

# **Persistent Racial Disparities in Postoperative Management after Tibia Fracture Fixation: A Matched Analysis of Medicaid Beneficiaries**

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## **INTRODUCTION:**

Racial and ethnic disparities in orthopaedic surgery are well documented. However, the granular extent to which these disparities persist in fracture care are not well understood, particularly in the context of the United States of America (US) payer system. This study sought to assess racial disparities in the postoperative surgical and medical management of patients after diaphyseal tibia fracture fixation.

## **METHODS:**

Patients with surgically treated tibial shaft fractures (Index=inpatient admission for fracture repair) from October 1, 2015, to December 31, 2020, were identified in a large Medicaid database. Exclusion criteria included concurrent fractures or an amputation at the index procedure. Outcomes included postoperative complication, reoperation, and filled prescription rates after fracture surgery up to 730 days (2 years) post-index. Covariates included patient demographics and comorbidities, fracture pattern and severity, and type of fixation. Descriptive statistics were conducted on all patients. For outcomes analyses, surgically-treated Black and White cohorts were propensity-score matched using nearest neighbor matching. Balance before and after matching was evaluated. Chi-square tests and survival analyses (Kaplan-Meier and Cox proportional hazard models) were conducted.

## **RESULTS:**

A total of 5,472 patients were included in this study, 2,209 Black and 3,263 White patients. Prior to matching, the Black cohort was younger (58.2% less than 35 years old in the Black cohort vs. 46.2% in the White cohort) and had a higher proportion of males (56.8% Black vs. 51.0% White cohort). Black patients also had higher rates of displaced, comminuted, and open fractures, compared to White patients. After matching, 2,209 were retained in each cohort. Balance in sex (56% male in each cohort), age (average age: 32.3 (SD 16.9)), and Elixhauser comorbidity index (approximately 1.4 (SD: 2.2)) was achieved. Postoperatively, no significant differences in complication rates were observed at 2 years between the matched Black vs. White cohorts. Differences in rates of reoperation, however, were observed, with a 28.5% reoperation rate (95% CI: 25.6%-29.9%) in Black patients and 35.5% rate (95%CI: 32.3%-37.0%) in White patients. Implant removal occurred in 17.9% (95%CI: 15.5%-19.1%) of Black patients and 25.1% (22.3%-26.5%) of White patients. Reoperations specifically for nonunion were reported in 4.5% (95%CI: 3.2%-5.1%) Black vs. 7.2% (95%CI: 5.5%-8.0%) White patients. From the Cox models, the adjusted hazard ratio for reoperation associated with White vs. Black race was 1.3 (95%CI: 1.2-1.5). Significantly greater proportions of White compared to Black patients filled at least one prescription for benzodiazepines, antidepressants, strong opiates, or antibiotics, at each timepoint post-index. By the 2-year timepoint, Black versus White utilization for these aforementioned medications was: 15.9% (95%CI: 13.6%-17.0%) vs. 31.2% (95%CI: 28.3%-32.7%) for benzodiazepines, 31.7% (95%CI: 28.7%-33.1%) vs. 47.8% (95%CI: 44.6%-49.4%) for antidepressants, 7.7% (95%CI: 6.0%-8.5%) vs. 16.1% (95%CI: 13.7%-17.3%) for strong opioids, and 68.2% (95%CI: 65.2%-69.7%) vs. 81.3% (95%CI: 78.8%-82.5%) for antibiotics. No differences were observed in proportion of patients with at least one prescription filled for non-steroidal anti-inflammatory drugs (NSAID) and other analgesics.

## **DISCUSSION AND CONCLUSION:**

Our study identified differences in postoperative management after surgical treatment of Medicaid-insured patients with tibial shaft fractures between Black and White patients. Despite having similar complication rates, Black patients were less likely to have reoperation within two years than White patients. Black patients were also less likely to receive prescription medications for infection, severe pain, sleep/anxiety, and depression. These results may be reflective of undertreatment or access issues unique to Black patients. Identification of factors driving differential management of complications after fracture surgery may be useful to promote health equity after trauma. This study underscores the need for further research and interventions to address racial disparities in orthopaedic trauma care.