

# Methylprednisolone Following Distal Radius Fracture Repair Is Associated with Reduced Opioid Prescriptions but Increased Early Postoperative Complications: A Propensity-Matched Analysis

Priyank P. Patel<sup>1</sup>, Sehajvir Singh<sup>1</sup>, Wali U. Pirzada<sup>2</sup>, Simran Shamith<sup>1</sup>, Kimberly Dong<sup>2,3</sup>, Asif M. Ilyas<sup>1,2,3</sup>

<sup>1</sup>Drexel University College of Medicine, Philadelphia, PA, <sup>2</sup>Rothman Institute for Opioid Research and Education, Philadelphia, PA, <sup>3</sup>Rothman Orthopaedic Institute, Philadelphia, PA  
PP827@drexel.edu

**Disclosures:** Priyank P. Patel (N), Sehajvir Singh (N), Wali U. Pirzada (N), Simran Shamith (N), Kimberly Dong (N), Asif M. Ilyas (N)

**INTRODUCTION:** Effective pain management following distal radius fracture (DRF) treatment with open reduction and internal fixation (ORIF) is crucial for patient recovery and minimizing opioid reliance. Previous studies have demonstrated methylprednisolone's efficacy in reducing opioid requirements. However, its role in postoperative management following DRF ORIF remains poorly understood. This study aimed to evaluate the impact of methylprednisolone use within the immediate postoperative period on opioid usage, medical outcomes, and surgical complications following DRF ORIF. The study hypothesis was that patients given methylprednisolone will experience reduced opioid requirements postoperatively without an increase in medical or surgical complications.

**METHODS:** The TriNetX Global Collaborative Network database was queried for adult patients, aged 18 years and older, with at least one year of follow-up data. Patients were stratified into two cohorts: those prescribed methylprednisolone within one week postoperatively, and a methylprednisolone-naïve control group. Exclusion criteria included prior methylprednisolone use and the absence of healthcare visits within ninety days postoperatively. Cohorts were matched for demographic variables, BMI, comorbidities, nicotine dependence, and medication use with propensity scoring. A total of 1,828 patients (1,001 female and 747 male) were analyzed after matching, 914 per cohort. Postoperative medical outcomes, orthopedic outcomes, and opioid prescription incidences were evaluated at 1 week, 2 weeks, 1 month, and 3 months, with significant differences identified by odds ratios (OR) and p-values ( $p < 0.05$ ).

**RESULTS SECTION:** Methylprednisolone recipients had significantly fewer opioid prescriptions at 3 months (1.54 vs. 2.14;  $p = 0.0152$ ). However, the methylprednisolone cohort had higher odds of hospital readmission at 1 week (OR 1.33;  $p = 0.013$ ) and 2 weeks (OR 1.29;  $p = 0.020$ ), and more emergency department visits at 1 week (OR 2.23;  $p = 0.032$ ). Respiratory failure was more common at 2 weeks (OR 2.54;  $p = 0.010$ ), 1 month (OR 2.69;  $p = 0.004$ ), and 3 months (OR 2.26;  $p = 0.010$ ). Pneumonia (OR 2.33;  $p = 0.022$ ) and acute renal insufficiency (OR 2.13;  $p = 0.046$ ) were also more frequent at 3 months. Wrist stiffness was significantly less likely in the methylprednisolone group at all time points.

**DISCUSSION:** This study indicates that postoperative administration of methylprednisolone following DRF ORIF was associated with a significant reduction in mean opioid prescriptions by 3 months, supporting its potential role in opioid stewardship. However, this benefit was accompanied by increased short-term medical risks, including respiratory and renal complications, hospital readmissions, and ED visits. These results support the potential selective incorporation of methylprednisolone into postoperative protocols, with appropriate early monitoring to mitigate potential complications. While propensity score matching was used to control for potential confounding variables, this study is limited by the use of the TriNetX research database. The de-identified nature of the TriNetX prevents the cross-referencing and ratification of opioid prescription data with official databases such as the Prescription Drug Monitoring Program, complicating the verification of prescription accuracy. The TriNetX database also lacks detailed clinical information which makes it difficult to determine whether observed outcomes are due to methylprednisolone use or other factors.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Amid efforts to curb postoperative opioid exposure after DRF ORIF, these real-world data show that early methylprednisolone use is associated with fewer opioid prescriptions and less wrist stiffness by 3 months, but higher short-term readmissions, ED visits, and respiratory and renal complications. These findings highlight the importance of weighing potential pain management benefits against medical risks when considering corticosteroid use in the postoperative setting.