TITLE:Utilization of Postoperative Day 1 Laboratory Studies Following Primary Total Hip and Knee Arthroplasty: Are They Worth the Cost?

AUTHOR(S): Blinded Copy -- Leave Blank

AFFILIATION(S): Blinded Copy -- Leave Blank

Background: Total hip and total knee arthroplasty procedures have become increasingly more prevalent with more than 1 million estimated procedures performed in the United States in 2010 alone, and a projected estimated 4 million in 2030. As payers increasingly push for cost reduction methods, such as the Comprehensive Care for Total Joint Replacement, by using bundled payment systems, we must investigate ways to improve efficiency and reduce cost without sacrificing the quality of patient care. The goal of our study was to determine whether postoperative day one (POD1) laboratory studies, including complete blood count (CBC) and basic metabolic panel (BMP), after primary total hip or total knee arthroplasty provide clinical value that justifies their cost. Study Design: This study retrospectively reviewed patient charts who underwent a primary total hip arthroplasty (THA) or total knee arthroplasty (TKA) at Grandview Medical Center between January 1, 2015, and August 1, 2017. The primary objective was to determine if POD1 laboratory tests (including BMP and CBC) were used to drive clinical decision making. Our secondary objective was to determine preoperative and intraoperative factors which led to clinical POD1 medical interventions. Results: Overall, no patients received a transfusion based on POD1 laboratory findings. Administration of tranexamic acid reduced the TKA transfusion rate, but not in THA patients. The overall transfusion rates during episodes of care were 8.1% and 5.14% for THA and TKA respectively. Preoperative hemoglobin was a significant variable for predicting eventual transfusion during hospital stay for both surgeries. Increased age was a significant variable contributing to POD1 electrolyte abnormality corrections (EAC) in both THA and TKA patients. History of chronic kidney disease and myocardial infarction was positively correlated with acute kidney injury (AKI) in TKA patients, but not patients who underwent a THA. Conclusion: The CBC test ordered on POD1 was not found to be useful for the purposes of administering blood transfusions for THA and TKA patients. CBC studies ordered on POD1, testing for other purposes, should remain at the judgement of the provider. AKI and EAC interventions were more difficult to predict based on the assessed variables. Evaluating a combination of patient history, preoperative laboratory values, and age may prove useful to reduce the number of unnecessary BMP tests ordered POD1 following elective THA and TKA.
