

BACKGROUND

- Our goal is to provide outstanding perioperative analgesia.
 - 80% of spine surgery patients report significant post-operative pain (most of which is moderate – severe in nature).
 - Analgesia extends beyond the OR.^{1, 2}
- Prevent opioid-induced respiratory depression.
 - The incidence of fatal post-operative respiratory depression is 1:75,000 surgical cases³
- Why Methadone?
 - Methadone has the longest duration of effect of any opioid (~3 days because of 1-3 day elimination t1/2)³
 - Methadone is a multi-modal analgesic, with u-opioid agonist activity, NMDA antagonist activity, and SNRI activity⁴
 - Compared to shorter-duration opioids, methadone results in decreased post-operative pain, less post-operative opioid use, and increased patient satisfaction.⁵
 - Methadone has been used effectively & safely for perioperative anesthesia and analgesia for 4 decades, and safely for outpatient surgery with minimal cross-tolerance.⁶

AIM STATEMENT

Our aim is to **increase the use of perioperative methadone** in patients undergoing orthopedic and neurosurgical spine procedures from 0% to 20% by April 2025 in Jennie Sealy Hospital in Galveston, Texas

DISCUSSION & NEXT STEPS

In line with current literature and other hospital's protocols in implementing perioperative methadone use, the UTMB Department of Anesthesiology has successfully employed our new protocol with compliance above 20%. The primary challenge faced was instructing residents/CRNAs on the inclusion criteria and execution of this protocol along with the surgical and PACU teams agreeing to our protocol for managing postoperative analgesia. The team will extend education efforts to preoperative day surgery nurses and postoperative care unit nurses to implement further methadone use and monitor the postoperative analgesia requirements respectively.

METHODS

Between February 2025 and April 2025, we presented literature evidence and a proposed Methadone protocol to the Anesthesiology Department, after notifying the surgical teams of the project. The QI Team was tasked with identifying qualifying patients based on the criteria for methadone implementation and notifying the perioperative teams. The data was then collected and analyzed using the PDSA QI Tool.

QUALITY IMPROVEMENT TOOLS



INTERVENTIONS

Methadone for Spine Surgery

AIM Statement: To increase the use of perioperative methadone in patients undergoing orthopedic/neurosurgical spine surgeries from 0% to 20% by April 2025 in Jennie Sealy Hospital in Galveston, TX.

Where to find it?

- PO 5 mg tablets
- Found in Holding or Centerwell Pyxis
- Pharmacy #: (409) 772-1171

PO Dosage

Dosing

- Same day discharge:** 0.15 mg/kg of IBW
- Inpatient discharge:** 0.25 mg/kg of IBW

Quick Summary

- Same day discharge:** Two 5 mg tablets
- Next day discharge:** Three 5 mg tablets
- Inpatient surgery:** Four 5 mg tablets

Instructions

- Patient Interview & Physical Exam in Holding to determine candidacy
- Acquire appropriate PO methadone in Holding Pyxis
- Anesthesiology Team administers PO methadone right before rolling to OR (patient to be on ASA monitors ASAP)
- DO NOT give ERAS medications, sedating anti-emetics, or Precedex (listed below) if giving methadone
- Chart administration on Epic Intraop Record
- Notify PACU nurse of methadone (patient should require less opioids post-operatively)

Facts

- T (1/2): 1-3 days elimination
- Multimodal medication
- Mu-opioid agonist, NMDA antagonist, SNRI
- Less post-op pain
- Less post-op opioid use
- Greater patient satisfaction

Inclusion Criteria

- Age Range:** 18 – 80 years old
- Procedure Type:** Orthopedic or Neurosurgical Spine Surgeries (recommend use in: same-day discharge, outpatient surgeries)
- Eligible Spine Surgeries Include (but are not limited to):**
 - Anterior Cervical Discectomy and Fusion (ACDF)
 - Anterior Lumbar Interbody Fusion (ALIF)
 - Anterior Cervical Fusion
 - Cervical Laminectomy
 - Cervical Thoracic Fusion
 - Corpectomy
 - Laminoplasty
 - Lumbar Decompression
 - Lumbar Fusion
 - Lumbar Laminectomy
 - Microdiscectomy

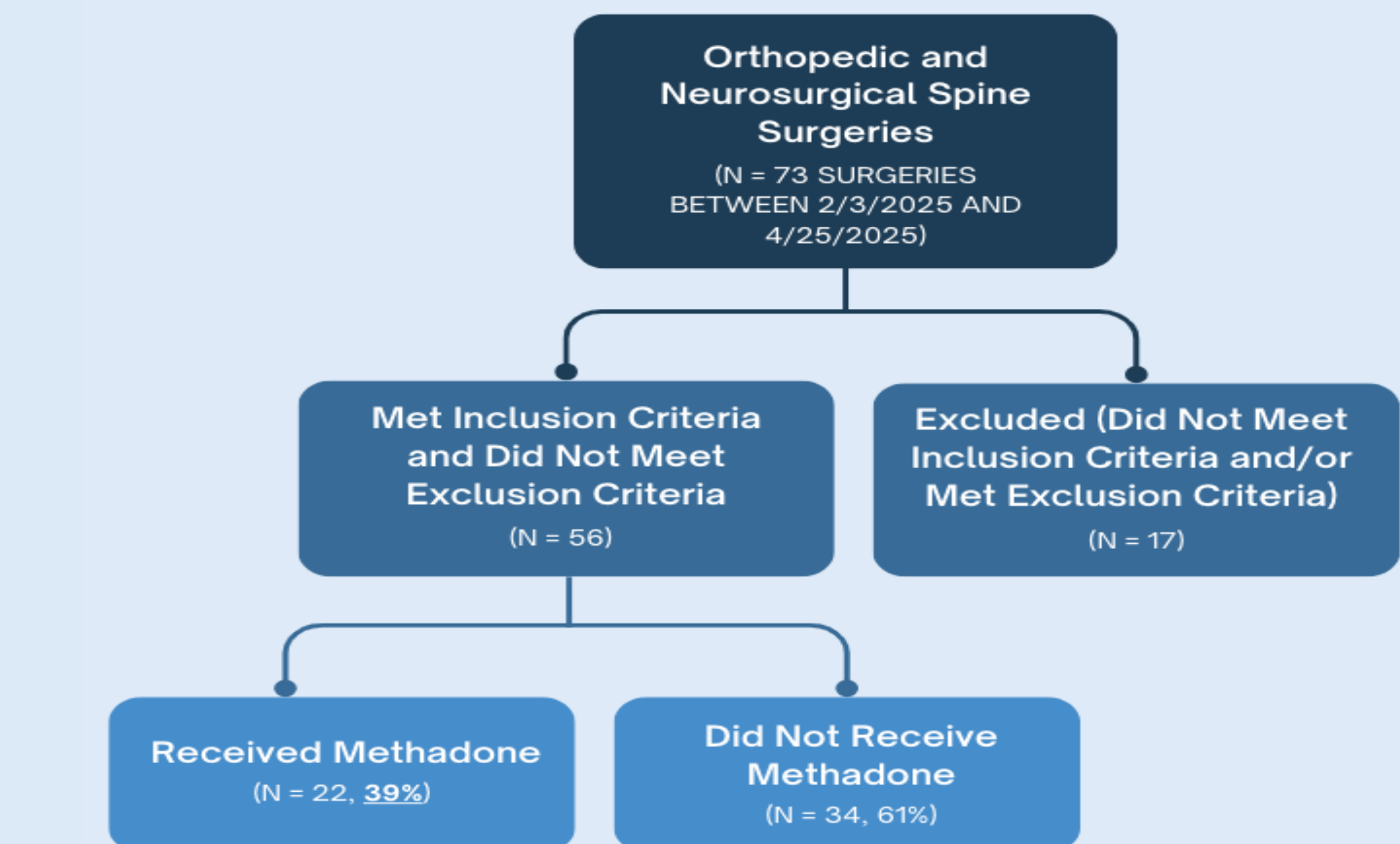
Exclusion Criteria

- Age <18 y/o or >80 y/o
- ASA 4 or ASA 5
- Pregnant or Nursing Females
- Morbid obesity (BMI>40)
- Pre-operative CKD Stage 3+ or Creatinine >2 mg/dL
- Pulmonary Disease Requiring O₂
- Significant Liver Disease (Cirrhosis, Hepatic Failure)
- PMHx of Serotonin Syndrome, Prolonged QTc Syndrome, Pre-operative Alcohol or Illicit Substance Abuse, and Previous MI or CHF
- Opioid Tolerant Patients for Same-day Discharge Surgery (Daily Methadone, >20 mg/day Oxycodone or Hydrocodone, or Fentanyl Transdermal Patch)
- If you give methadone, DO NOT give:**
 - Pre-op ERAS medications** (Gabapentinoids, Benzodiazepines, Muscle Relaxants, Antidepressants)
 - Sedating Post-op Anti-emetics** (Diphenhydramine, H1-blockers, Phenothiazines, Dopaminergics)
 - Dexmedetomidine** (due to possible sedating effects)

FAQs

- Renal dysfunction? **Safe**, <20% is eliminated renally
- OSA? **Safe**, no evidence of increased sensitivity to methadone
- Causing serotonin syndrome? **Safe**, unless on chronic oral methadone OR PMHx of serotonin syndrome
- QT prolongation and torsades de pointes? **Safe**, risk is low. DO NOT use if PMHx of Prolonged QTc or TP
- PO metabolism variable? **Safe**, not clinically meaningful

RESULTS/FINDINGS



REFERENCES

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3. Ramiah, Vign and Evan Kharsani. Methadone and Intraoperative Analgesia: Concepts and Protocols. Anesthesia and Analgesia. 2020 Sep 1;130(3):674-674
4. Bhatti et al. Opioid analgesia in non-competitive N-methyl-D-aspartate (NMDA) antagonists. Biochemical Pharmacology. Volume 56, Issue 5, 1 September 1998.
5. Murphy, et al. Post-operative Pain and Analgesic Requirements in the First Year after Intra-operative Methadone for Complex Spine and Cardiac Surgery. Anesthesiology. 2020, 132: 530-42.
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