

Evaluating the Adherence to Anesthesia Practices of Enhanced Recovery after Cesarean Delivery Recommendations at a Midwest Community Hospital



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Aims of the Project

- Centered on evaluating ERAC interventions that could be executed, managed, or influenced by anesthesia providers
- Assess and compare current practices to the most recent ERAC evidence-based guidelines at Midwest community hospital
- Evaluate the effect on inpatient opioid use and pain scores among c-section patients

Background & Significance

- Cesarean surgeries (c-section) account for **32% of all births in America**
 - Projected to increase to **29% globally** by 2030
- 85%-95% of c-section** patients are prescribed opioids upon discharge
 - Associated with adverse side effects: nausea, vomiting, pruritus, and decreased ambulation
 - Can interfere with both the patient's recovery as well as their ability to care for their newborn
- A retrospective study of **804,752 c-section** patients under neuraxial anesthesia (2008-2018)
 - only **6.1%** received the recommended neuraxial morphine, NSAIDs, and acetaminophen
 - increasing from **1.3%** in 2008 to **15.0%** in 2018
- Despite improved compliance over the years, this percentage is still low, indicating a need for better ERAC implementation protocols
- The rise in cesarean section rates, along with varying provider practices and opioid prescription patterns, suggests that better adherence to evidence-based recommendations could help mitigate the opioid epidemic in Cook County, where drug-induced overdoses have resulted in **4,467 deaths**

Methods

Background Research

- Evidence pertaining to current ERAC recommendations was assembled, appraised, and synthesized
- Established 17 ERAC parameters pertaining to anesthesia

Data Collection

- Retrospective data collected manually from **80 patient charts** of elective c-sections

Grouping & Comparison

- Formed three groups
 - Group A: 17 patients received 6-9 ERAC parameters
 - Group B: 55 patients received 10-11 ERAC parameters
 - Group C: 8 patients received 12-13 ERAC parameters

Results & Analysis

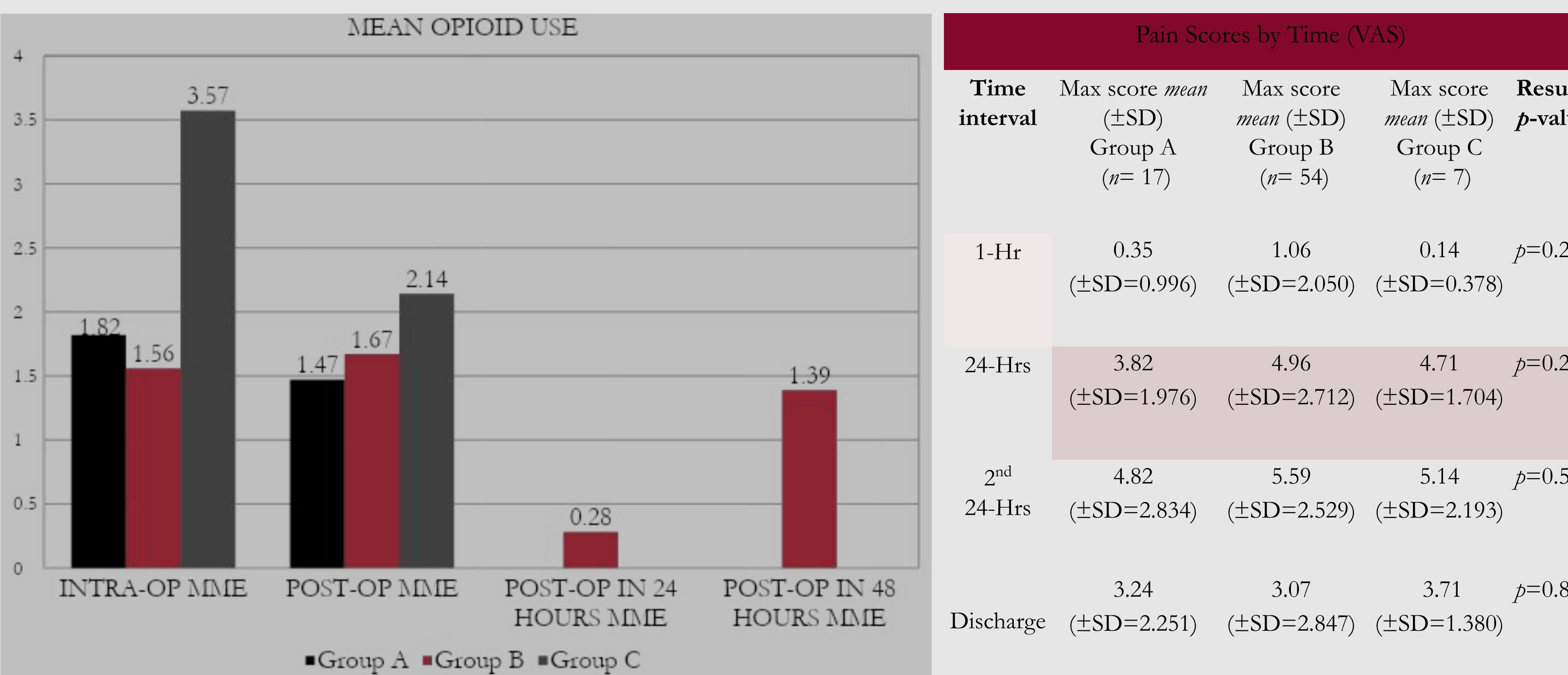
- Data analyzed with Microsoft Excel SPSS
- Primary and secondary outcomes were compared among the three groups using ANOVA and Wilcoxon Signed Ranks

Current ERAC Recommendations

Preoperative	Intraoperative	Postoperative
<ul style="list-style-type: none">MetoclopramideSodium citrate antacidsH2 Blocker PepcidNon-opioid analgesic (gabapentin, acetaminophen)	<ul style="list-style-type: none">Neuraxial AnesthesiaEpidural or Intrathecal duramorphIV fluid loadingNon-opioid IV analgesicTwo antiemeticsFluids <3 LitersActive Warming (fluid warmer, forced air warmer, warm blankets)Regional adjuncts for patients who received GA: local anesthetic infiltration, Transverse Abdominis Plane blocks, Quadratus Lumborum (QL) block	<ul style="list-style-type: none">First-line treatments with non-opioid analgesics, followed by low-dose, short-acting, low-potency opioidsScheduled non-opioid analgesics (acetaminophen, ibuprofen, ketorolac)



Results



Pain Scores by Time (VAS)				
Time interval	Max score mean (±SD) Group A (n=17)	Max score mean (±SD) Group B (n=54)	Max score mean (±SD) Group C (n=7)	Results p-value
1-Hr	0.35 (±SD=0.996)	1.06 (±SD=2.050)	0.14 (±SD=0.378)	p=0.219
24-Hrs	3.82 (±SD=1.976)	4.96 (±SD=2.712)	4.71 (±SD=1.704)	p=0.269
2nd 24-Hrs	4.82 (±SD=2.834)	5.59 (±SD=2.529)	5.14 (±SD=2.193)	p=0.545
Discharge	3.24 (±SD=2.251)	3.07 (±SD=2.847)	3.71 (±SD=1.380)	p=0.828

- Group C had the lowest mean pain scores at 1 hour postoperatively
- Group A recorded the lowest pain scores during the first 24 hours post-surgery
- By the second 24-hour period, pain scores were relatively similar across all groups
- Group B reported the lowest pain scores at discharge
- These findings suggest that greater adherence to ERAC guidelines may improve pain control at specific intervals

- Statistically significant difference between max pain scores in the 2nd 24-hour period between patients who received varying doses of neuraxial fentanyl and those did not receive fentanyl (p=0.038)
- Statistically significant difference in mean max pain scores 24-hours post op between patients who received neuraxial duramorph and those who did not receive duramorph (p=0.032)
- Higher intraoperative opioid use with no neuraxial duramorph (p=0.005)

Compliance with Recommendations

Preoperative Recommendations	Administration Rate, n (%)
Gabapentin PO	0 (0%)
Acetaminophen (PO/PR)	67 (84%)
H2 Blocker	1 (1%)
Metoclopramide	1 (1%)
Bicitra	69 (86%)

Intraoperative Recommendations	Administration Rate, n (%)
Neuraxial Anesthesia	*78 (98%)
Duramorph (IT/Epidural)	75 (94%)
Fluid preload/co-load	**79 (99%)
Ketorolac	27 (34%)
Multimodal antiemetic (zofran+decadron/other)	20 (25%)
Fluids <3L	79 (99%)
Active Warming	22 (28%)
Regional (TAP/QL Block if GA used ***n=2)	***1 (50%)
Local Infiltration	0%

Postoperative ERAC Parameters	Administration Rate, n (%)
Scheduled Ibuprofen PO	79 (99%)
Scheduled Ketorolac IV	80 (100%)
Scheduled Gabapentin PO	80 (100%)
Scheduled Tylenol PO	79 (99%)
TOTAL (17)	

Note. ERAC = Enhanced recovery after cesarean delivery; PO= oral; PR= rectal; IV= intravenous; L= Liters; TAP=Transverse Abdominis Plane; QL= Quadratus Lumborum; Intrathecal= IT; H2 blocker= histamine type 2 receptor antagonist; * = two patients received general anesthesia due to failed neuraxial techniques; **= received preloading; *** = two patients received general anesthesia, one out of these two patients received a TAP block.

Areas for Improvement

IT Morphine	Max pain scores lower 24-hours postop with IT morphine vs without <ul style="list-style-type: none">Variability IT morphine dosing among providers
Regional	TAP block on GA patients (50%) <ul style="list-style-type: none">0% surgical site local infiltration
PONV	25% received >2 agents for PONV <ul style="list-style-type: none">Full stomach & aspiration pneumonitis prophylaxis - 1% received an H2 blocker and metoclopramide preoperatively
Non-Opioid Analgesics	Early IV NSAID (34%)
Active Warming	Active warming (28%)

Conclusion

Future work could aim to provide educational opportunities to establish more consistent practices, greater adherence to best practice recommendations, and implementation of a formal ERAC protocol.

References

