# Opioid Prescription after orthopaedic trauma—at what threshold should I begin to be concerned?

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INTRODUCTION:
Orthopaedic injuries are painful and there are often patient- and surgeon-level factors that modulate opioid prescribing after traumatic injury. There is real variability among prescribing regionally. Furthermore, it is clear that there is greater postoperative opioid use in patients with psychiatric diagnoses, low-income status, and those with higher initial opioid use, among other risk factors. The aim of the present study was to identify threshold(s) that identify patients at increasing risk of having new onset issues with opioid dependence.

METHODS:
This retrospective study identified 175,799 patients in 2014-2020 large commercial claims dataset who had undergone orthopaedic trauma procedures with at least 2 year follow-up data. Those with preexisting opioid dependence diagnosis were excluded. Opioid prescription data during the 90 day postoperative window was converted to morphine milligram equivalents (MME). MME's prescribed were then compared across patients with subsequent diagnosis of opioid misuse and those without. Age, sex, and Elixhauser Comorbidity Index (ECI) were included in the multivariate analysis.
Youden J index was calculated for optimal cutoff of 90-day MMEs for subsequent opioid misuse diagnosis.
RESULTS:
Of 175,799 patients included in analysis, 1,421 (0.8%) developed subsequent opioid dependence. These patients were prescribed an average of 3 times the amount of opioids as those who did not develop opioid dependence (1753 vs. 548 MME, $p < 0.001$). Men and patients with increased comorbidities were more likely to develop dependence ($p<0.001$ for both). Older patients were less likely to develop dependence (OR = 0.98, 95%: 0.98-0.99, $p < 0.001$). Because comorbidities were significantly associated with risk of opioid dependence. 90-day MME threshold was stratified based on ECI. Threshold for ECI 0, 1-4, ≥5 were 660 MMEs (Sens. = 58%, spec. = 80%), 693 MMEs (sens. = 62%, spec. = 74%), 990 MMEs (sens. = 67%, spec. = 72%), respectively. All thresholds were associated with AUC of 0.7.
DISCUSSION AND CONCLUSION:
Patients who are prescribed more MMEs are at higher risk of developing a new diagnosis of opioid dependence. We identified a threshold of 660-990 MMEs, which is associated with increased risk of new diagnosis of opioid dependence (equivalent to 29-44 tablets 5mg oxycodone for 30 days, for example). At this threshold clinicians may consider methods to address risk of dependence.