

Can the American Joint Replacement Registry Utilize Administrative Claims Data to Accurately Classify Revision THA Procedures as Septic or Aseptic?

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INTRODUCTION: The American Joint Replacement Registry (AJRR) is a valuable tool for studying revision total hip arthroplasty (rTHA). Currently, International Classification of Diseases-10 (ICD-10) codes are utilized by AJRR for classifying surgical diagnoses. However, the accuracy of using ICD-10 data in this manner is unknown. The purpose of this study was to determine the accuracy of these codes, as used by AJRR, in classifying rTHA cases as septic or aseptic.

METHODS: 908 rTHAs performed from 2015-2021 at a single institution were included (13.3% septic). Revision diagnoses were obtained from our institutional total joint registry, in which trained abstractors prospectively record surgical diagnosis independent from ICD-10 data. ICD-10 diagnosis codes, as submitted to AJRR, were also retrieved for the same procedures. AJRR accepts ten ICD-10 codes for each procedure, with one code designated as principal diagnosis. Accuracy of these codes in determining septic versus aseptic rTHA was assessed based upon ICD-10 code specificity (PJI-specific-codes versus any-infection-related-code) and code position (principal-diagnosis versus any-submitted-diagnosis). Currently, AJRR classifies rTHA as septic if any-infection-related-code is present. Cohen's Kappa statistic was calculated to assess agreement.

RESULTS: Concordance between AJRR submitted data and our institutional database for classifying rTHA as septic or aseptic was excellent ($k > 0.80$) when querying for any-infection-related-code in either the principal-diagnosis (96.8%; $k = 0.86$) or any-submitted-diagnosis position (96.9%; $k = 0.87$). Accuracy fell and concordance was fair ($k = 0.40-0.59$) when querying only PJI-specific-codes in the principal-diagnosis position (90.1%; $k = 0.42$) or any-submitted-diagnosis position (91%; $k = 0.49$) due to more procedures being incorrectly classified as aseptic in the submitted AJRR data.

DISCUSSION AND CONCLUSION: AJRR submitted ICD-10 data correctly classifies the infection status of rTHA procedures with outstanding accuracy when querying for any-infection-related-code. These findings support AJRR's current diagnosis methodology and are important for researchers using administrative claims data as they must utilize any-infection-related-code, to best distinguish septic versus aseptic rTHA.