

Introduction

Postoperative pain after total knee arthroplasty (TKA) remains a barrier to early mobilization, same-day discharge, and patient satisfaction. Although multimodal analgesia and ERAS pathways have improved recovery, moderate-to-severe pain remains common (1).

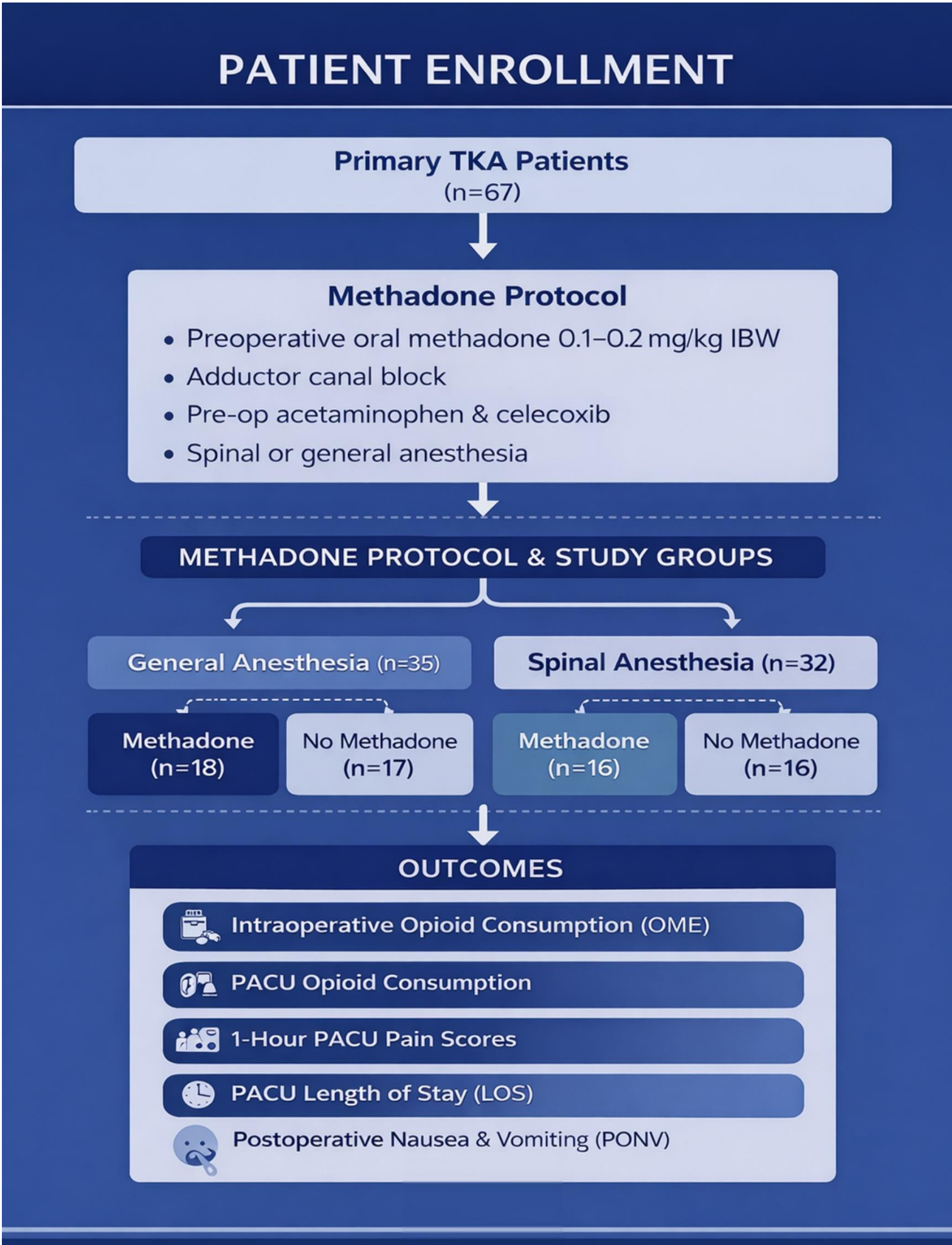
Methadone, a long-acting synthetic μ -opioid, has traditionally been used to treat opioid-use disorders, but emerging perioperative evidence suggests that methadone may provide more durable analgesia compared with short-acting opioids (2). Prior randomized studies indicate that a single intraoperative or preoperative dose of methadone can reduce opioid requirements and improve early postoperative analgesia (3).

As part of departmental initiatives to promote early ambulation following TKA, motivated by prior intravenous hydromorphone shortages, a protocol recommending preoperative oral methadone (0.2 mg/kg ideal body weight [IBW]) was implemented. In practice, administered doses ranged from 0.1–0.2 mg/kg IBW.

This quality-improvement initiative evaluated whether preoperative methadone is associated with reduced post-anesthesia care unit (PACU) length of stay (LOS).

Materials and Methods

- Per University of Pennsylvania policy, this quality improvement (QI) project was exempt from Institutional Review Board review.
- Data was collected for all patients undergoing primary total knee arthroplasty (TKA) at our institution over a 4-week period.
- Exclusion criterion: patients directly admitted to the ICU based on preoperative risk assessment.
- Continuous variables were analyzed using two-tailed t-tests, and categorical variables using Fisher’s exact test.
- $p < 0.05$ was considered statistically significant. However, because this was a quality improvement study, p-values are reported for descriptive purposes only and not for hypothesis-driven inference.



Results

The average age, Body mass Index (BMI) and ASA status of all 67 patients included in the study are 67.9 years +/- 6.8, 34.2kg/m²+/- 9.2 and 2.7+/-0.4.

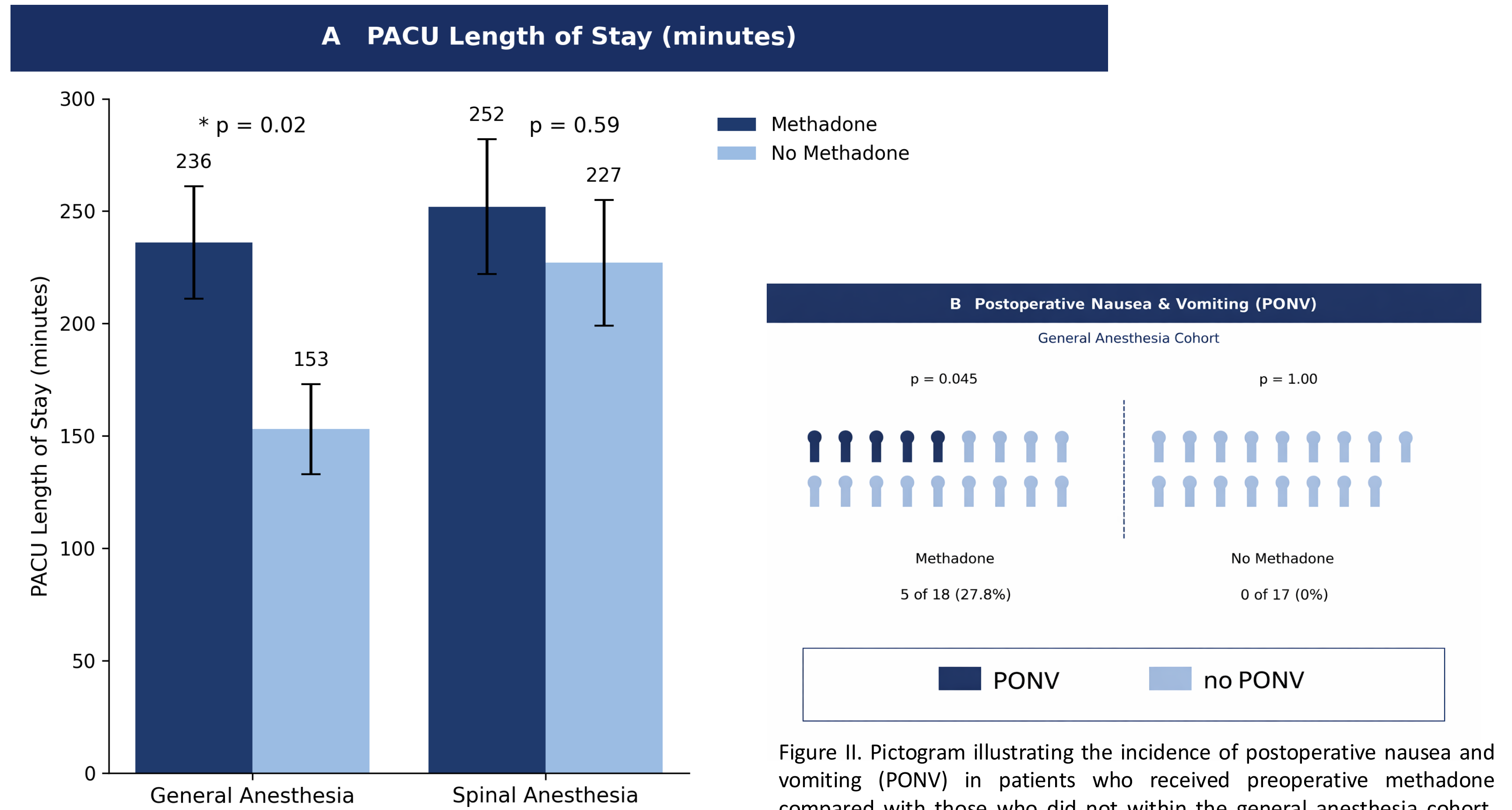


Figure I. Comparison of PACU length of stay (minutes) between methadone and no-methadone groups in patients undergoing general anesthesia and spinal anesthesia.

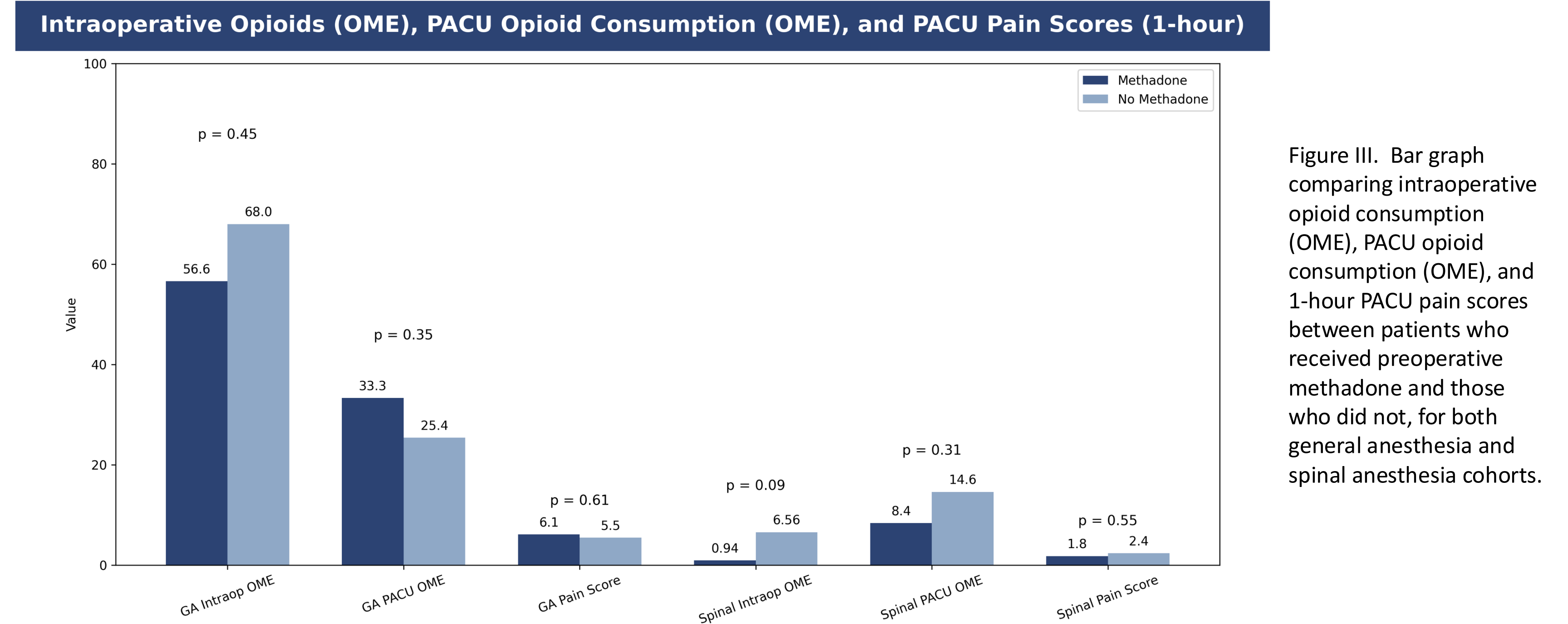
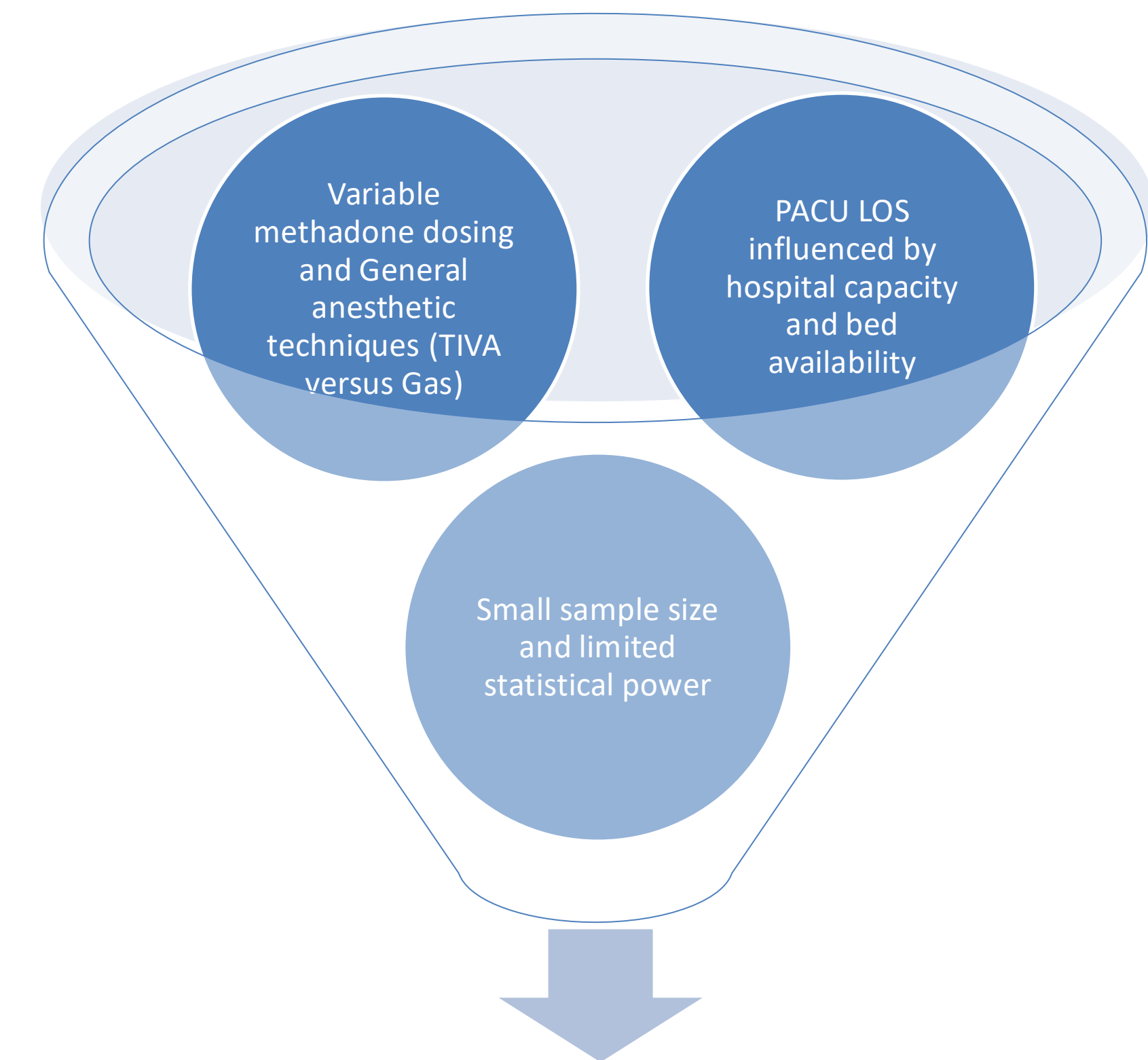


Figure III. Bar graph comparing intraoperative opioid consumption (OME), PACU opioid consumption (OME), and 1-hour PACU pain scores between patients who received preoperative methadone and those who did not, for both general anesthesia and spinal anesthesia cohorts.

Discussions

- Future Directions**
- Establish standardized PACU discharge criteria independent of bed availability.
 - Develop age- and weight-based methadone dosing tiers informed by current findings.
 - Standardize general anesthetic technique, with consideration of TIVA given increased PONV risk.
 - Conduct larger, adequately powered prospective studies to validate these results.



References

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