



## Abstract

- The goal of this evidence-based quality improvement (QI) project was to assess anesthesia providers' current practices involving ketamine and improve anesthesia providers' knowledge regarding the benefits of perioperative ketamine administration for surgical patients with a history of opioid use.

## Purpose/Objective

- Deliver informative educational session to anesthesia providers
- Measure subjects' understanding of the information with pre- and post-surveys
- Analyze surveys to determine if educational session was effective in improving provider knowledge and willingness to use ketamine

## Background/Significance

- Many surgical patients have history of opioid use
  - 23% of surgical patients at an academic medical center reported preoperative opioid use (Hilliard et al., 2018)
- Chronic opioid use is associated with negative outcomes for surgical patients
  - Increased pain sensitivity (hyperalgesia), decreased efficacy of analgesics (Tornøe et al., 2023; Samuelsen et al., 2017)
  - Persistent postsurgical pain (Hyland et al., 2020), longer hospital stays, higher rates of readmission, increased healthcare expenditures (Waljee et al., 2017)
- NMDA receptor is associated with chronic pain pathway, "wind-up" phenomenon and development of opioid-induced hyperalgesia (Bordi, 2023)
- Ketamine antagonizes the NMDA receptor (Bordi, 2023)
  - Shown to significantly reduce postoperative opioid consumption in patients with history of chronic opioid use (Kreutzweiser & Tawfic, 2019)
- Literature review conducted to assess efficacy of ketamine for patients with a history of opioid use
  - Twelve articles included
  - Findings support use of subanesthetic doses of ketamine in the perioperative period
  - Shown to decrease opioid consumption and pain scores for first 24 hours after surgery, if not longer (Li & Chen, 2019; Meyer-Friessem et al., 2022).
  - Reduction in opioid-related side effects further emphasizes benefits of perioperative ketamine administration

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## References



## Methods

- Project Design:**
  - Pre-survey and post-survey methodology to evaluate impact of asynchronous, recorded educational presentation session
- Assessment Tool:**
  - 10 paired Likert-scale statements used to assess anesthesia providers' opinions and beliefs regarding ketamine, multimodal analgesia, and patients with history of chronic opioid use
  - Identical on both pre-survey and post-survey to measure change after educational session
  - Demographic information also collected
- Participant Involvement:** 11 CRNAs participated and responded to the pre- and post-surveys

## Results

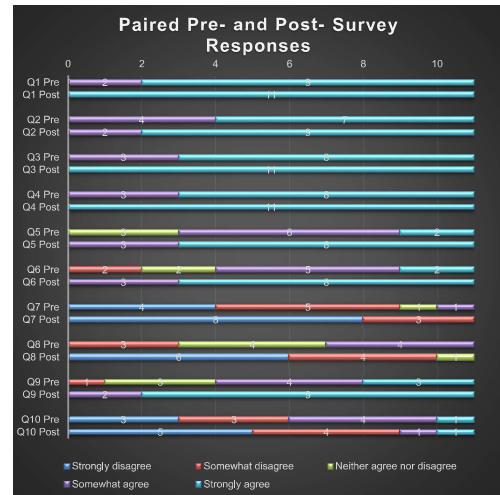


## Discussion

- Survey data suggests presentation was successful in creating statistically significant change in attitudes towards perioperative ketamine use
- Pre- and post-survey responses were compared using Wilcoxon signed-rank test
- Analysis revealed that responses to questions 5-10 showed statistically significant changes (p-values less than 0.05)
  - Indicates the educational session had meaningful impact on anesthesia providers' knowledge and willingness to utilize perioperative ketamine
- Responses to questions 1-4 did not show statistically significant changes (p-values greater than 0.05)
  - Questions 1-4 assessed background knowledge of opioid use and multimodal analgesia
    - Not specific to ketamine
  - May reflect providers' pre-existing familiarity with the material
  - Still demonstrated increase in knowledge from pre-survey to post-survey

### Paired Question Prompts

Paired Question 1	I believe it is important to know whether or not a patient has a history of using opioids.
Paired Question 2	If I learn that a patient has a history of opioid use, I should alter my anesthetic plan to include different medications besides additional opioids.
Paired Question 3	I believe that patients with a history of opioid use have a higher opioid requirement in the postoperative period.
Paired Question 4	I understand what is meant by the term "multimodal analgesia".
Paired Question 5	A single bolus dose of ketamine can significantly decrease postoperative opioid requirement.
Paired Question 6	I feel confident in my ability to appropriately dose sub-anesthetic ketamine as an analgesic adjunct.
Paired Question 7	The use of ketamine in multimodal analgesia is associated with an increased risk of respiratory depression.
Paired Question 8	Psychotomimetic effects such as hallucinations and dissociation are a significant concern with subanesthetic doses of ketamine.
Paired Question 9	The benefits of using ketamine outweigh its potential side effects in multimodal analgesia.
Paired Question 10	Administering ketamine is not worth the inconvenience of needing to waste unused drug in the chart/pyxis.



## Conclusion

- This QI project aimed to increase anesthesia providers' knowledge of benefits of perioperative ketamine administration for patients with history of opioid use
- Providers demonstrated solid baseline understanding of problems surrounding pain management for this patient population, but knowledge gaps existed regarding ketamine's role as a multimodal adjunct
- Educational session successfully addressed gaps in understanding, increasing provider knowledge and confidence in use of ketamine
- Statistically significant changes were observed in participant's responses from pre-survey to post-survey in all 6 questions related to ketamine