroplasty (THA) patients and 562 total knee arthroplasty (TKA) patients). The demographic profiles were similar between COE and non-COE groups, with no significant differences in gender distribution, racial composition, and proportion of primary THA and TKA ($p>0.05$). COE patients had a statistically significant lower risk of mortality (1.681 vs 1.874, $p<0.05$) and lower National Quality Forum (NQF) 1550 complications (27% vs 34%, $p<0.05$) and NQF 1550 sepsis (14% vs 20%, $p<0.05$). Discharge to skilled nursing facilities (SNF) was less frequent in the COE group (25% vs 37%, $p<0.05$), whereas discharge to home with home health agencies (HHA) was more common (58% vs 51%, $p<0.05$). There were significant differences in the average distance traveled by patients (32.16 miles for COE vs. 26.49 miles for non-COE, $p<0.05$). There were no significant differences in KOOS and HOOS scores between patients treated at COE and non-COE facilities. Preoperatively, COE patients had a mean KOOS of 48.42 and non-COE patients had 45.94 ($p>0.05$). One year postoperatively, COE patients had a mean KOOS of 69.23 compared to 65.36 for non-COE patients ($p>0.05$). For HOOS scores, COE patients had a preoperative mean of 57.45 and non-COE patients had 52.32 ($p>0.05$). One year postoperatively, COE patients had a mean HOOS of 73.44 compared to 79.54 for non-COE patients ($p>0.05$). PROMIS10 physical pre-scores were significantly lower in the COE group (45.47 vs. 48.05, $p<0.05$), though 1-year postoperative scores were similar. Additionally, readmission rates at 7, 30, and 90 days were comparable between COE and non-COE groups ($p>0.05$). The percentage of patients requiring 2 or more revisions and 3 or more revisions were identical between COE and non-COE patients (16% for 2 or more and 3% for 3 or more revisions $p>0.05$).

DISCUSSION AND CONCLUSION: Patients undergoing revision due to PJI at COEs travel further and experience improved outcomes, including lower complication rates and mortality risk, compared to those treated at non-COE institutions. Additionally, COE patients are less frequently discharged to skilled nursing facilities (SNF) and are more likely to be discharged to home HHA. These findings suggest that COE provides higher-quality care for complex PJI TJA cases, highlighting the importance of specialized regional centers for these challenging patients. Future studies may focus on identifying specific practices and protocols within COE that contribute to these improved patient outcomes, to apply these practices more broadly to enhance care quality across all institutions.