

## Differences in Comorbidities and Outcomes of Primary Total Joint Arthroplasty of the Hip and Knee Based on Referral Type at an Academic Center

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### Disclosures:

**INTRODUCTION:** Primary total joint arthroplasty (TJA) of the hip and knee are some the most successful and common orthopedic surgeries as they give patients pain relief and restore function. Total hip (THA) and total knee arthroplasty (TKA) make up a significant amount of yearly healthcare expenditures. Over the past decade, TJA surgeons have participated in value-based payment models to incentivize reducing cost for an episode-of-care (EOC), defined as the 90-day period following a procedure. Hospitals and physicians are reimbursed with a set fee for care during this time leaving the leaving the HC system to cover any costs related to services subsequent to the surgery within this timeframe. These efforts have been highly effective at reducing the cost of EOC, improving outcomes, and decreasing complication. However, recent target pricing methodology such as that put forth by Centers for Medicare and Medicaid Services (CMS) in the Bundled Payment for Care Improvement- advanced (BPCI-A) has decreased margins and physician reimbursement. There is concern that this has the potential to incentive surgeons to inappropriately refer more complex patients to academic tertiary care centers causing patients to experience more inconveniences post-surgical complications. This can potentially burden not only the tertiary care center but also the patient. This study sought to determine if patients undergoing TKA/THA have different comorbidities and complication rates based on referral type: referrals from non-orthopedic providers, self-referrals, and outside orthopedic referrals. Hypotheses include that patients with an outside orthopedic referral will have more comorbidities and higher rates of complications.

**METHODS:** This study was approved by our institutional review board. Records of patients referred for primary total hip or knee arthroplasty (THA, TKA) to a single tertiary care center from September 2019 to January 2020 were reviewed. Data included referral type, procedural details, primary insurance, demographics, Charleston Comorbidity Index (CCI), and American Society of Anesthesiology (ASA) classification. Additionally, complications following TJA were noted, including perioperative fracture, transfusions, surgical site infection, wound complications, unplanned antibiotics, prosthetic joint infection, instability, hip dislocation, pulmonary embolism/deep vein thrombosis, cardiovascular adverse event, revision surgery, number of admissions within 90 days of postoperative period, and total complication rate. A statistician performed ANOVA analysis, t-test, and chi-square.

**RESULTS SECTION:** In total there were 393 patients included in this study 249 (63%) were non-orthopedic referrals, 104 (26%) outside orthopedic referrals, and 40 (10%) self-referrals. Body mass index (BMI,  $p=0.02$ ), percent obese ( $p=0.005$ ), ASA score ( $p=0.006$ ), percent ASA score  $\geq 3$  ( $p=0.009$ ), length of stay ( $p=0.04$ ) and duration of surgery ( $p=0.01$ ) differed significantly between referral cohorts. Complications differed significantly by cohort in wound complications ( $p=0.045$ ), blood transfusions ( $p=0.027$ ), unplanned antibiotics ( $p=0.046$ ) and patients with  $\geq 2$  complications ( $p=0.001$ ).

**DISCUSSION:** This study compared patients who underwent primary THA and TKA at a tertiary care center based on referral type. Patients referred from outside orthopedic surgeon tended to be more complex given the higher BMI, percent obese, higher ASA score, longer duration of surgery and length of stay. These comorbidities are likely part of the reason for higher rates of complications such as unplanned antibiotics, wound complications, blood transfusion and people with more severe complications. While this data does validate orthopedic surgeons' ability to perform the "eyeball test," it simultaneously strengthens prior literature demonstrating local orthopedic surgeons tend to refer their more complex patients to tertiary care centers. Limitations of study are that it is unknown the motivating reason behind the referral. Additionally, it is impossible to retrospectively know whether the patient would have done better at their local orthopedic doctor versus going to a tertiary care center. However, it does show that tertiary care centers are being burdened with more complex patients by referral from local orthopedic surgeons.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study demonstrates local orthopedic surgeons are referring more complex patients to tertiary care centers, resulting in more severe post-surgical complications for the patients undergoing operation by tertiary care surgeons. Current reimbursement policies should be updated to risk stratify patients to avoid incentivizing referring complex patients inappropriately.