

# Adverse Events in Patients with Chronic Kidney Disease Undergoing Distal Radius Fracture Open Reduction Internal Fixation: A Large Database Study

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## INTRODUCTION:

Distal radius fracture (DRF) is a common injury, for which open reduction and internal fixation (ORIF) may be considered. Such patients may have varying stages of chronic kidney disease (CKD), which may be associated with adverse outcomes. The current study aimed to characterize the postoperative course of DRF ORIF for patients with varying CKD severity compared to those without CKD. We hypothesized that CKD patients would have higher odds of infection and increased healthcare utilization, with greater CKD severity correlating with higher complication risks.

## METHODS:

Adult patients (>17 years) who underwent DRF ORIF from January 2010 through October 2021 were identified from the PearlDiver M157 administrative database. Exclusion criteria included inactivity or a history of neoplasm, infection, or other upper extremity trauma within 90 days prior to the index procedure. Patients with documented CKD were identified. The overall cohort was then categorized into groups: (1) CKD stage 1-3, (2) CKD stage 4, 5, or end-stage renal disease (ESRD) (stage 4-ESRD), and (3) no CKD.

Demographics, including age, sex, and Elixhauser Comorbidity Index (ECI), which quantifies comorbidity burden, were recorded. Ninety-day and 1-year complications were assessed and compared using Pearson's chi-squared test and multivariable logistic regression, controlling for age, sex, and ECI.

## RESULTS:

Overall, 33,049 DRF ORIF patients were identified. Of these patients, CKD stage 1-3 was identified for 656 (1.98%) and CKD stage 4-ESRD was identified for 247 (0.75%). Multivariable analyses showed CKD patients had increased odds of certain complications, including sepsis (stage 1-3 OR=5.85; stage 4-ESRD OR=47.65), cardiac events (myocardial infarction or cardiac arrest - stage 1-3 OR=8.50; stage 4-ESRD OR=28.68), venous thromboembolism (VTE; stage 1-3 OR=4.88; stage 4-ESRD OR=7.00), pneumonia (stage 1-3 OR=3.40; stage 4-ESRD OR=26.35), and readmission (stage 1-3 OR=1.86; stage 4-ESRD OR=4.61). There were no differences identified for 1-year complication rates (hardware removal and malunion/nonunion).

## DISCUSSION AND CONCLUSION:

The present study shows that CKD patients are at a staged risk of several complications following DRF ORIF, including sepsis, VTE, and cardiac events, even after controlling for patient factors (age, sex, ECI). These findings suggest that caution should be exercised when considering ORIF surgery for CKD patients with DRF, particularly for those with a higher disease burden.

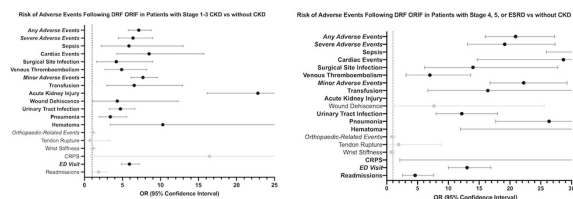


Figure 1. Risk of ninety-day adverse event following DRF ORIF for the specified CKD cohort compared to non-CKD patients. Black bars are significant, whereas grey bars are not.