

Postoperative Opioid Consumption Following Total Knee Arthroplasty Predicts Risk of Manipulation Under Anesthesia

Avinash S Iyer, David McCavitt, McKenzie Watts Culler, Ian Andrew Jones, Jay R Lieberman, Nathanael D Heckmann
INTRODUCTION: Manipulation under anesthesia (MUA) is performed to treat knee stiffness following total knee arthroplasty (TKA). Many surgeons have empirically noted limited pain tolerance to be a risk factor for MUA, however, there is limited data to link opioid consumption with the risk of MUA. The present study sought to examine the relationship between postoperative opioid consumption and risk of MUA.

METHODS: The Premier Healthcare Database (PHD) was queried to identify all patients who underwent primary, elective TKA from 2016-2023. Logistic regression was used to create restricted cubic splines describing the relationship between patient morphine milligram equivalent (MME) consumption on postoperative day (POD) 0 and risk of postoperative MUA within 90-days of surgery. Patients with no POD0 opioid exposure were excluded.

RESULTS: In total, 907,029 TKA patients were included. Of these, 14,177 (1.6%) underwent MUA. Patients who received an MUA, on average, received a significantly higher cumulative dose of opioids during their hospital admission (37.9 ± 24.2 MME vs. 35.4 ± 23.6 MME, $p < 0.001$). Restricted cubic spline modeling revealed a continuous relationship between MME and risk of MUA, corresponding to an approximate 2% increase in the relative risk of MUA for every 10 MME increment above the population average of 35.5 MME.

DISCUSSION AND CONCLUSION: The findings of the present study demonstrate a direct relationship between increased postoperative opioid consumption and risk of MUA. This association may serve as a tool to assist surgeons with postoperative patient counseling and rehabilitation planning.

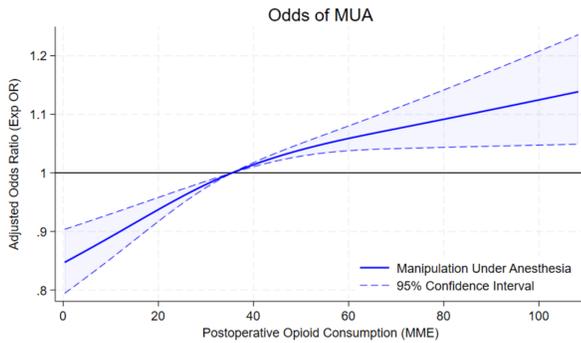


Figure 1: Restricted cubic spline with adjusted odds ratio (Exp OR) of 90-day manipulation under anesthesia risk by POD0 opioid exposure (in MME). The blue solid line denotes the adjusted OR calculated using multivariable logistic regression with the application of restricted cubic splines. The blue dashed lines indicate the 95% CI of the predicted aORs. The reference point was the calculated average opioid exposure (35.5 MME) for patients on POD0.