Coding Definition Choice Makes a Difference in Total Joint Arthroplasty Administrative Database Studies

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INTRODUCTION: While many total joint arthroplasty (TJA) studies identify cohorts from administrative databases with Current Procedural Terminology (CPT) codes, others use International Classification of Diseases Procedural Coding System (ICD-10-PCS) codes due to their increased granularity. However, ICD-10-PCS codes were implemented for inpatient services, and thus may introduce inherent biases when used to identify total hip arthroplasty (THA) and total knee arthroplasty (TKA) cases. This is particularly relevant as it is increasingly more common for TJAs to be performed in an outpatient setting.

METHODS:
From the 2021-2022 national insurance administrative dataset, adult patients who underwent THA or TKA were identified in one of two ways: using CPT codes or using ICD-10-PCS codes. Exclusion criteria included: concomitant trauma, neoplasm, or infection diagnosed within three months prior to surgery. Patient demographics and rates of 90-day postoperative adverse events were compared between cohorts.

RESULTS:
A total of 583,426 TJA (215,646 THA; 367,780 TKA) cases were identified based on CPT codes while 133,658 TJA (52,899 THA; 80,759 TKA) cases were identified with ICD-10-PCS codes. Compared to the CPT cohort, the ICD-10-PCS cohort was older with a higher comorbidity burden (Elixhauser Comorbidity Index) (p<0.001 for both).

Relative to the CPT cohort, patients identified by ICD-10-PCS codes demonstrated greater odds of the following 90-day postoperative adverse events for both TJA and TKA: transfusion, myocardial infraction, pulmonary embolus, deep vein thrombosis, sepsis, pneumonia, urinary tract infection, acute kidney injury, hematoma, wound dehiscence, surgical site infection, emergency department visits, hospital readmission, and revision (p<0.001 for all) (Figure 1).

DISCUSSION AND CONCLUSION: While many administrative database studies utilize ICD-10-PCS codes to define TJA cohorts, only a subset of CPT-coded TJA cases are identified in this manner. Reliance on ICD-10-PCS codes may introduce selection bias and should be used with caution. Controlling and matching may help mitigate this effect.

Figure 1. Incidence of Adverse Events In ICD-10-PCS Cohort Compared to CPT Definition For THA and TKA