

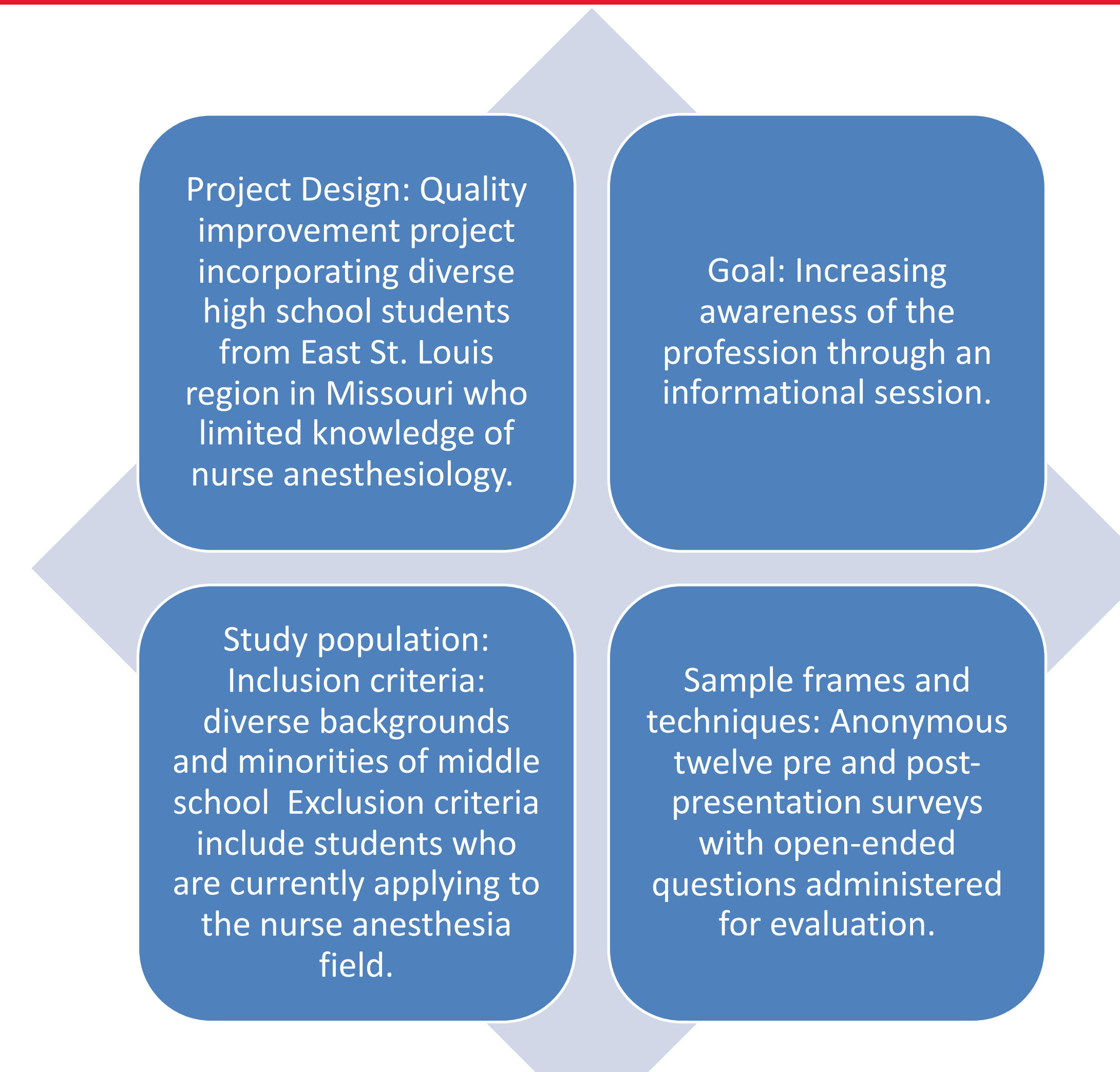
# Diversity, Equity, & Inclusion in Nurse Anesthesia: Bridging the Gap

Aminat Yusuff-Akinbo, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

- ❖ The United States Census shows there are 325 million residents of which 76.3% are white, 23.7% are of racial and ethnic diverse groups. White nurse anesthetists consist of 89% with only 10.9% of nurse anesthetists being from diverse racial backgrounds (Gould, 2021). This data demonstrates that the nurse anesthesia profession does not mirror the diversity in the population it serves.
- ❖ Lack of diversity limits cultural perspectives and experiences brought to patient care, perpetuating disparity in healthcare outcomes.
- ❖ This project aimed to raise awareness of the diversity gap in nurse anesthesia and increase awareness within the nurse anesthesia profession.

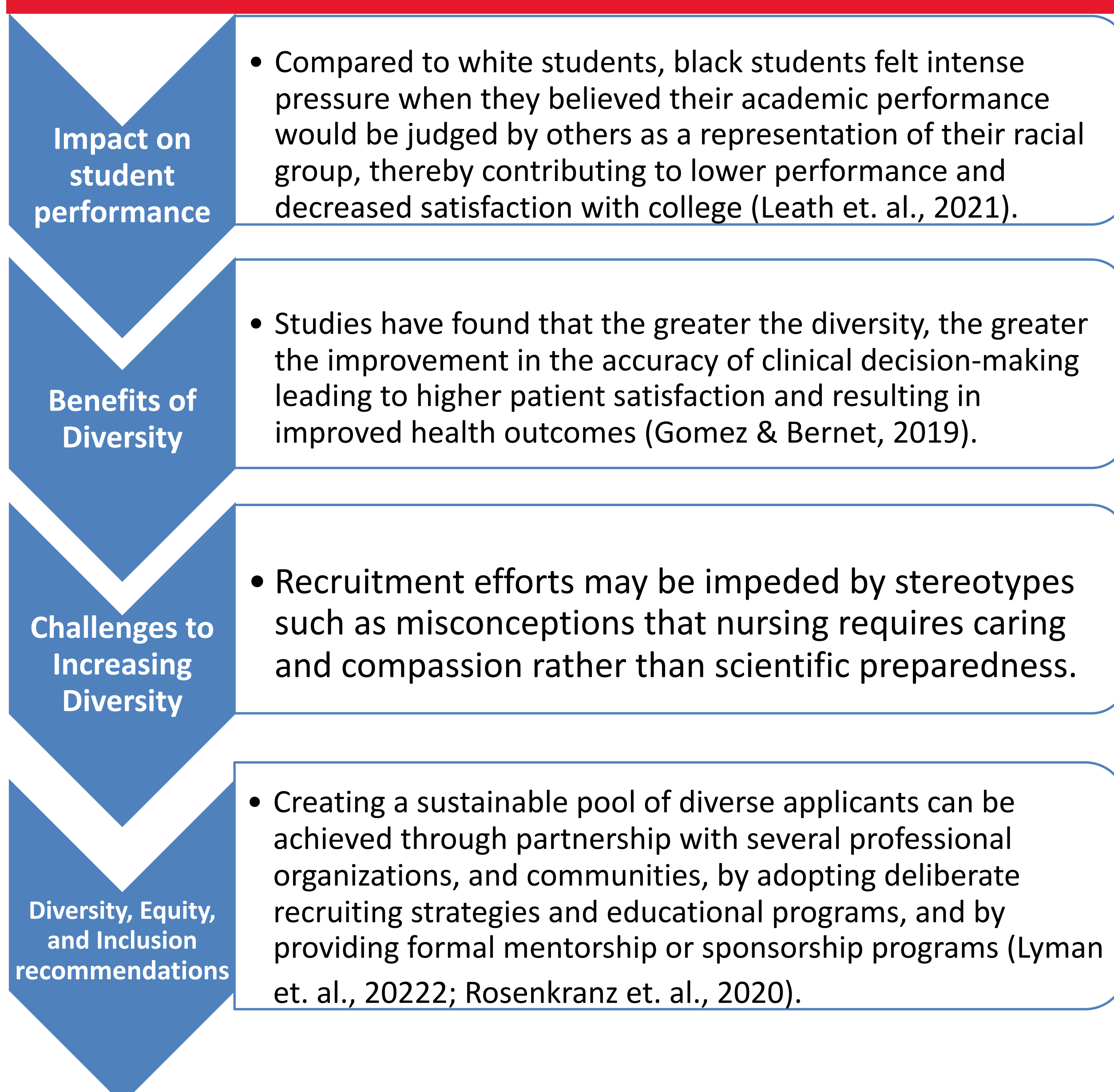
## PROJECT METHODS



## IMPACT ON PRACTICE

- ❖ Studies have found that the greater the diversity, the greater the improvement in the accuracy of clinical decision-making leading to higher patient satisfaction and resulting in improved health outcomes (Gomez & Bernet, 2019).
- ❖ Increasing awareness of nurse anesthesia among minorities can help address workforce shortages in the field.
- ❖ By attracting more individuals from minority backgrounds to the profession, the field can benefit from a wider pool of talent and perspectives.
- ❖ By increasing the representation of minorities in the nurse anesthesia profession, patients from diverse backgrounds may feel more comfortable seeking care and may receive more culturally competent treatment.

## LITERATURE REVIEW



## EVALUATION

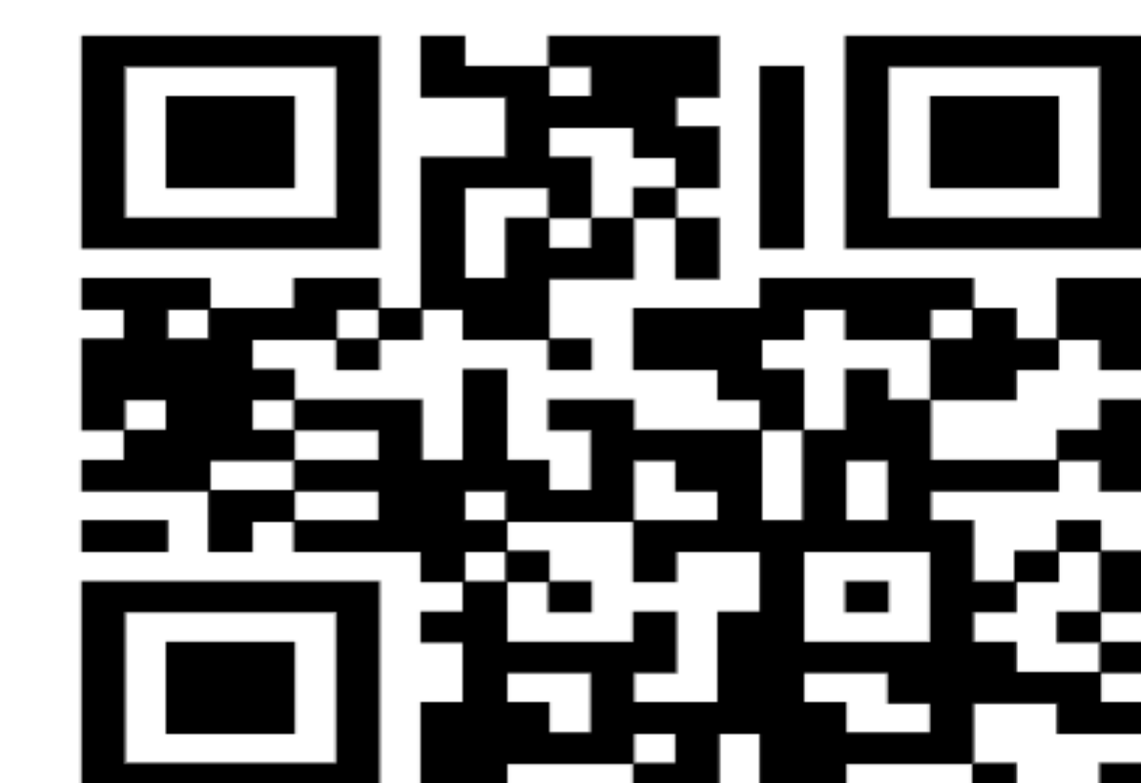
- ▶ The evaluation survey consisted of demographic information, five-point Likert scale questions that ranged from strongly agree to strongly disagree, and open-ended questions.
- ▶ The implementation sample included twenty-seven (n=27) high school students
- ▶ The results of the study indicated the informational presentation increased the participants' interest in learning more about the nurse anesthesia profession.
- ▶ A question and answer period was permitted for the participants following the presentation.

## CONCLUSIONS

Creating a population that understands how increasing diversity in healthcare provides a greater support system for the community.

Increasing awareness of the nurse anesthesia profession among minorities can improve healthcare access, outcomes, and workforce diversity. By promoting inclusivity and representation in the field, we can work towards a more equitable and effective healthcare system for all individuals.

## REFERENCES



# Utilization of High-Fidelity Simulation to Improve Emotional Intelligence Skills of Student Registered Nurse Anesthetists

Kaleigh Peters, BSN, SRNA & Melody Gassoway, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

- ❖ Providing safe, patient-centered anesthesia care is a tremendous responsibility for anesthesia providers, requiring control over the emotionally charged, high-stakes operating room (OR) environment.
- ❖ Emotions run high during critical moments of patient care, which can obscure logical thinking, impair communication, and create discontent among healthcare team members.
- ❖ The American Association of Nurse Anesthesiology (AANA) considers the ability to manage one's emotions a professional attribute that certified registered nurse anesthetists (CRNAs) should possess (2016).
- ❖ Salovey and Mayer, the leading researchers on emotional intelligence (EI), define EI as the ability to monitor one's own and others' feelings, discriminate among them, and use the information gained to guide one's actions and thinking (1990).
- ❖ Research demonstrates that elevated levels of EI contribute to the academic and clinical success of student registered nurse anesthetists (SRNAs) and improve patient safety and quality of care.
- ❖ Nurse anesthesia programs lack EI training in preparing SRNAs for the challenges they face during their rigorous doctoral training, which is vital to their future professional success as CRNAs.

## PROJECT METHODS

- Introductory seminar presented by an expert in emotional intelligence and Industrial-Occupational Psychology (IOP).
- Four active learning sessions corresponding to the four branches of Mayer and Salovey's ability-based emotional intelligence model presented by two student researchers.
- Implementation of a simulation experience involving eight groups of students rotating through three sessions (preliminary, high-fidelity simulation, and debrief).
- Post-simulation surveys distributed immediately following each debrief session.
- MSCEIT retaken by students.
- Post-clinical follow-up surveys distributed at the end of the students' first clinical rotation.
- Objective data analysis of pre- and post-intervention MSCEIT scores.
- Subjective data analysis of student feedback from the post-simulation and post-clinical follow-up surveys.

## IMPACT ON PRACTICE



## CONCLUSIONS

- ❖ MSCEIT results did not demonstrate any measurable, statistically significant increases in EI abilities.
- ❖ The benefits of implementing a high-fidelity EI simulation were revealed in debriefing sessions with the participants and survey results.
- ❖ Positive feedback supported the importance of including EI education in nurse anesthesia programs to promote student and professional success, career longevity, patient safety, and satisfaction.
- ❖ Early incorporation of EI simulation demonstrated that students focused more on anesthetic induction than the emotions and stress levels in the simulated OR environment.
- ❖ Incorporating EI simulation further into nurse anesthesia education provides SRNAs a degree of operating room exposure and relatable experiences to adapt to the changing environment.
- ❖ Each nurse anesthesia student should have the opportunity to portray the lead anesthesia provider role to experience the full potential of high-fidelity simulation as an EI educational tool.
- ❖ EI remains a new concept in healthcare professional education, especially in highly stressful professions such as anesthesia.
- ❖ The benefits of addressing the emotional and mental well-being of healthcare professionals working in highly stressful environments can produce multilayered benefits for patients and providers.

## LITERATURE REVIEW

Multiple themes emerged from the literature review revealing the positive impact of EI on the following:

### Emotional Intelligence & CRNAs

- Boyd and Poghosyan (2017) identified four themes affecting the organizational climate CRNAs face daily: communication and collaboration, professional identity and autonomy, relational issues, and outcomes.
- Stress and burnout among CRNAs are associated with lower levels of EI that compromise patient outcomes and safety (Codier et al., 2008), (Adams & Iseler, 2014), as cited in Bittinger et al., 2020).
- Cooper (2018) emphasized the potential benefits of EI training programs in improving the relationships among providers, which ultimately contribute to positive outcomes and a healthier work environment.

### Emotional Intelligence & SRNAs

- According to Mesica and Malmwaring (2021), considering the multiple challenges SRNAs face, developing interventions that positively manage those challenges is necessary.
- SRNAs' higher levels of EI can enhance their skill set and opportunities for success as students and future CRNAs (Collins, 2013).
- Collins and Andrejco (2015) asserted that the ability to cope effectively with significant stress levels during training impacts SRNAs' academic and clinical outcomes and success as they transition to CRNAs.

### Emotional Intelligence Training

- Collins and Andrejco (2015) suggest that passive EI growth in NA programs is insufficient to prepare SRNAs for future success. SRNAs would benefit from active EI training in stress and emotion management.
- Collins (2013) suggested including EI in NA education may positively influence NCE scores and predict successful program completion.
- Christanson (2020) supported EI and critical thinking development in nursing programs, which positively influence emotional well-being and patient outcomes (Bulmer et al., 2009), (Fernandez et al., 2012), as cited in Christanson, 2020).

### Emotional Intelligence Simulation

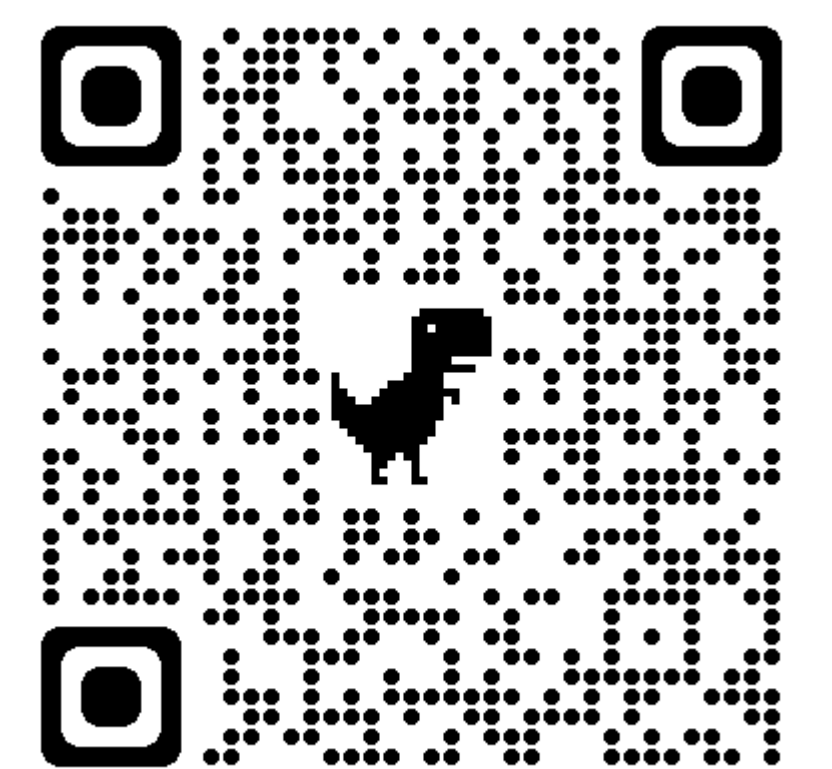
- According to the Council on Accreditation of Nurse Anesthesia Education Programs' (COA's) graduate standards, the goal of simulation in NA programs is to provide SRNAs with opportunities to practice safe, quality patient care by applying didactic knowledge to clinical scenarios (COA, 2022).
- EI-based post-simulation debriefing sessions provide subjective learning encounters that increase self-knowledge and perspective while allowing individuals to reflect on experiences to evaluate and identify areas for improvement regarding EI in emotionally charged situations (McKinley & Phitayakorn, 2015).
- Morber and Beauvais (2017) developed and implemented a high-fidelity simulation to enhance SRNAs' ability to perceive emotions. This was followed by a discussion-based evaluation of each participant's ability-based EI model in both the scenario and debriefing process.

## EVALUATION

Post-Simulation Survey	MSCEIT Scores	Post-Clinical Follow-Up Survey
83 to 92% of participants agreed or strongly agreed that the simulation enhanced their perceived abilities to identify, use, understand, and manage emotions.	Comparison pre-admission and post-intervention MSCEIT results were compared: four branch scores, two area scores, eight task scores, and total scores.	74 to 79% of participants agreed or strongly agreed that the simulation enhanced their perceived abilities to identify their own emotions and those of staff and use them constructively and appropriately during their first clinical rotation.
92% of participants agreed or strongly agreed that the simulation enhanced their EI skills in preparation for the challenges they could encounter during their first clinical rotation.	The average total of MSCEIT scores decreased marginally from 102.4 to 102.0.	70% of participants agreed or strongly agreed the simulation enhanced their perceived abilities to understand the reasons behind their emotions and behaviors in addition to the emotions and behaviors of the staff at their clinical sites.
	No results showed to be statistically significant within a 95% confidence interval.	61% of survey participants agreed that they felt more prepared to face the challenges they encountered during clinical after participating in the simulation.

## LIMITATIONS & REFERENCES

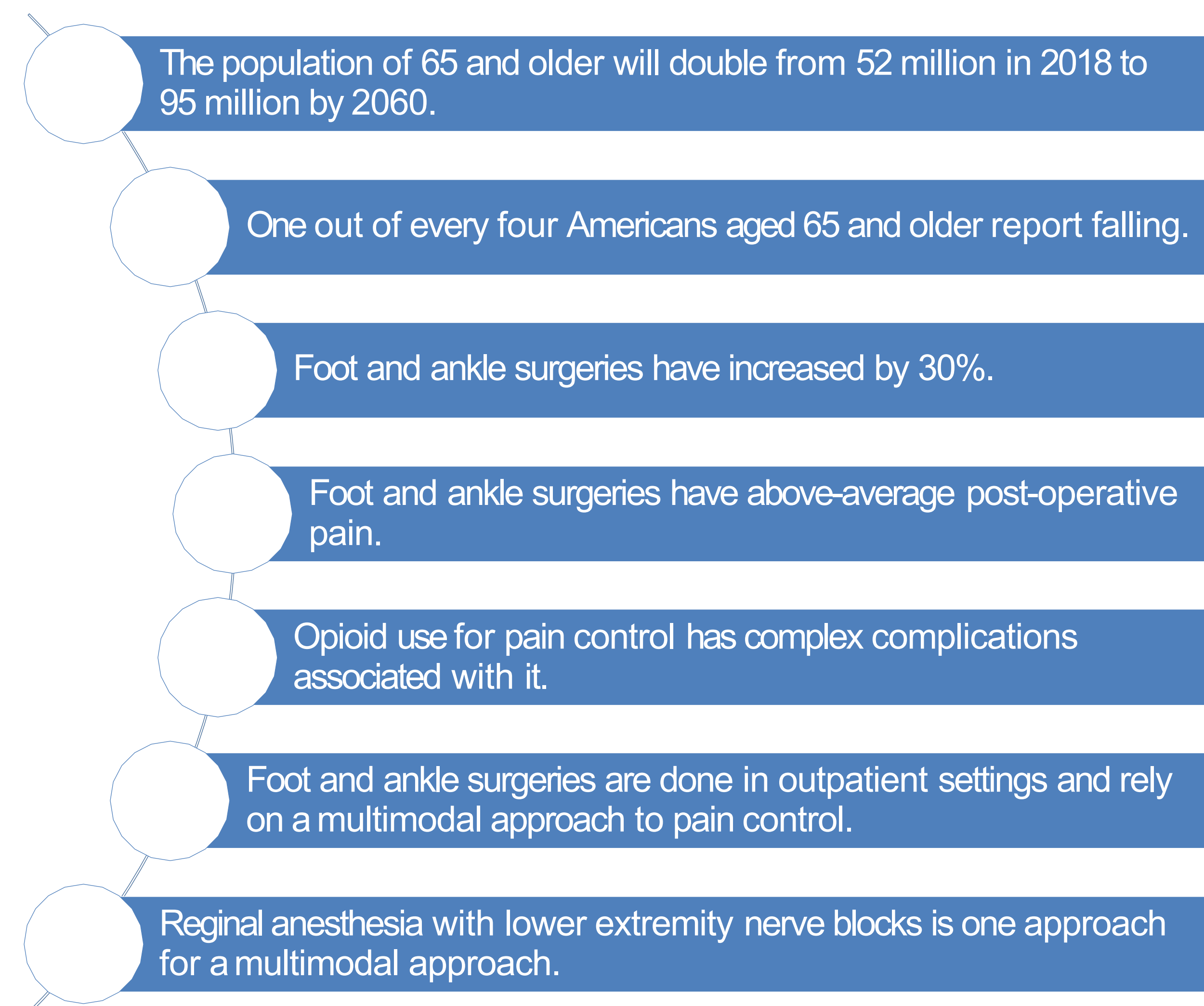
- ❖ Small sample size
- ❖ Inconsistent demographic data collection
- ❖ Timing and scheduling constraints
- ❖ Short time frame between training modules and simulation
- ❖ Lack of formal data collection during the simulation
- ❖ Only eight of 32 students could portray the SRNA role in the simulation
- ❖ Possibility of bias associated with self-perceived EI measurements
- ❖ Post-intervention MSCEIT completed outside of a controlled setting



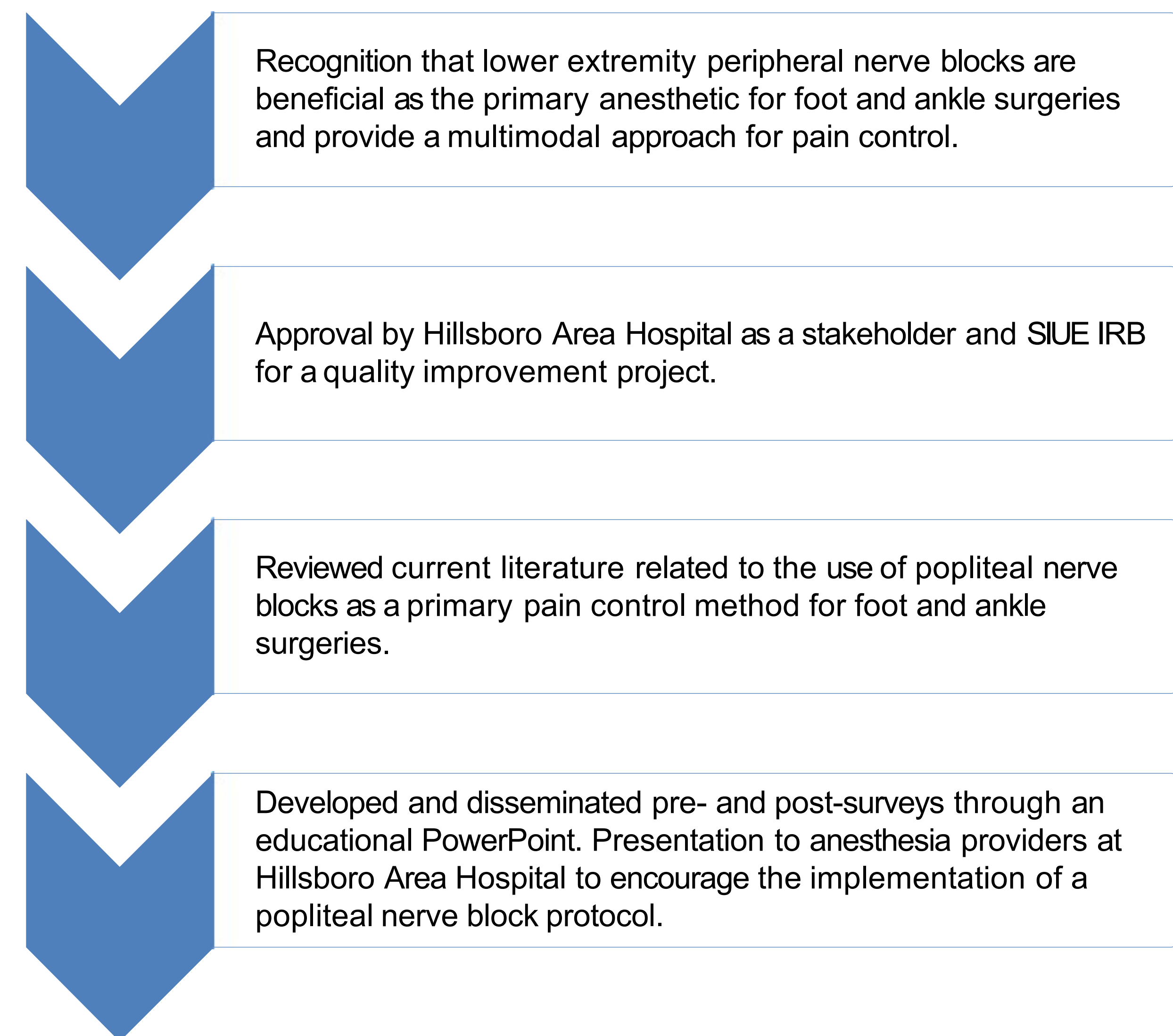
# Promoting the Incorporation of Regional Anesthesia to Improve Pain Management for Lower Extremity Surgeries

Kendra Knaga, BSN, SRNA  
Southern Illinois University Edwardsville

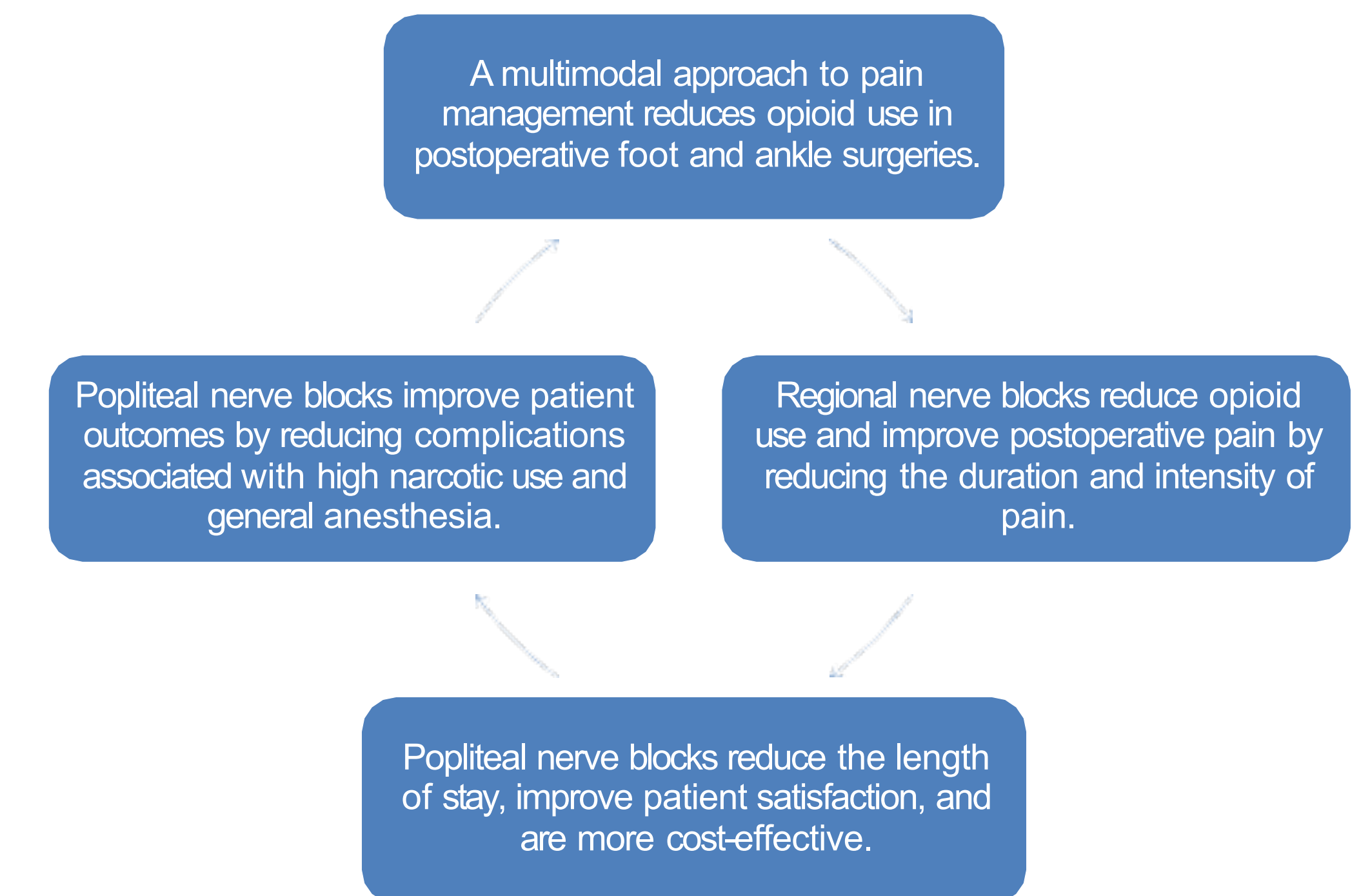
## PROBLEM INTRODUCTION



## PROJECT METHODS



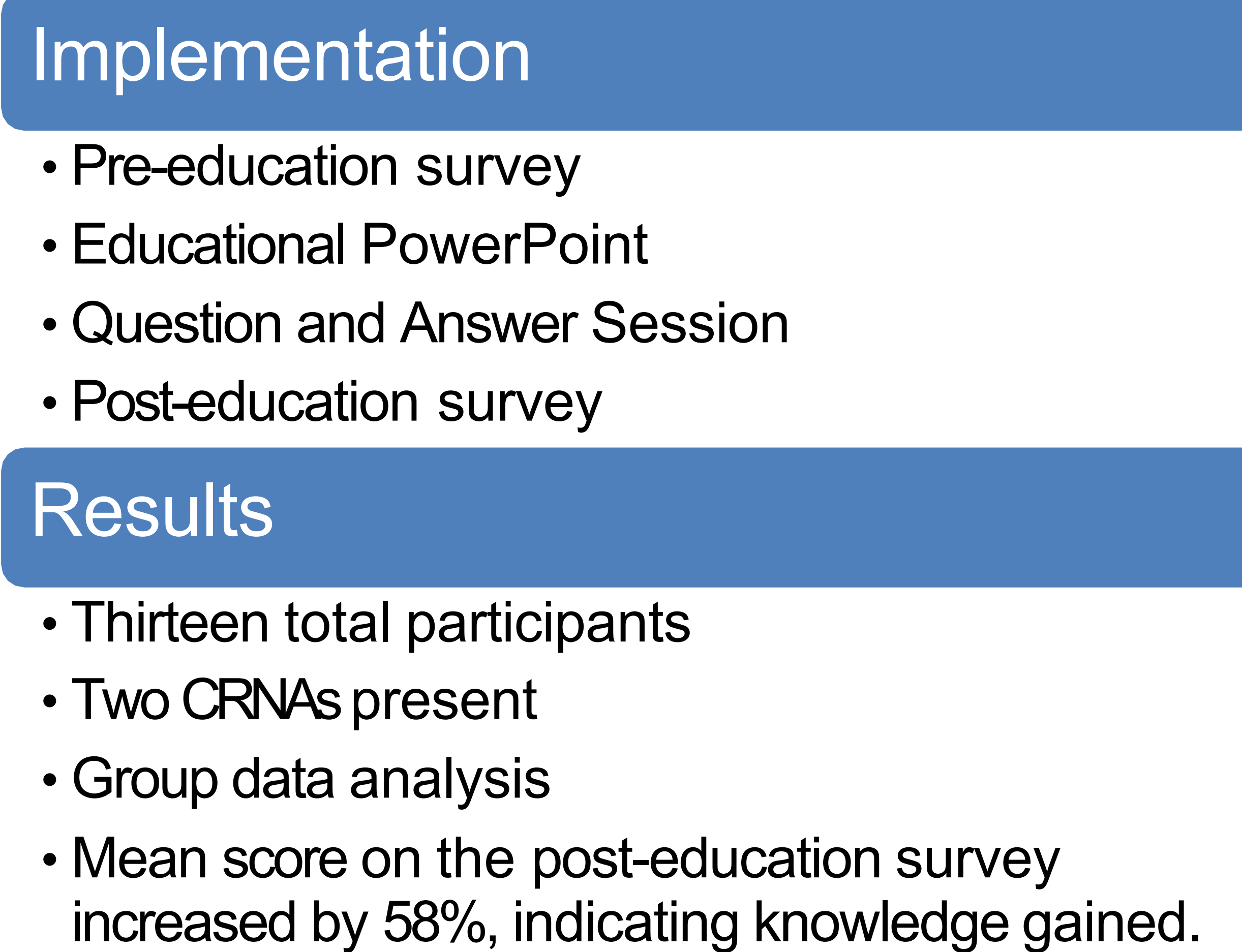
## IMPACT ON PRACTICE



## LITERATURE REVIEW



## EVALUATION



## CONCLUSIONS

- The increase in the aging population directly correlates to increased falls healthcare providers treat.
- Foot and ankle injuries from falls require surgical intervention from orthopedists or podiatrists.
- Foot and Ankle surgeries are considered especially painful.
- A multimodal approach for pain control when performing foot and ankle surgeries has better outcomes and increased patient satisfaction.
- Education for perioperative staff on the importance of popliteal blocks for foot and ankle surgeries can greatly improve healthcare delivery of this patient population.

## Limitations

- Attendance of educational in-service due to lack of perioperative staff availability.
- Implementation was given when many anesthesia providers and physicians were out of town.

## References



# Effectiveness of Virtual Reality in Anesthesia Machine Education

Rachel Geisendorfer, BSN, SRNA and Heather Milder, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

- The anesthesia machine is an essential part of anesthesia practice; Certified Registered Nurse Anesthetists (CRNA) should be properly trained to utilize and troubleshoot the anesthesia machine to provide high quality patient care.
- The Southern Illinois University Edwardsville (SIUE) Doctor of Nurse Anesthesia Program (DNAP) has an immersive virtual reality (VR) simulation software known as SIMVANA, which allows SRNAs to safely interact with an anesthesia machine to develop knowledge and skills necessary to perform an anesthesia machine checkout and familiarize students with machine functions. Currently, SIMVANA is not part of the DNAP course curriculum. There is a lack of research involving the use of virtual reality simulation for anesthesia machine education.
- This project assessed the effectiveness of utilizing SIMVANA for first-year SRNAs to learn about the anesthesia machine functions and alarms.

## LITERATURE REVIEW

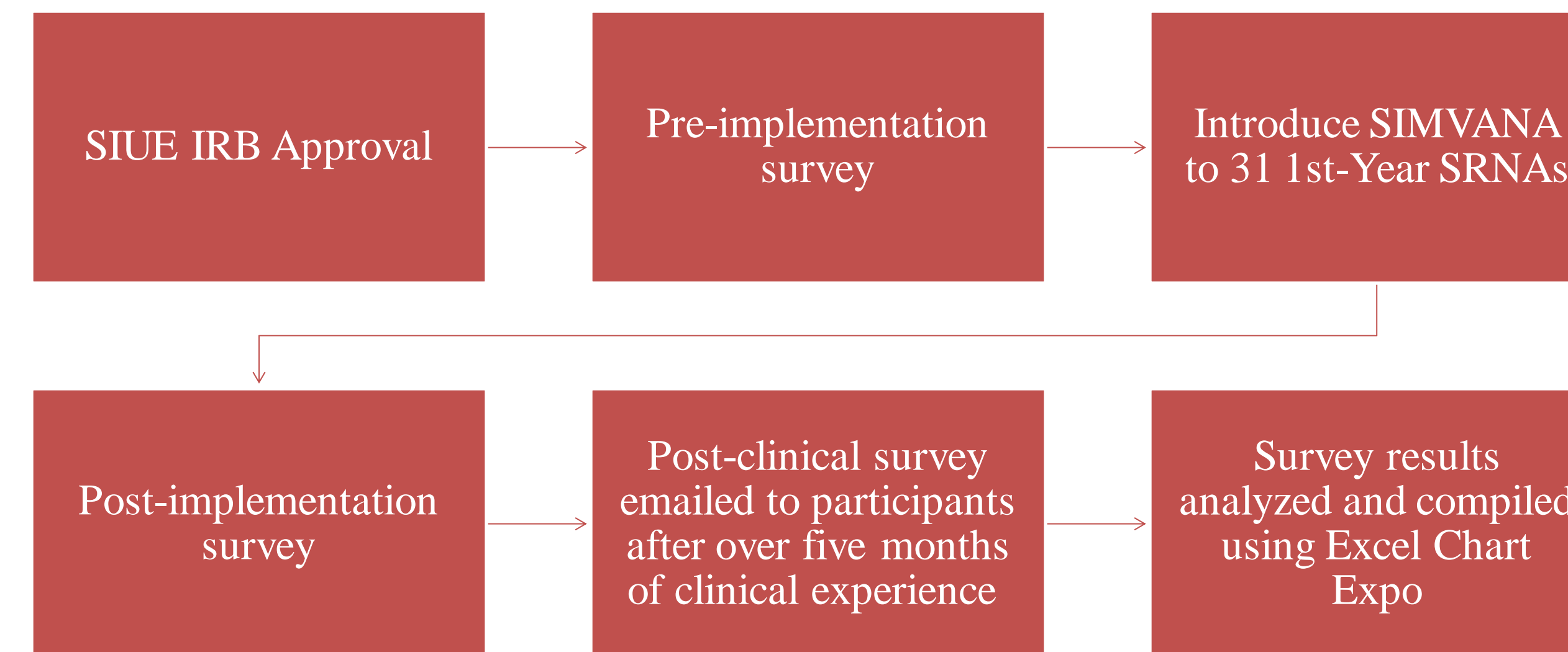
### Anesthesia Machine

- Anesthesia machines have advanced in complexity since the early 20th century. In 1993, the FDA established anesthesia apparatus checkout recommendations. In 2008, the ASA updated the U.S. FDA recommendations to apply to all anesthesia apparatuses, with the purpose that anesthesia machine checkout protocols are now adapted to suit all types of machine designs and healthcare facilities (Brockwell et al., 2008).
- Anesthesia providers are responsible for thoroughly checking the anesthesia machine before the first case of the day, and additional checks must be completed before each anesthetic (Goneppanavar & Prabhu, 2013).
- There was a paucity of current literature addressing the issue of anesthesia machine checks and malfunctions.

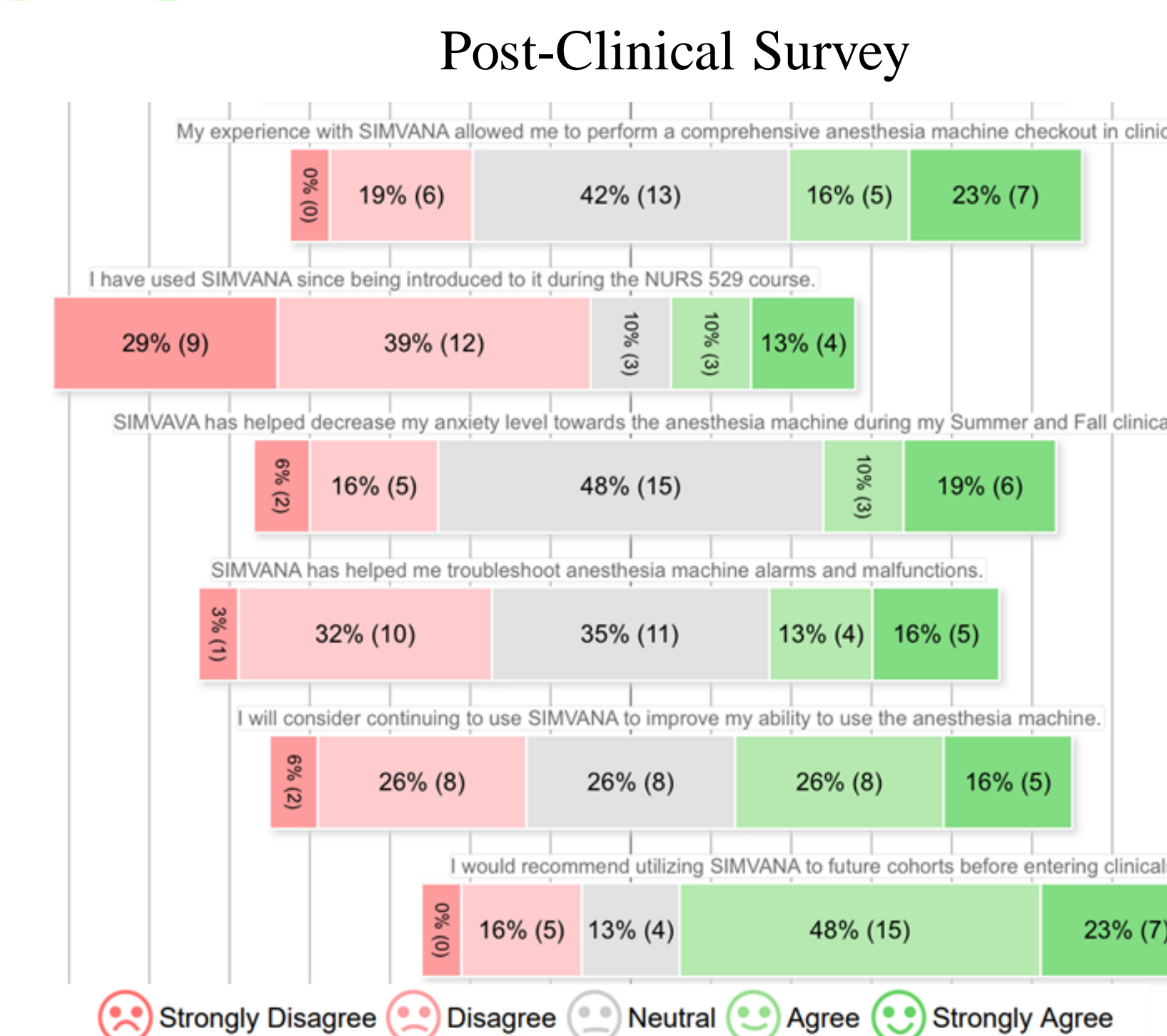
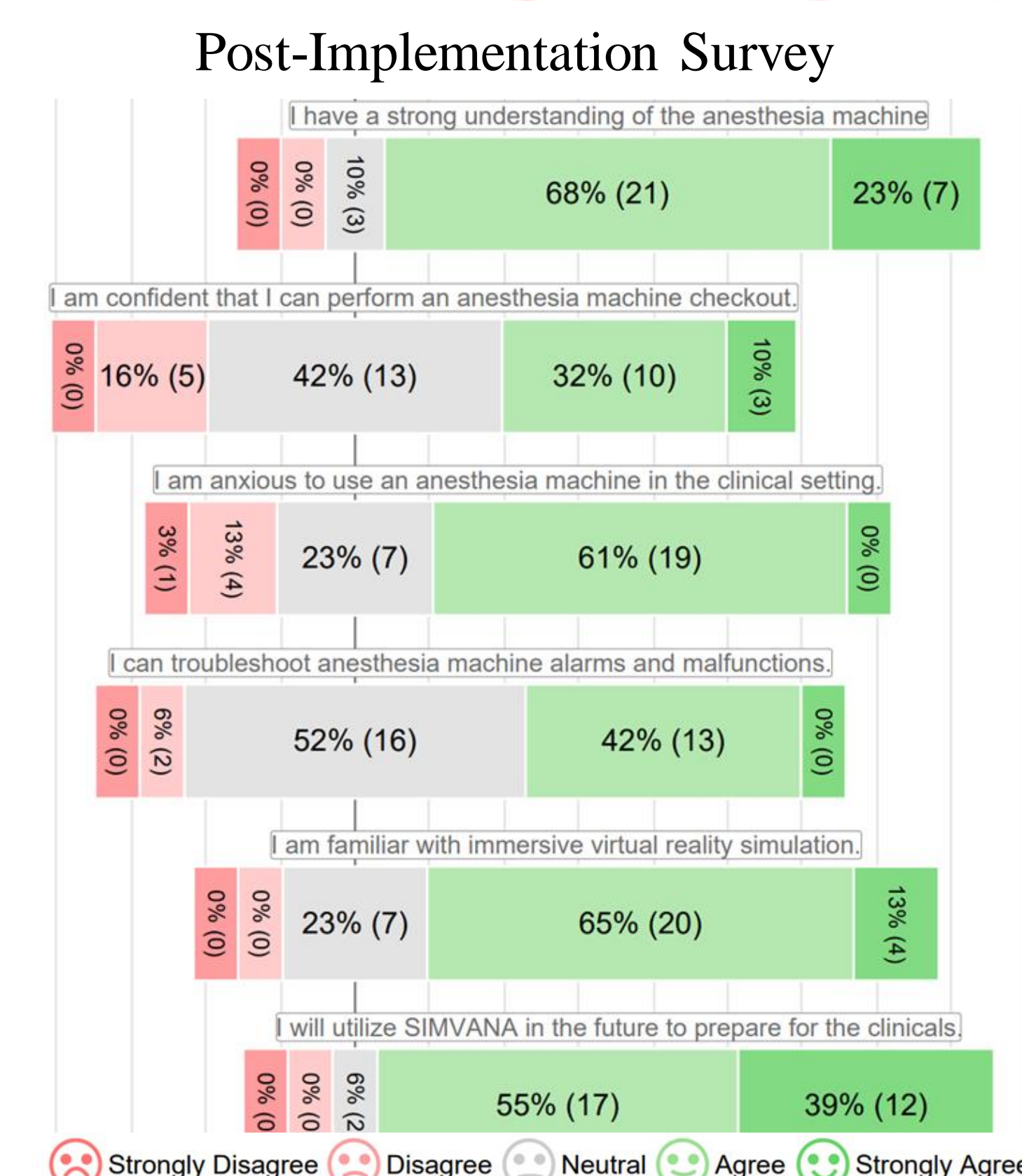
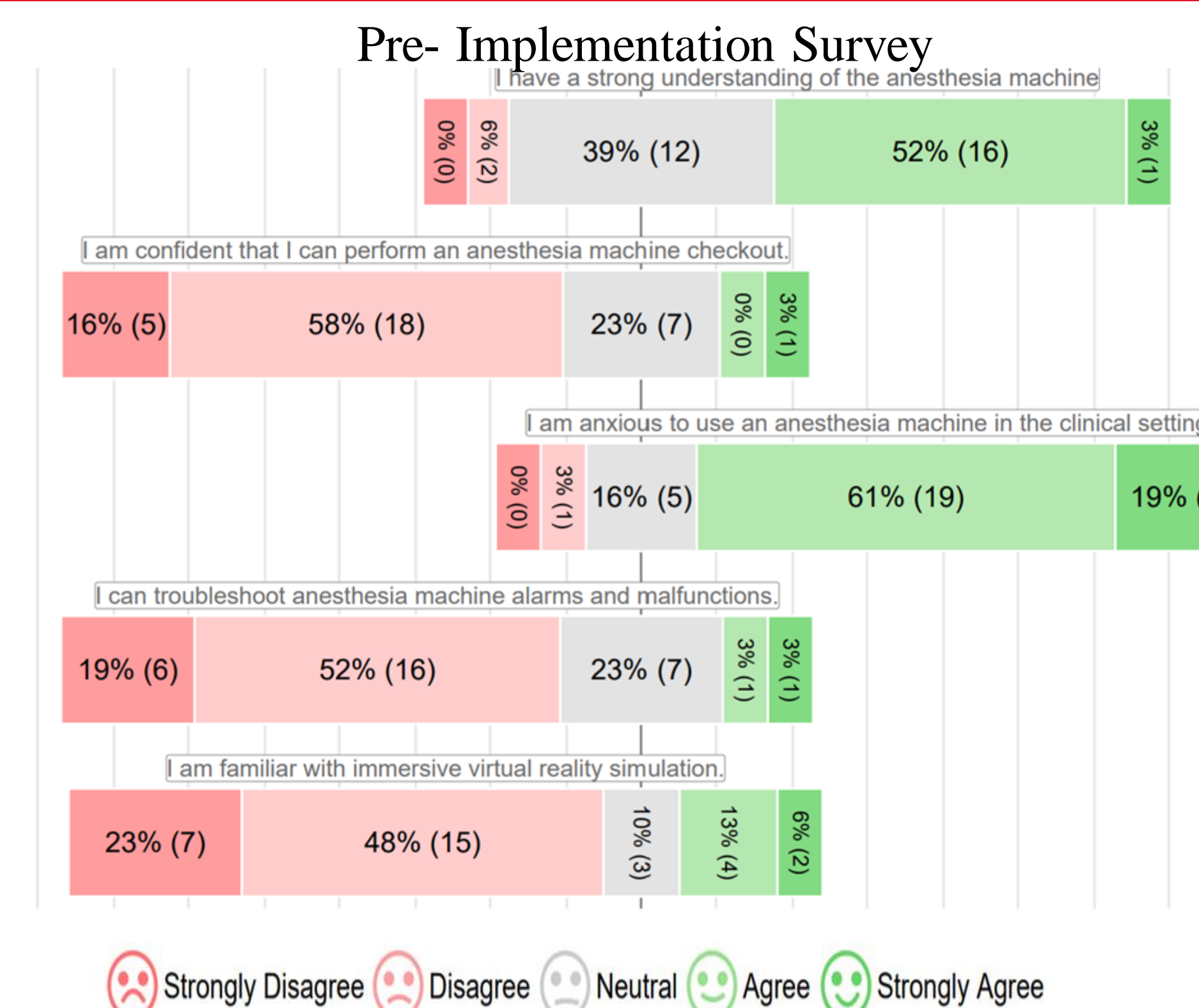
### Virtual Reality

- Experience and knowledge retention are improved through VR learning opportunities (Philippe et al., 2020).
- The use of VR in medical education produces equivalent or better outcomes than non-immersive training (Mooney et al., 2022).
- Immersive VR simulation has been successfully used to train regional anesthesia and rare anesthetic occurrences, such as an airway fire or a myocardial infarction (Lovquist et al., 2012; Zafar et al., 2021; Grottke et al., 2009).
- VR advantages - limit geographic barriers, reduce time commitment, limit participant experience inconsistencies, and reduce resource use (Orser & Spadafora, 2022; Merrick et al., 2020; Singh et al., 2012).

## PROJECT METHODS



## EVALUATION



## IMPACT ON PRACTICE

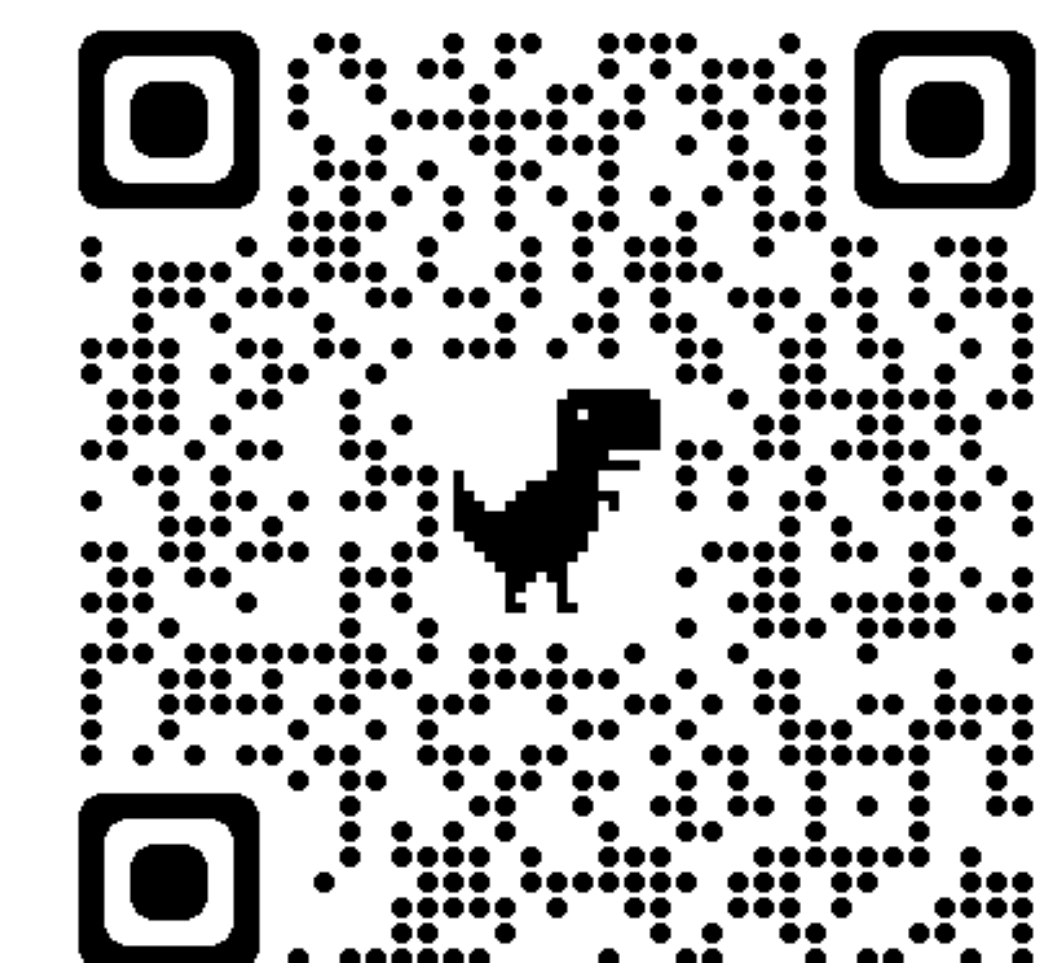
- Patient safety is the most important consideration in anesthesia practice.
- Proficiency at performing a machine checkout and a strong knowledge of the components of the anesthesia machine will impact anesthesia practice by improving patient safety.
- Thorough training on anesthesia machine functions allows for proper and timely responding to critical alarms, identifying malfunctions, and preventing adverse patient outcomes.
- By providing an additional means of learning, that varies from traditional methods of textbook reading and class lecture, a wider range of students can be provided with more opportunities to learn.



## CONCLUSIONS

- First year SRNAs had a reduction in anxiety surrounding use of the anesthesia machine after implementation.
- SRNAs liked that SIMVANA provided a realistic environment, was a low anxiety activity, and was a new form of education technology
- Overall, this study demonstrated a recommendation for using SIMVANA in future SIUE SRNA cohorts. Since anesthesia machines are a major component in providing anesthesia, improving the ability to understand machine functions and how to address alarms can improve patient safety and decrease provider anxiety. Improved education through simulation and exposure to anesthesia machine functions will create safer anesthesia providers.

## REFERENCES



# Evaluation and Education of Enhanced Recovery After Surgery (ERAS) Protocols for Total Knee Arthroplasty

Lauren Hunt, BSN, SRNA and Jessica Prost, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

- Crawford Memorial Hospital performs numerous total knee arthroplasties (TKA) yearly. This hospital utilizes innovative surgical and non-surgical techniques to provide patients with a well-rounded, best-practice experience. However, there is no ERAS protocol for patients receiving total knee arthroplasties.
- This project assessed the provider's knowledge of the current literature regarding ERAS protocols, willingness to implement a protocol in the future, and provided education through a PowerPoint presentation.

## LITERATURE REVIEW

### Preoperative Optimization

- Joint class reduces hospital costs by 27% (Gadsden, 2017).
- Smokers who quit for four weeks before surgery have an infection rate similar to non-smokers (Muñoz et al., 2014).
- It is recommended that patients undergoing major orthopedic surgery have their hemoglobin and iron levels tested at least 30 days before the surgery (Gadsden, 2017).
- Preoperative carbohydrate drinks significantly improve hunger, thirst, malaise, anxiety, and nausea postoperatively (Bilku et al., 2014).

### Gabapentinoids and Acetaminophen

- Encourages minimal opioid use by 49% (Gadsden, 2017).
- Found to improve joint range of motion and decrease rates of PONV, pruritus, anxiety, and incidence of chronic pain at 4-6 months postoperatively (Gadsden, 2017).
- Decreases PONV and reduces pain and postoperative opioid use by 33% (Gadsden, 2017).

### NSAIDs and COX-2 Inhibitors

- Produces analgesia and anti-inflammatory effects in the central and peripheral nervous systems (Gadsden, 2017).
- Provides the desired anti-inflammatory, antipyretic, and analgesic effects without the unfavorable side effects of non-selective NSAIDs. Celecoxib is most commonly seen in ERAS protocols (Gadsden, 2017).

### Spinal

- When compared to general anesthesia, spinal anesthesia is associated with a reduced length of hospital stay, a reduction in pulmonary distress, renal failure, and blood transfusions, and a reduction in 30-day mortality (Gadsden, 2017).

### Corticosteroids and Ketamine

- Due to the anti-inflammatory effects of dexamethasone, higher doses (>0.2 mg/kg) can produce analgesia and reduce opioid consumption (Gadsden, 2017).
- Works well in treating acute pain and preventing the development of chronic pain (Gadsden, 2017).
- Has been shown to reduce postoperative use of morphine by 25-40% (Gadsden, 2017).

### Postoperative Pain Control

- When looking at the efficacy of the adductor canal, IPACK, and genicular nerve blocks, not one has been identified as superior; they all provide pain relief postoperatively, reduce opioid consumption, and positively impact cognitive function and sleep (Oseka & Pecka, 2018).

## PROJECT METHODS



A PowerPoint was created utilizing the current literature regarding ERAS protocols for TKAs

IRB approval was obtained from SIUE

Non-experimental pre-survey, post-survey design using 17 providers

The pre-survey was given to the staff via a QR code, followed by the educational PowerPoint presentation, and ending with the post-survey via QR code

Survey results were compared to evaluate knowledge gained and the likelihood of implementing a TKA ERAS protocol into practice

## EVALUATION

- Knowledge gained by the staff was assessed by comparing the scores of the pre-survey to the scores of the post-survey.
- Four of the nine questions showed significant improvement in correctness from pre- to post-survey.
- Three questions were answered 100% correctly in both surveys.
- The significant increase in the correctness of the questions from the pre-survey to the post-survey implied an increase in staff knowledge regarding ERAS protocols for TKAs following the PowerPoint presentation.
- The final question asked in the post-survey was a Likert scale question.
- 100 percent of participants either agreed or strongly agreed they would support the implementation of an ERAS protocol for TKAs in their facility after participation in this project.

## IMPACT ON PRACTICE

The number of joint procedures in the United States is exponentially increasing. Approximately one million total joint procedures occur yearly, with numbers expected to increase to 4 million by 2030 (Etkin & Springer, 2017).

The project immediately impacted the staff's education and increased their desire to adopt and utilize an ERAS protocol.

### ERAS for TKAs

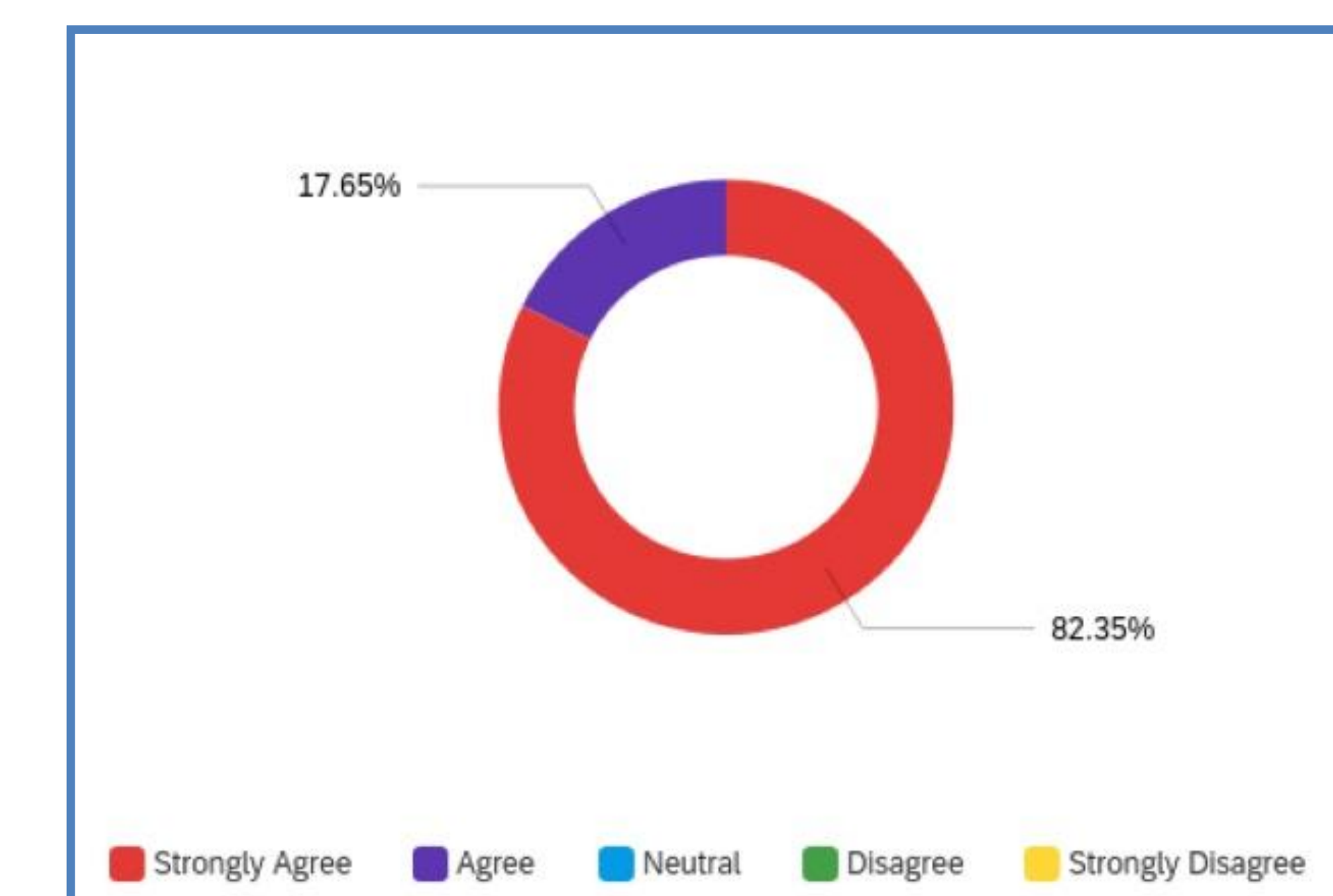
ERAS protocols in the orthopedic discipline have been shown to decrease postoperative pain, hospital length of stay, and cost (Frassanito et al., 2020).

Crawford Memorial Hospital is one step closer to creating and utilizing its own ERAS protocol for patients receiving total knee arthroplasties.

## CONCLUSIONS

As the population continues to age, the need for total knee arthroplasties is expected to quadruple by 2030. ERAS protocols are an essential part of the perioperative experience for these patients to flourish. Crawford Memorial Hospital performs numerous TKAs every year, and an ERAS protocol will benefit these patients. Educating the staff at Crawford Memorial Hospital about ERAS protocols was an essential beginning step to implementing an ERAS protocol.

**Q14 – I am likely to support the implementation of a total knee arthroplasty ERAS protocol as a result of this presentation.**



# Promoting Quantitative Monitoring to Reduce Postoperative Residual Neuromuscular Blockade: An Educational Intervention for Anesthesia Providers

Caleb Culbreath, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

A high incidence (64%) of postoperative residual neuromuscular blockade persists despite advanced monitoring and reversal agents (Thilen et al., 2023).

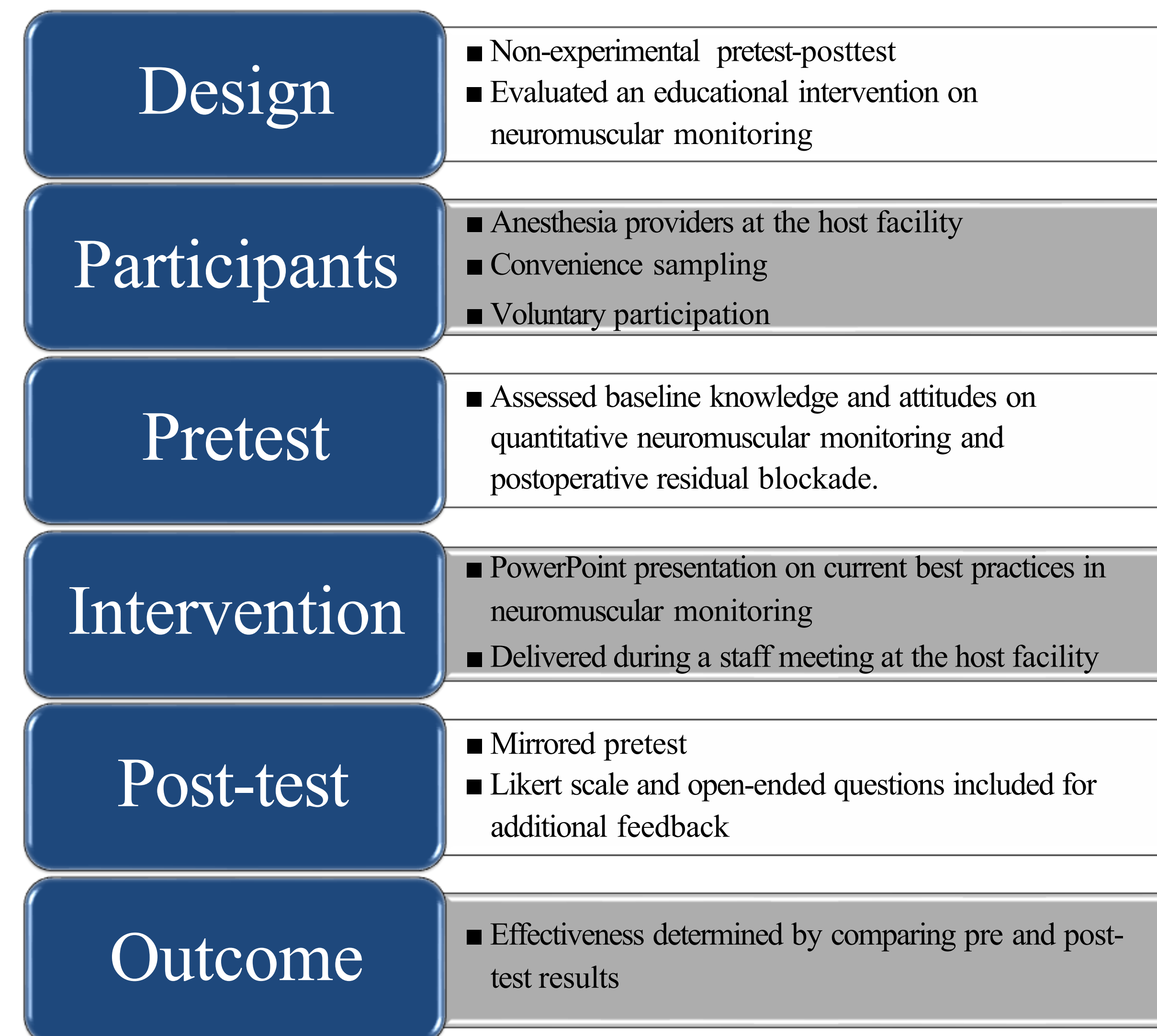
Objective evaluation methods are superior to subjective assessments in detecting and preventing residual neuromuscular blockade (Carvalho et al., 2020).

Project focus: Enhancing anesthesia providers' knowledge and practices regarding quantitative neuromuscular monitoring and residual blockade.

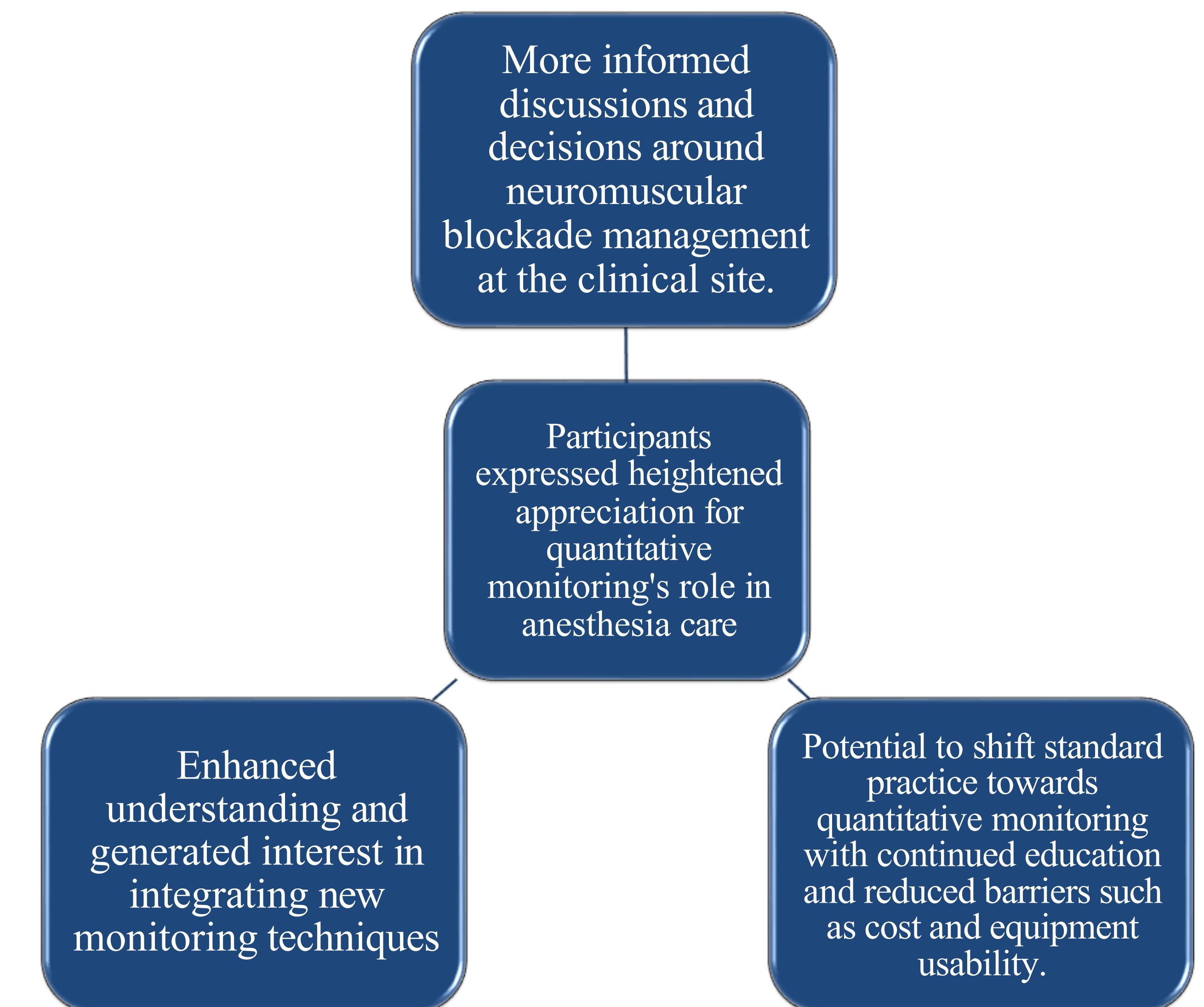
Residual blockade leads to preventable postoperative complications, increasing hospital costs and patient morbidity (Saager et al., 2019).

Guidelines advocate for using quantitative monitoring to guide neuromuscular blockade management (Naguib et al., 2018; Thilen et al., 2023).

## PROJECT METHODS



## IMPACT ON PRACTICE



## LITERATURE REVIEW

### Search Strategy

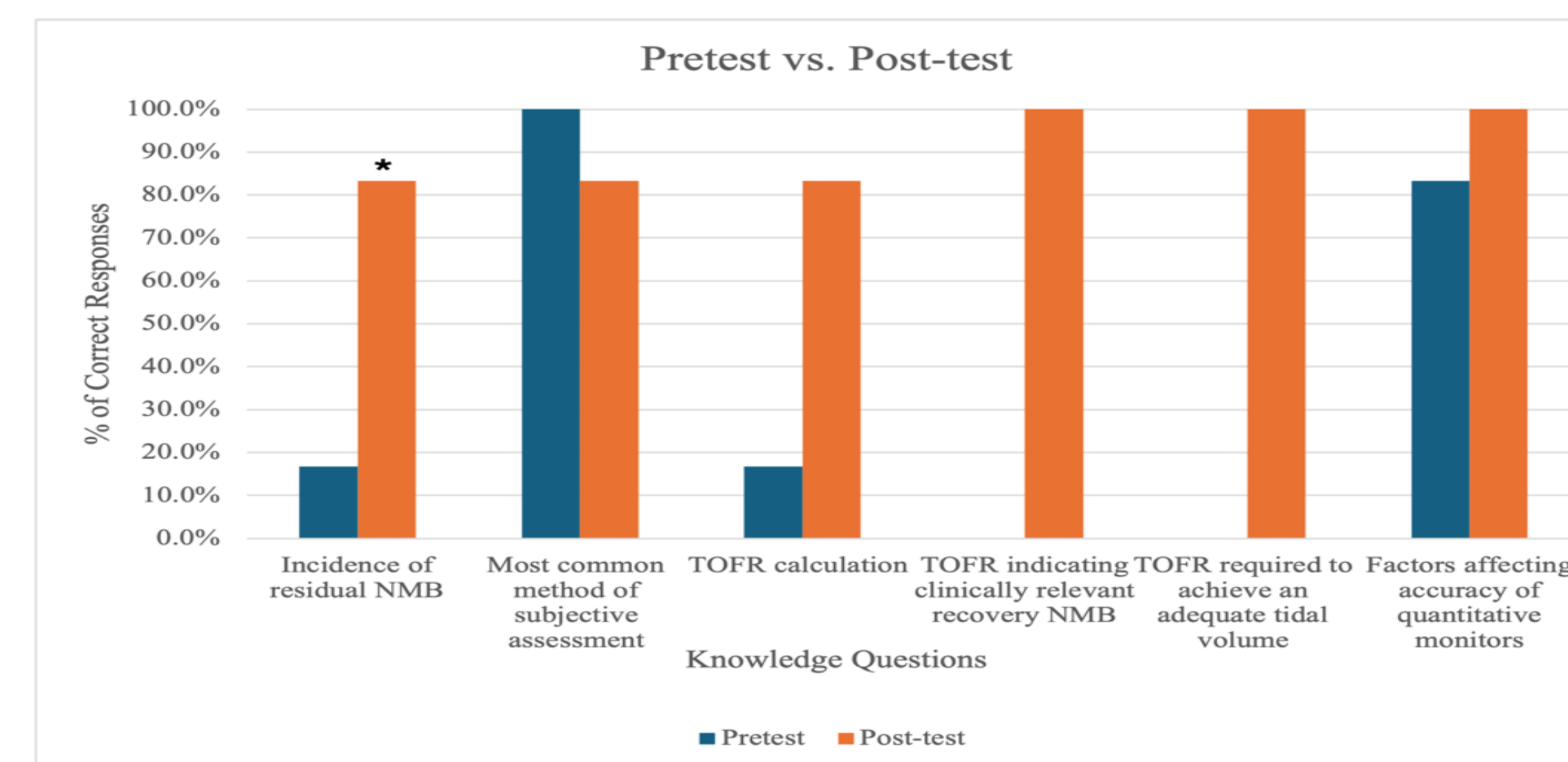
- Databases:** CINAHL, PubMed, MEDLINE Complete, Google Scholar
- Inclusion Criteria:** 25 articles selected
  - Relevance to neuromuscular monitoring and NMB management
  - Published within the last 10 years

### Key Findings

- Clinical signs and subjective TOF assessments lack sensitivity for detecting residual paralysis and readiness for extubation (Thilen et al., 2023).
- Objective monitors utilize electromyography (EMG), acceleromyography (AMG), or kinemyography (KMG) to quantify the TOFR (Murphy & Brull, 2022).
- Quantitative monitoring significantly reduces the incidence of postoperative residual NMB when compared to qualitative methods (Carvalho et al., 2020).
- Reduced risk of hypoxemic events, upper airway obstruction, and reintubation when NMB is measured objectively (Adembesa et al., 2018; Weigel et al., 2022).
- ASA guidelines recommend the use of quantitative monitoring to ensure a TOFR  $\geq$  0.9 before extubation (Thilen et al., 2023).

## EVALUATION

- 8 participants
- Paired Wilcoxon signed-rank tests revealed a significant increase in correct responses post-intervention on 4 out of 6 knowledge questions.
- Post-test responses showed a notable shift towards strong agreement on the essential role and adoption of quantitative neuromuscular monitoring after the intervention.
- Participants unanimously praised the clarity, knowledge delivery, and overall quality of the educational presentation, rating it as "Excellent."
- Feedback highlighted initial costs, provider buy-in, and equipment usability as key barriers to the implementation of quantitative monitoring.
- Limitations: Small sample size limits the generalizability of findings



## CONCLUSIONS

- The project underscored the value of targeted educational interventions in improving understanding and potentially shifting clinical practices in anesthesia.
- The knowledge gains in neuromuscular blockade monitoring signify that broader implementation of such educational strategies could significantly impact anesthesia safety and patient outcomes.
- Future efforts should integrate these educational components into ongoing clinical training, tackle identified economic and technical challenges, and encourage a collective approach to practice change to reinforce the project's benefits.



## References



# ERAS Protocol for Bariatric Surgery

Krista Bunch, BSN, SRNA

Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

- The prevalence of obesity is on the rise in the U.S., with about 30 million adults meeting eligibility for bariatric surgery (Campos et al., 2020)
- There has been a marked increase in the demand for bariatric surgery & increased interest in shifting some procedures to an ambulatory care setting (Stenberg et al., 2022)
- However, postoperative complications can cause patients to experience an increased length of stay in the hospital & suboptimal outcomes (King et al., 2018)

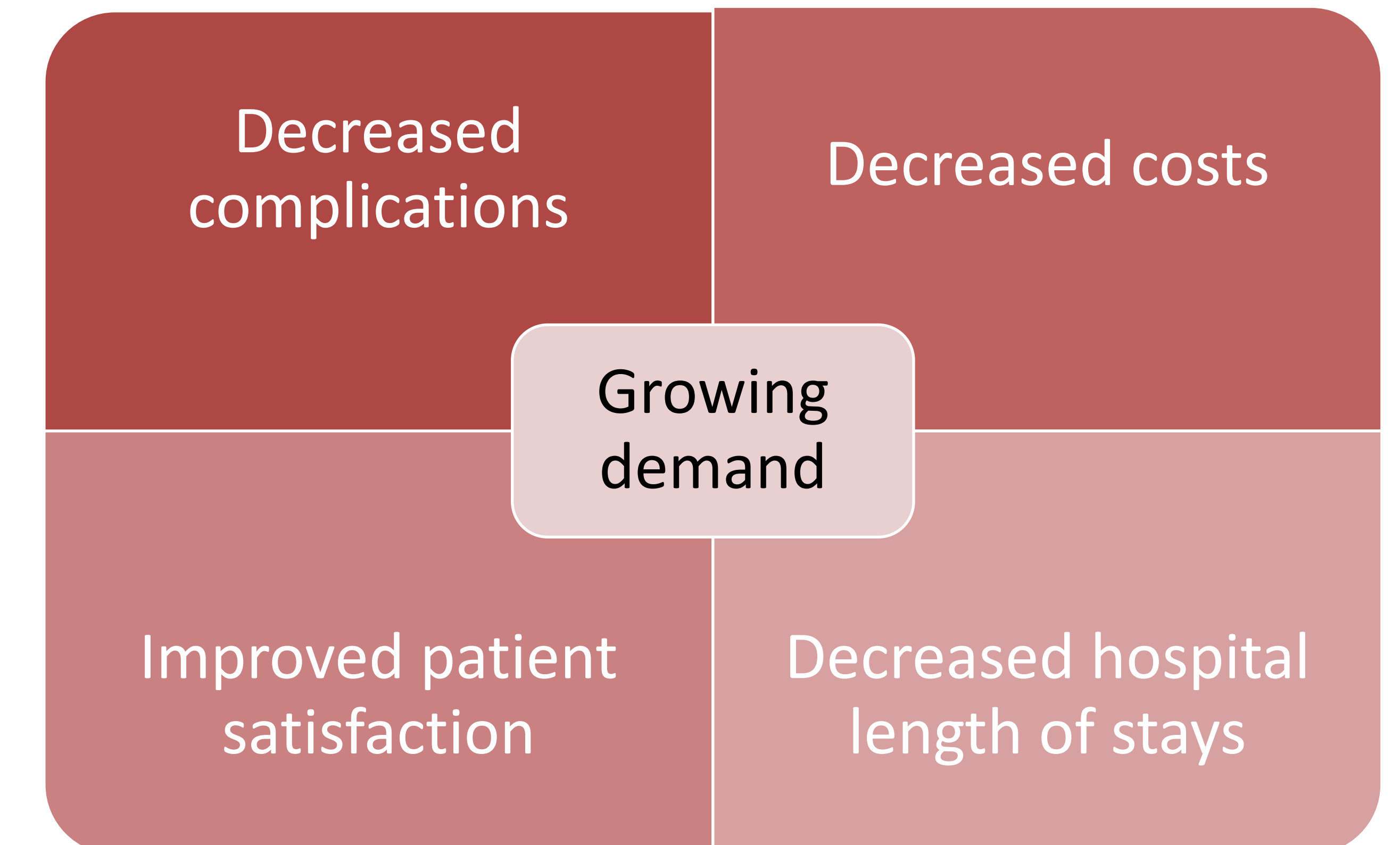
### Postoperative Complications

Postoperative nausea/vomiting (PONV)	Pain	Bleeding	Deep vein thrombosis (DVT)
Infection	Bowel Obstruction	Malnutrition	Cardiopulmonary complications

## PROJECT METHODS

- Project aim: to introduce components of an evidence-based ERAS protocol for bariatric surgical patients to healthcare providers
- Focus areas included components for best practices in each of the four stages of the perioperative process
- Project design: non-experimental quality improvement project
- Primary stakeholders: bariatric surgeons, certified registered nurse anesthetists (CRNAs), & registered nurses (RNs) at the host facility
- Bariatric surgical patients and their families were also stakeholders, as their outcomes can be improved by implementing such a protocol.

## IMPACT ON PRACTICE



## EVALUATION

- All participants believed that ERAS protocols could positively impact patient outcomes
- The presentation was unanimously deemed informative and helpful by all participants.
- Participants expressed the opinion that an ERAS protocol based on the evidence presented in the project could be successfully implemented at their respective facilities

Questions	Correct Answers	Sample N (%)	
		Correct	Incorrect
Have you received education on or used other ERAS protocols at your facility?	Yes or No	Yes) 6 (100%) (No) 0 (0%)	
What are the goals of an ERAS protocol?	All of the above (maintain physiologic function, enhance mobilization postoperatively, reduce pain postoperatively, facilitate early oral nutrition)	6 (100%)	0 (0%)
An ERAS protocol means there is a standardized routine anesthetic technique for all patients, regardless of patient-specific considerations. True or false?	False	5 (83%)	1 (17%)
Components of an ERAS protocol for bariatric surgery may include?	Both a & b (opioid-sparing analgesia & multimodal postoperative nausea and vomiting prophylaxis)	6 (100%)	0 (0%)
Do you believe ERAS protocols can be beneficial to patient outcomes?	Yes or No	Yes) 6 (100%) (No) 0 (0%)	
Did you find the PowerPoint presentation to be informative and useful?	Yes or No	Yes) 6 (100%) (No) 0 (0%)	
In your opinion, can an ERAS protocol created from the evidence-based research presented be implemented at your facility?	Yes or No	Yes) 6 (100%) (No) 0 (0%)	

## LIMITATIONS

Due to time constraints, staff availability, & the limitation of implementation if project via email:

- Small sample size
- Sampling bias
- Convenience sampling

## CONCLUSIONS

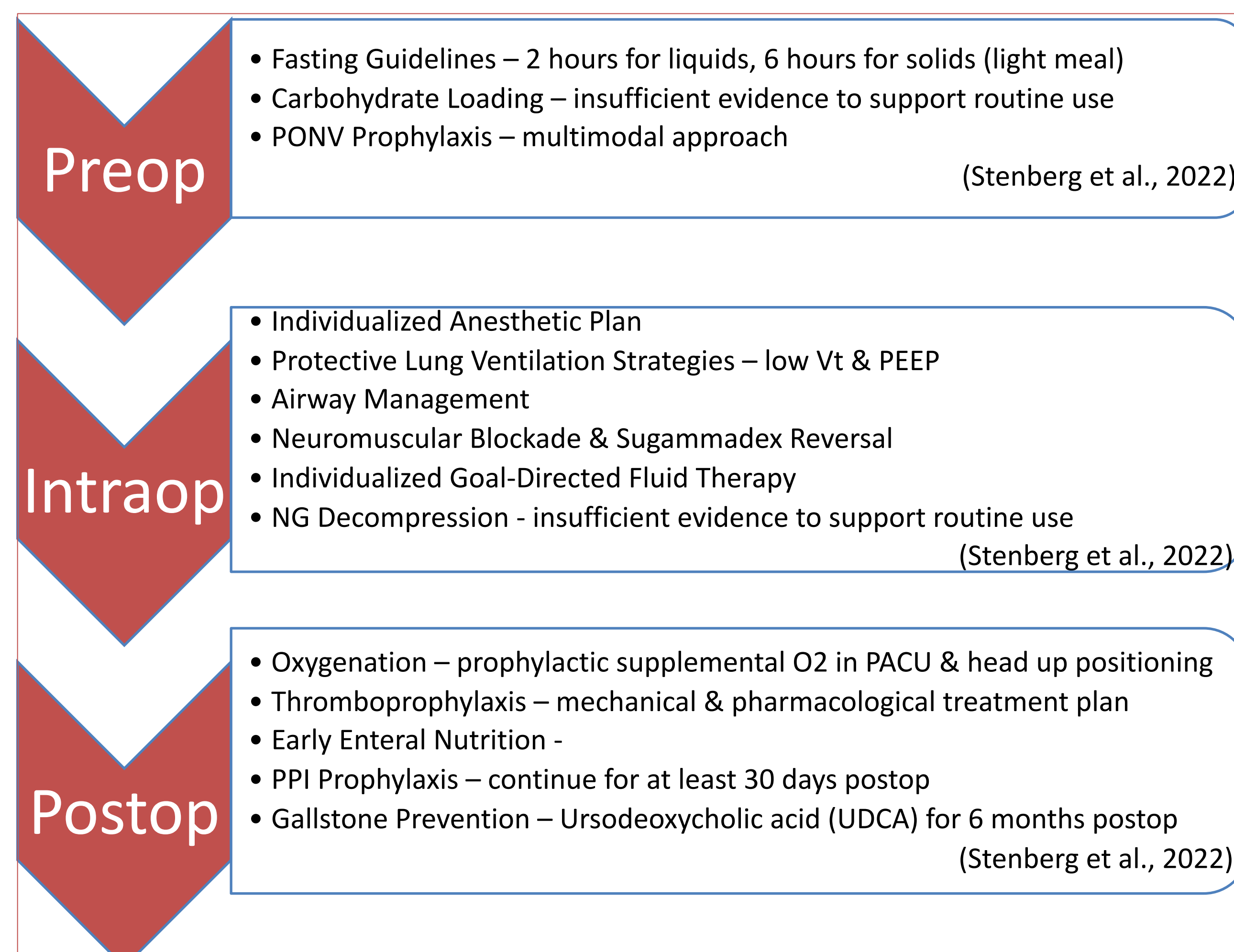
- Introduced key components of ERAS protocol to be utilized for bariatric surgery with the long-term potential of improving patient outcomes and satisfaction.
- Results of this of the post-presentation survey indicate an increased knowledge of ERAS protocol for bariatric surgery and a likely willingness to adopt protocol components.
- Despite low levels of project participation, the overall recognition of the positive effect of the ERAS protocol was indisputable.
- Full adoption & implementation of the proposed components for ERAS protocol for bariatric surgery would likely aid in decreasing complications, costs, and hospital lengths of stay for the host facility.

### Reference List



## LITERATURE REVIEW

### ERAS Focuses of Each Operative Stage



# Evaluating the Efficacy of Perioperative Methadone in Cardiac Surgery

Brock Thornton, SRNA  
Southern Illinois University Edwardsville

## INTRODUCTION

Cardiac surgery includes multiple highly invasive and extensive procedures and is associated with moderate to severe pain in up to 75% of patients.<sup>3,6,26</sup>

More than 33% of cardiac surgery patients experience chronic pain in the first six months after surgery, and 17% of patients experience chronic pain two years after surgery; this begins with uncontrolled acute postoperative pain.<sup>15-17</sup>

A central Illinois hospital expressed interest in determining the efficacy of perioperative methadone administration in cardiac surgery patients compared to traditional pharmacologic methods for controlling perioperative pain.

There is a desire to implement opioid-sparing strategies via Enhanced Recovery After Surgery (ERAS) protocols to improve patient recovery after cardiac surgery.<sup>14,15</sup>

The safety and efficacy of methadone has been evaluated in pediatric and adult cardiac surgery, as well as spinal, orthopedic, and bariatric surgery.<sup>15-17</sup>

## LITERATURE REVIEW

### Pharmacodynamics

- Mu, Kappa, & Delta opioid receptor agonist<sup>13,14</sup>
- N-methyl-D-aspartate (NMDA) receptor antagonist<sup>13,14,19</sup>
- Serotonin-norepinephrine reuptake inhibitor (SNRI)<sup>13,14,19</sup>

### Pharmacokinetics

- 80% PO and IV bioavailability<sup>7,13</sup>
- Slowly released into the plasma from adipose storage<sup>14,20</sup>
- Hepatic metabolism with long duration of action<sup>14-17</sup>
- Elimination half life 24-36 hours with doses nearing 20mg<sup>14-17</sup>

### Administration in Cardiac Surgery

- **0.1 to 0.3 mg/kg IV** prior to surgical incision improves postoperative analgesia and decreases postoperative opioid requirements compared to morphine, fentanyl, and/or hydromorphone.<sup>12,15-17,19,20,24</sup>
- Methadone administration improves patient satisfaction at 24, 48, and 72 hours postoperatively.<sup>15-17</sup>
- No difference in adverse outcomes between methadone and traditional analgesics<sup>3,15,16,24</sup>

## PROJECT METHODS



QUALITY IMPROVEMENT PROJECT



EDUCATIONAL PRESENTATION FOR ANESTHESIA TEAM MEMBERS AT THE DESIGNATED TERTIARY CARE FACILITY



PRE-TEST / POST-TEST DESIGN VIA QUALTRICS

## EVALUATION

5 CRNAs + 1 Anesthesiologist in attendance

4 CRNAs completed pre-test / post-test surveys

Pre-test average score: 45.8%

Post-test average score: 100%

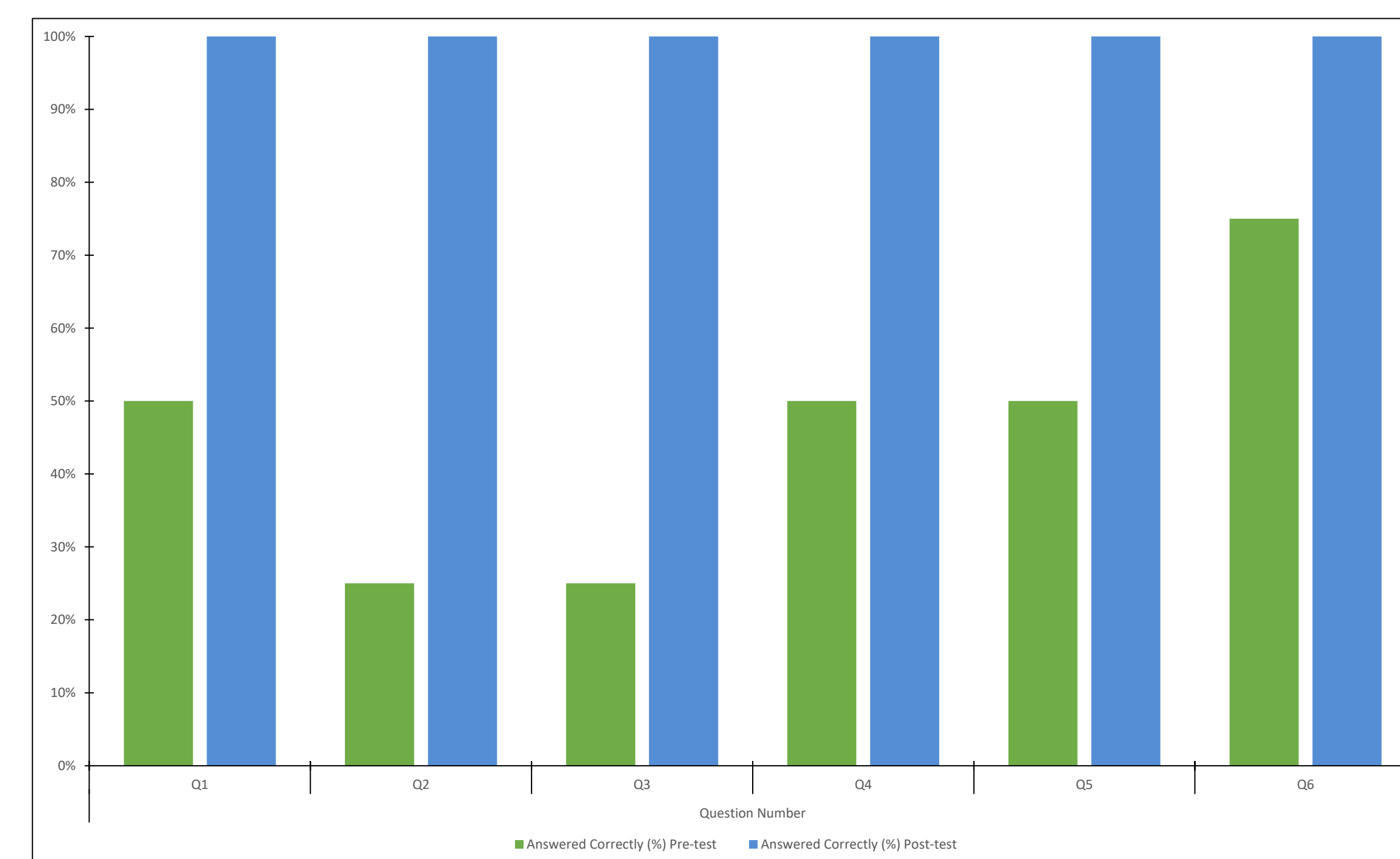


Figure 1. Pre-Test vs. Post-Test Scores.

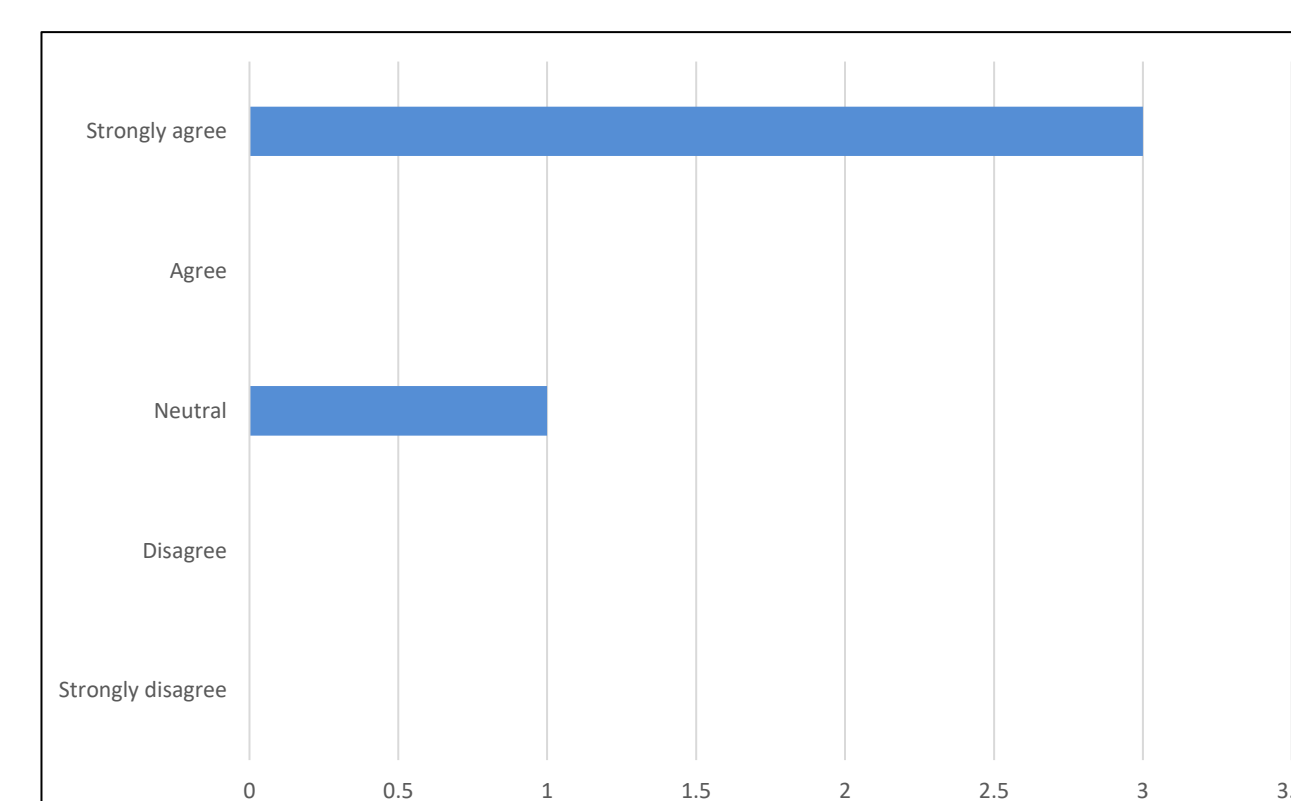


Figure 2. Likert Scale Responses: Methadone administration in cardiac surgery may improve perioperative analgesia and should be further explored as an analgesic option for cardiac surgery patients.

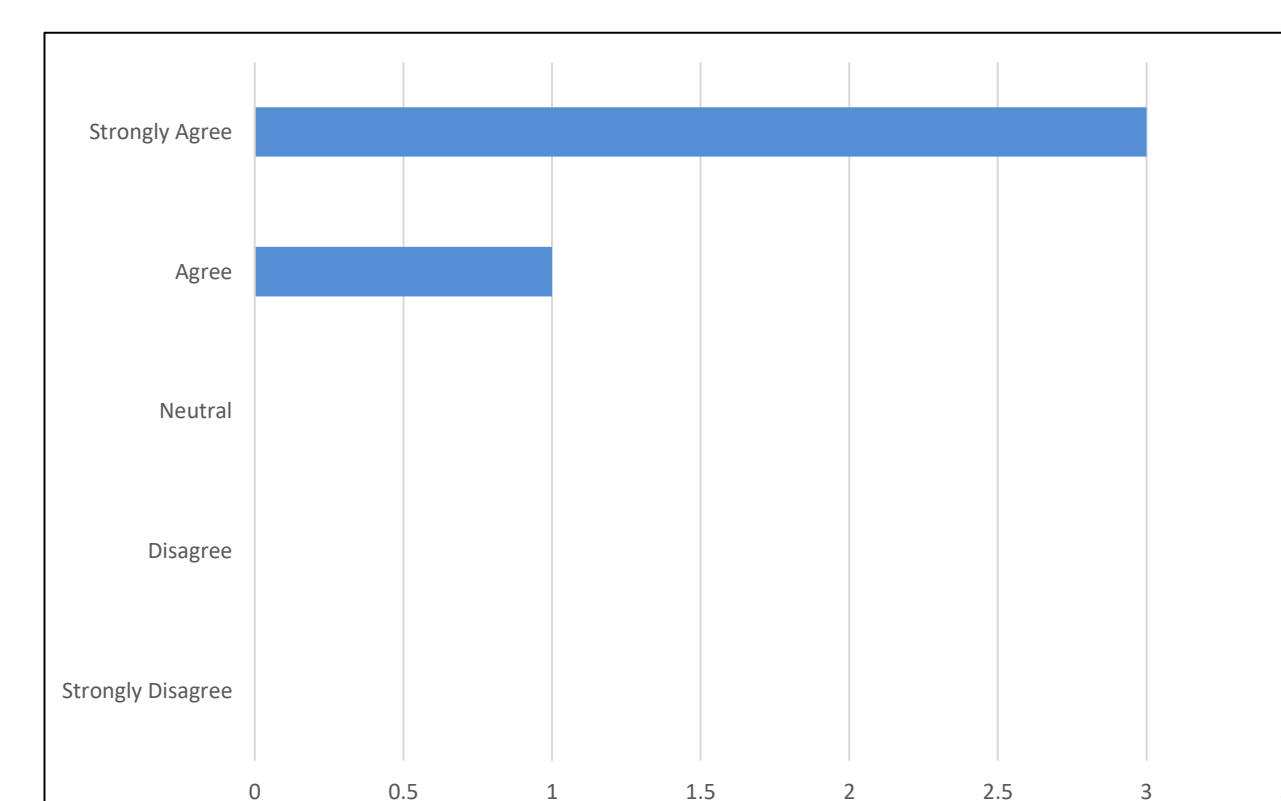


Figure 3. Likert Scale Responses: I would consider the administration of perioperative methadone in my own practice if an ERAS protocol for cardiac surgery patients was created.

1) Methadone exerts the majority of its clinical effects on which two receptor types?	GABA + Serotonin receptors Nicotine + Beta 3 receptors <b>Opioid + NMDA receptors</b> Opioid + GABA receptors
2) Which of the following best describes methadone's long duration of action?	Methadone is highly water soluble <b>Methadone is highly lipid soluble</b> Active metabolites account for the long duration of action Methadone irreversibly binds opioid receptors
3) Methadone modulates pain signal transmission and decreases the risk of peripheral and central sensitization. This is explained by which pain theory?	<b>Wind up phenomenon</b> Neuropathic Modulation Dorsal Horn Exposure
4) Which of the following is a well-known contraindication to methadone administration?	Seizure disorder <b>Baseline QT prolongation</b> History of opioid abuse
5) Which of the following is an effective analgesic dose of IV methadone?	50mg <b>10mg</b> 30mg 100mg
6) Clinicians may be most hesitant to administer methadone due to its...	<b>Variability in metabolism/long duration of action</b> Resistance to naloxone Beta antagonist effects Anticholinergic effects

Pre-test / Post-test survey questions.

## IMPACT ON PRACTICE

Enhanced provider knowledge on the clinical implications of methadone administration in cardiac surgery

Increased willingness to advocate for the development of methadone administration protocols in cardiac surgery

## CONCLUSIONS

01

Baseline knowledge and willingness to advocate for the development of a methadone administration protocol in cardiac surgery was completed.

02

A lack of pre-existing published protocols prevents the development of a new methadone protocol among cardiac surgery patients at the tertiary care facility.

03

By increasing provider knowledge on the administration of perioperative methadone, anesthesia providers may further evaluate its application in cardiac surgery.

## REFERENCES



References QR Code



Literature Review QR Code

Thank you to the following faculty for helping make this project possible:  
Dr. Mary Zerlan, DNP, CRNA, APRN  
Dr. Nicholas Collier, DNP, MBA, CRNA, APRN  
Dr. Michelle Ertel, DNP, CRNA, APRN



# Local Anesthetic Systemic Toxicity: LAST Protocol Development, Implementation, and Evaluation for Healthcare Providers

Rachel Vaughn, BSN, SRNA  
Southern Illinois University Edwardsville

## PROBLEM INTRODUCTION

Local anesthetic systemic toxicity is a rare, but life-threatening adverse physiological event that can occur after exposure to local anesthetics.

LAST can occur in any patient population, including obstetrics, pediatrics, and geriatrics.

Local anesthetic techniques are becoming more prevalent in surgical settings across the country, from dentistry to complex surgical cases.

Popularity with this type of anesthetic is increasing due to healthcare's desire to decrease opioid consumption

Reported incidence of LAST occurs in 1.04 per 1,000 peripheral nerve blocks.

(Macfarlane et al., 2021) (Mahajan & Derian, 2022) (Neal et al., 2018).

## LITERATURE REVIEW

The literature review aimed to define local anesthetic systemic toxicity and examine the best evidence-based practices for LAST interventions to develop a LAST protocol for Hillsboro hospital in Illinois.

### Definition

- Local anesthetics affect sodium channels. It inhibits depolarization and excites the central nervous system, resulting in seizure and cardiovascular collapse.
- Symptoms include circumoral numbness, metallic taste, mental status changes, dizziness, ringing in ears, anxiety, seizure, and cardiovascular collapse.

### Protocol Recommendations

- Education and a cognitive aid for treating LAST are paramount for improving adherence to treatment guidelines.
- Keep 20% lipid emulsion therapy and emergency airway supplies readily available
- Manage seizures with benzodiazepines. Avoid propofol, if possible.
- Low dose epinephrine recommended if cardiac arrest occurs (<1ug/kg).

(Vasques, 2015) (Safety Committee of Japanese Society of Anesthesiologists, 2019) (Rhee et al., 2019) (Wolfe & Spillars, 2018) (Neal et al., 2017) (Cropsey, 2015).

## PROJECT METHODS

The diagram illustrates the project methods through four vertical panels. From left to right: 1. A flowchart titled 'CALL FOR HELP' showing steps like 'Support Ventilation', 'Life Support', 'Stop Seizures', and 'Lipid Emulsion Therapy'. 2. A photograph of a 'LAST emergency kit' containing various medical supplies. 3. A screenshot of a PowerPoint presentation titled 'Local Anesthetic Systemic Toxicity (LAST)'. 4. A list of questions used for the pretest and posttest evaluation, such as 'What is the initial bolus dose of lipid emulsion therapy?' and 'When should LAST emergency kit be used?'. Below the panels, a large double-headed arrow indicates the flow of the project.

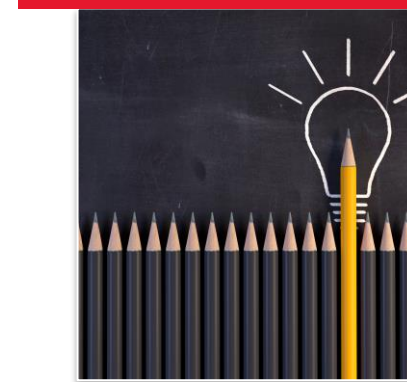
An evidence-based protocol in response to LAST was developed for Hillsboro Area Hospital in Illinois.

The protocol consisted of a LAST emergency kit, with intralipids and emergency airway equipment, and a step-by-step LAST response guide.

OR staff participated in a brief educational PowerPoint presentation. The presentation highlighted LAST recognition techniques and emergency response guidelines.

Participants' knowledge regarding LAST emergency response was evaluated before and after implementation of the protocol.

## IMPACT ON PRACTICE



Significant improvement in the post-test results suggests enriched staff knowledge.

The policy implementation empowers staff to treat LAST quickly and effectively.



The LAST response visual aid and emergency grab-and-go kit improves staff access to appropriate LAST treatments.

The project results suggest improved provider knowledge and comfort regarding a LAST emergency, which may improve patient outcomes.

## CONCLUSIONS

A well-structured protocol for managing local anesthetic systemic toxicity ensures patient safety and optimizes clinical outcomes. This project aimed to enhance healthcare providers' understanding of local anesthetics, including potential toxicity, the importance of early recognition, and proper intervention treatments.

The training focused on identifying early signs and symptoms of systemic toxicity, appropriate dose calculation, administration techniques, and the prompt initiation of treatment. The protocol delineated clear guidelines for monitoring patients during and after local anesthetic administration. Additionally, the protocol established a systematic approach for administering intralipid emulsion therapy, a key component of LAST management.

In summary, implementing a robust protocol for managing local anesthetic systemic toxicity is vital to enhance patient safety, improve outcomes, and reduce the morbidity and mortality associated with this potential adverse event.

## EVALUATION

### Implementation

- Pretest administered to assess baseline knowledge
- Education service held via PowerPoint presentation during a staff luncheon
- Posttest administered to assess presentation efficacy
- Both pre and posttest consisted of the same 5 multiple choice questions and one Likert scale question

### Evaluation

- Ten participants completed both the pre and post tests
- Results from the pretest were compared with the results of the posttest.
- Participants answered 31 out of 50 questions correctly on the pretest versus 46 out of 50 questions on the posttest

### Limitations

- No individual analysis possible due to lack of demographic data.
- Access to staff limited.
- Difficulty accessing pre and posttest due to unstable internet during the presentation

## References



# Methadone in Anesthesia: A Novel Approach to Opioid Reduction and Postoperative Pain Management

Haley Pschirrer, BSN, SRNA & Christy Durrwachter, BSN, SRNA  
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## PROBLEM INTRODUCTION

- Managing surgical pain is difficult despite advancements in medical technology
- Up to 50% of patients still report experiencing postoperative pain, even after minimally invasive procedures
- Intermittent administration of opioids leads to peaks and troughs in their levels, leading to persistent reporting of moderate to severe pain
- Patients experiencing prolonged postoperative pain are susceptible to chronic pain and subsequent opioid misuse

(Sunilkumar & Lockman, 2018).

## PROJECT METHODS

- Meeting with stakeholder to identify problem/need
- Proposal of project and objectives to stakeholder
- Review of literature and current evidence-based guidelines
- Development of methadone protocol
- Meeting with providers and staff to provide instruction on how/when to use the protocol
- Evaluation of pre- and post- presentation anonymous surveys to assess knowledge and willingness to implement into practice

## IMPACT ON PRACTICE

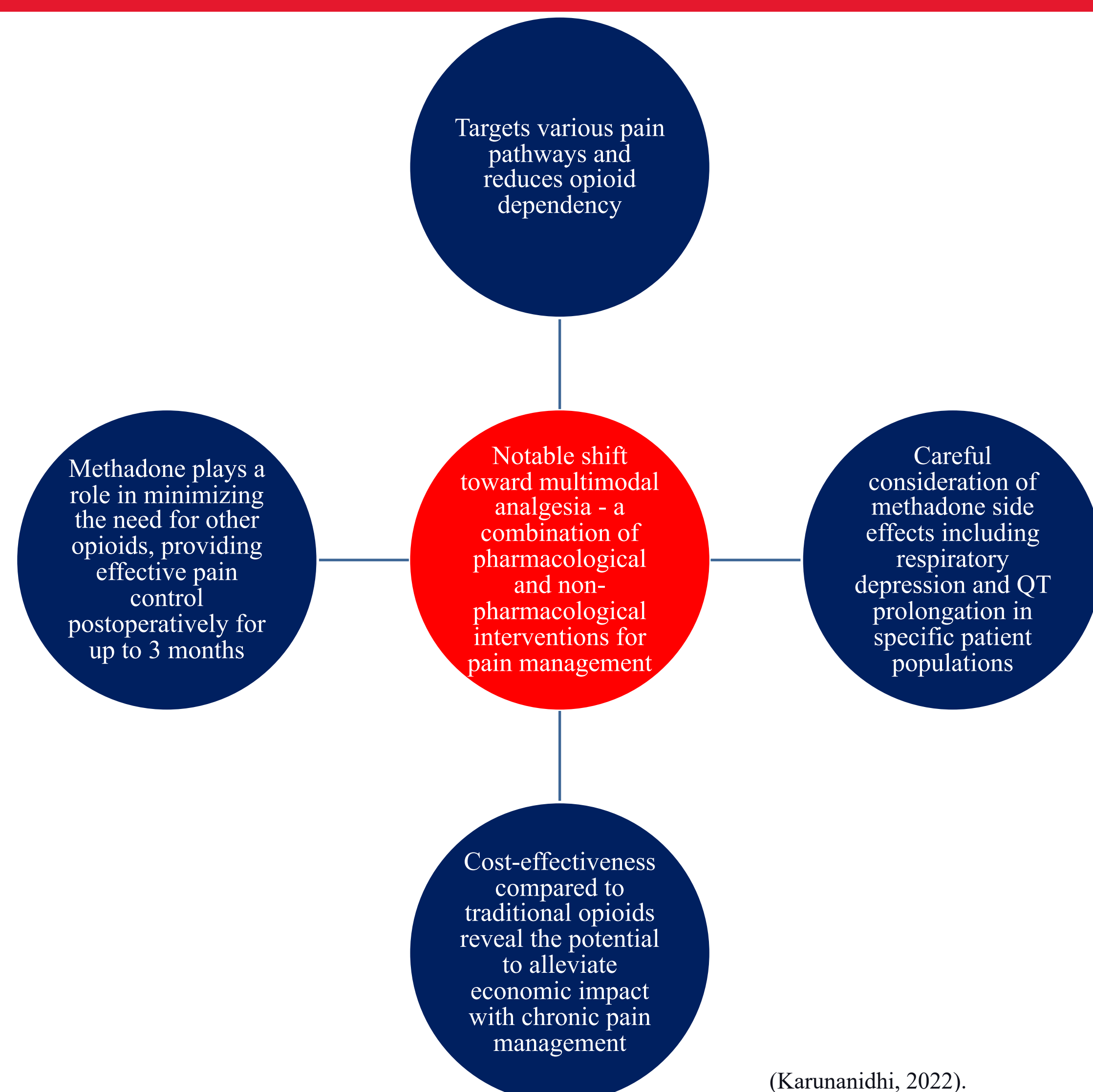
Significant reduction in opioid usage and a notable improvement in pain management efficacy

Transforms the conventional approach to pain control in surgical patients

Need for ongoing monitoring and evaluation to optimize methadone's benefits and mitigate risks

Reduced opioid-related complications and enhanced patient outcomes

## LITERATURE REVIEW



(Karunanidhi, 2022).

## EVALUATION

- Assessment of knowledge enhancement regarding methadone and gauging participants' inclination to incorporate methadone into their anesthetic plans
- Advancements in understanding were evident in aspects such as the incidence of postoperative pain, methadone's mechanism of action, its elimination half-life, peak respiratory effects, interventions for respiratory depression, and optimal dosing
- One area of inconsistency emerged regarding the peak respiratory depressant effect of methadone
- Responses indicated an overwhelming likelihood among attendees to adopt alternative therapies, including methadone, for reducing postoperative opioid consumption
- All 12 participants reported an enhancement in their understanding of methadone's role in anesthesia and expressed a unanimous willingness to recommend the protocol to their colleagues

## CONCLUSIONS

Methadone has considerable potential in postoperative pain management

Methadone has a dual function as an opioid agonist and NMDA receptor antagonist which diminishes the development of chronic pain

Future endeavors should focus on further refining dosing guidelines, expanding methadone's application across diverse surgical procedures, and enhancing education and awareness about its role in postoperative pain management

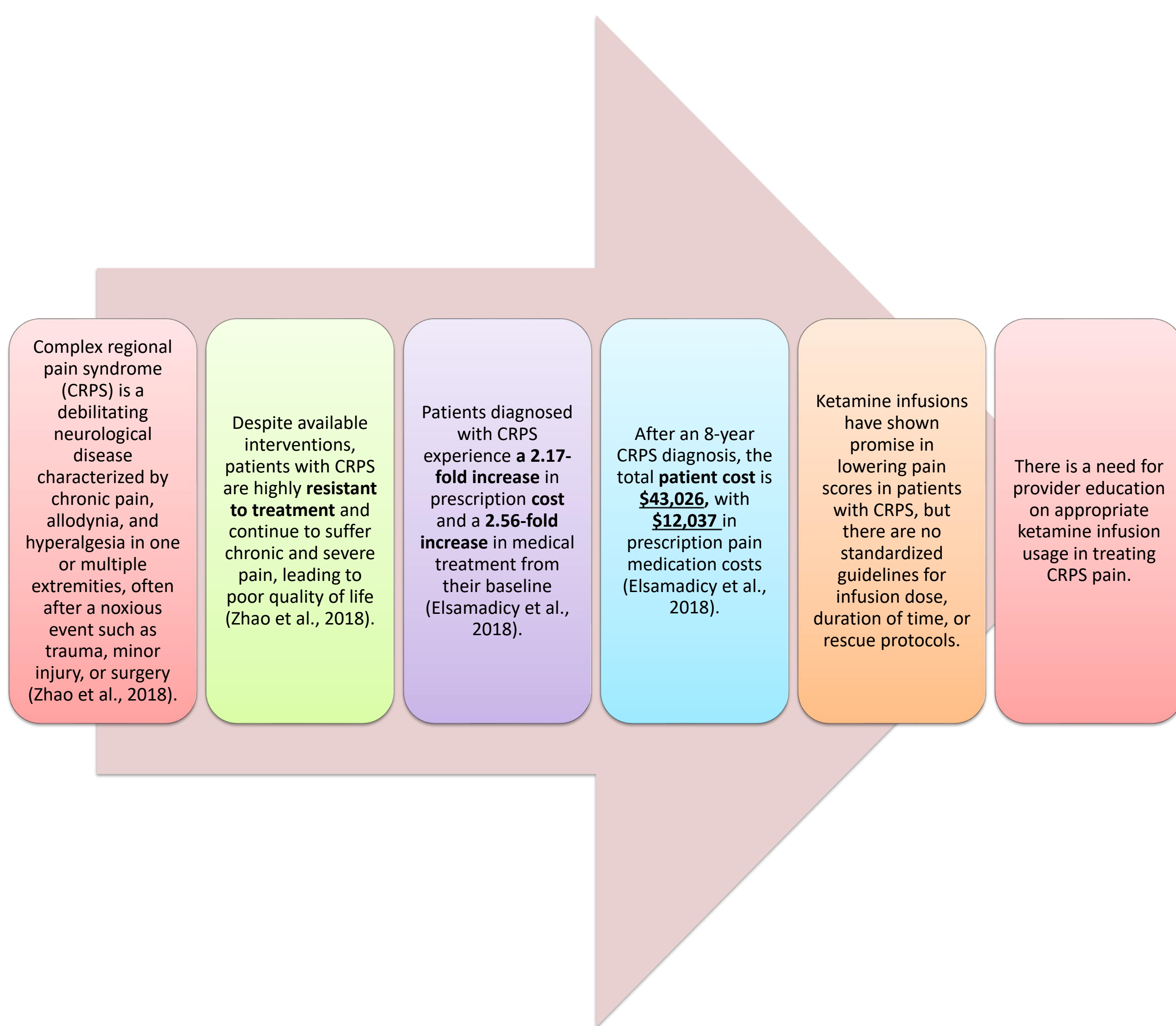


Scan me!

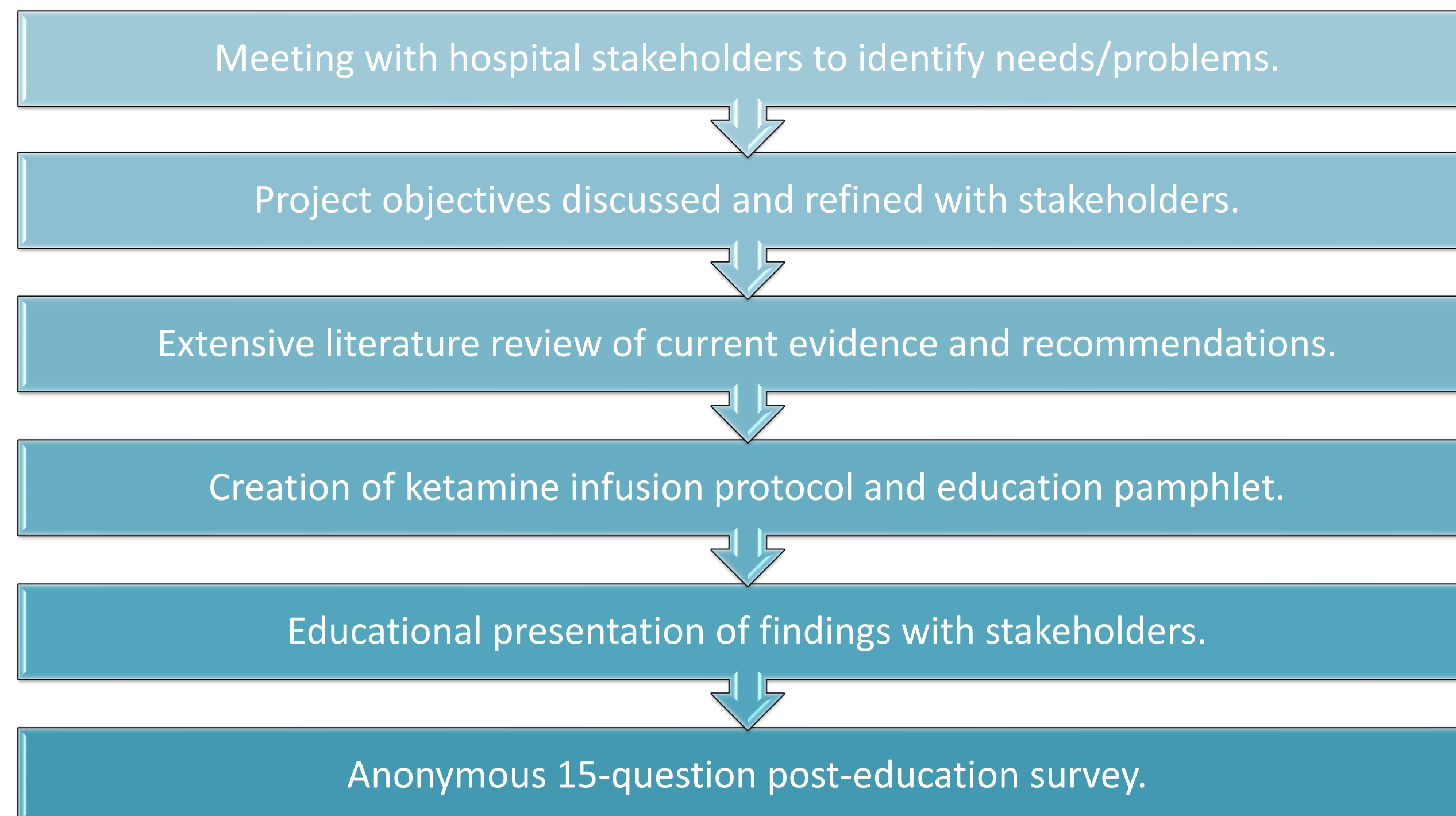
# Ketamine Infusion Protocol & Patient Education Pamphlet for Complex Regional Pain Syndrome

Ricardo Aranda, BSN, SRNA & Giles Howard, BSN, SRNA  
Southern Illinois University Edwardsville

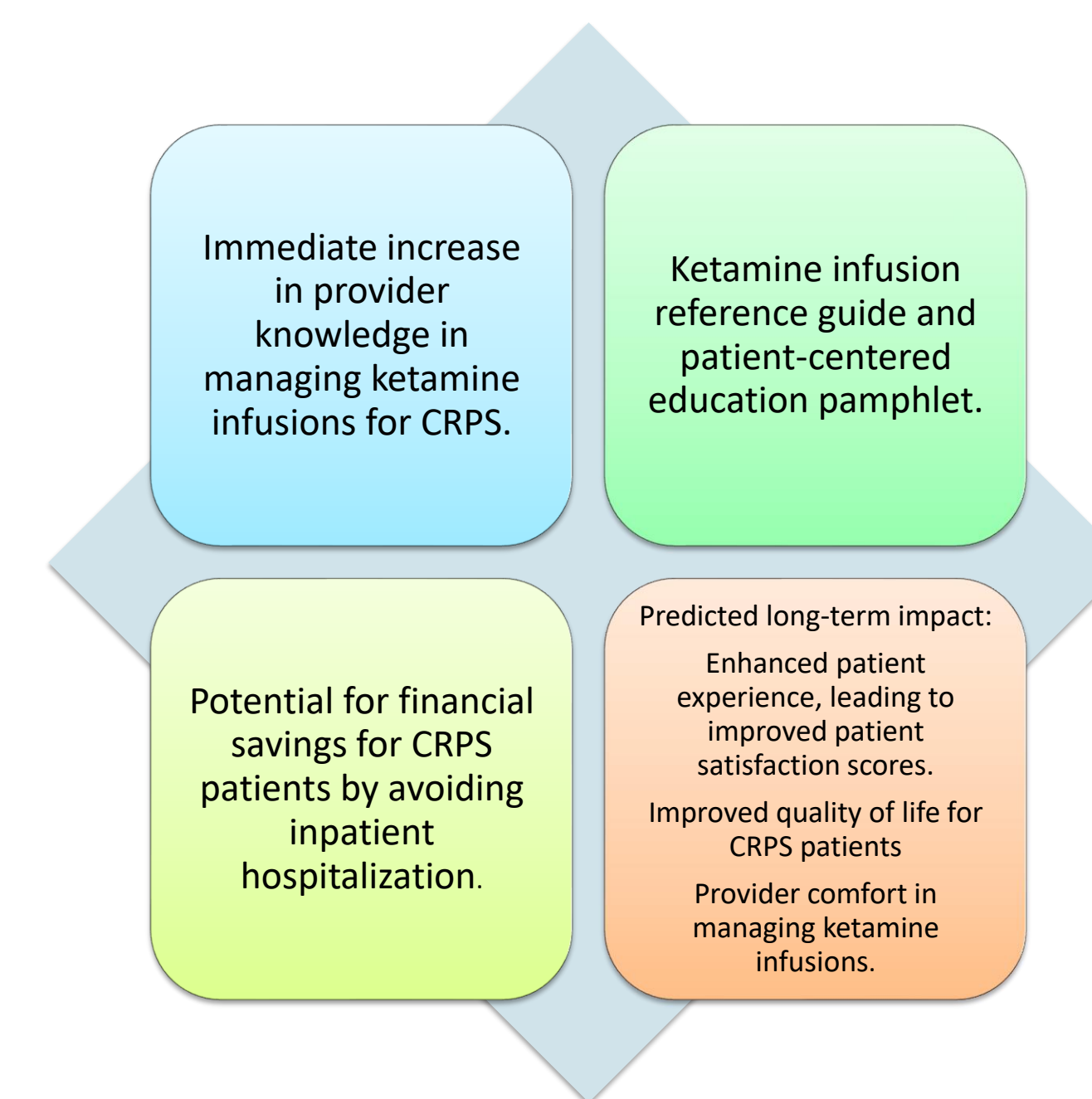
## PROBLEM INTRODUCTION



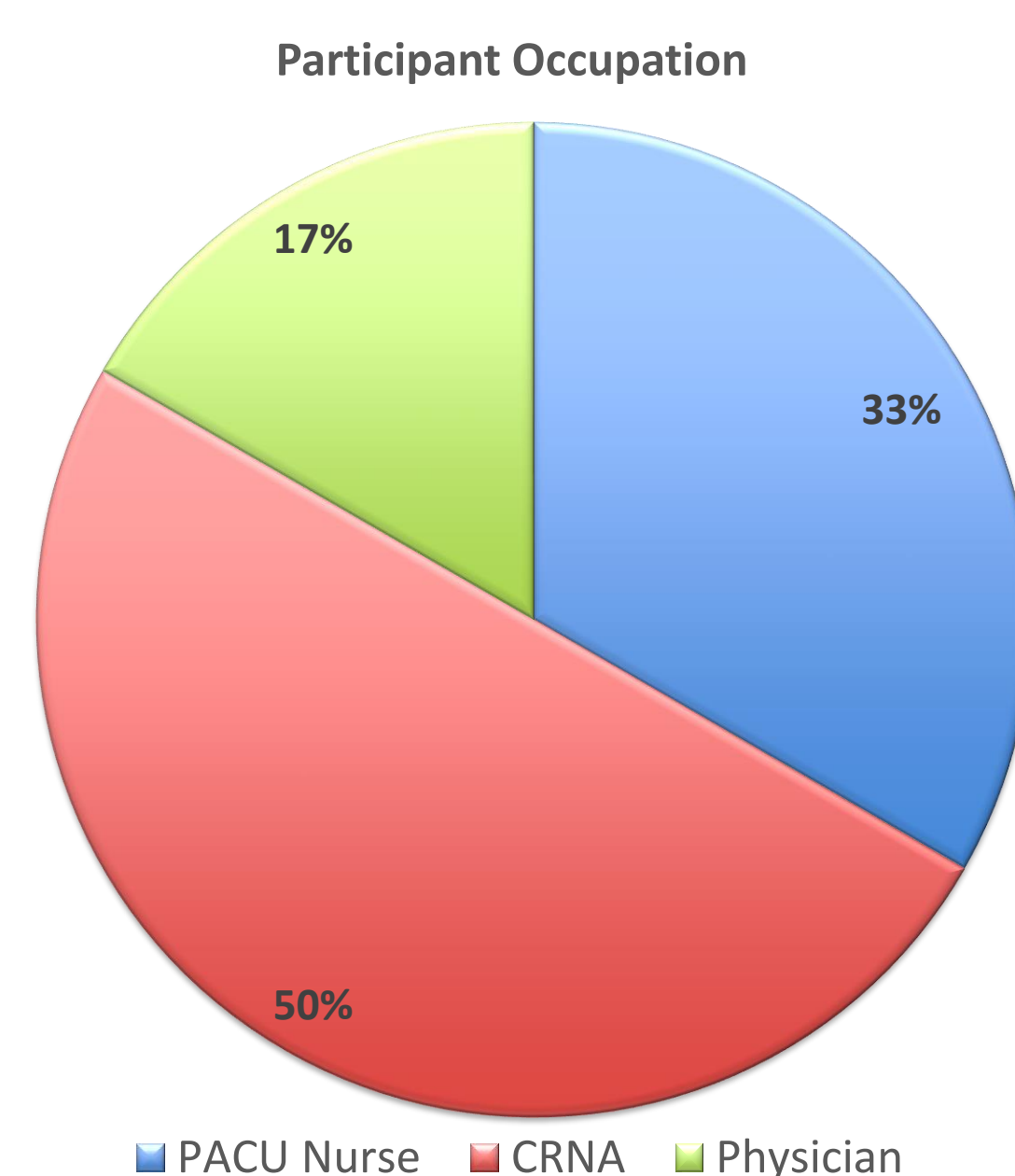
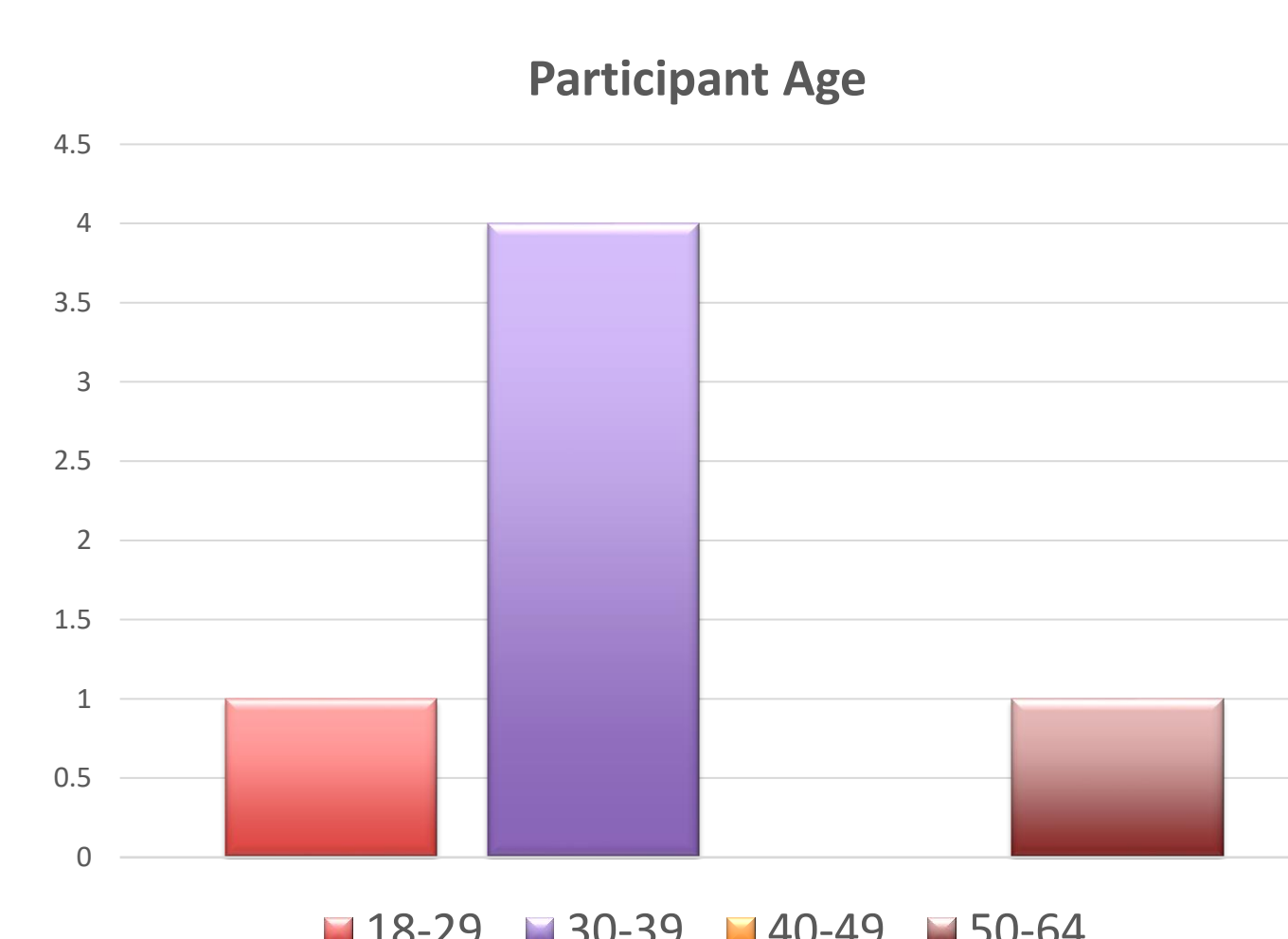
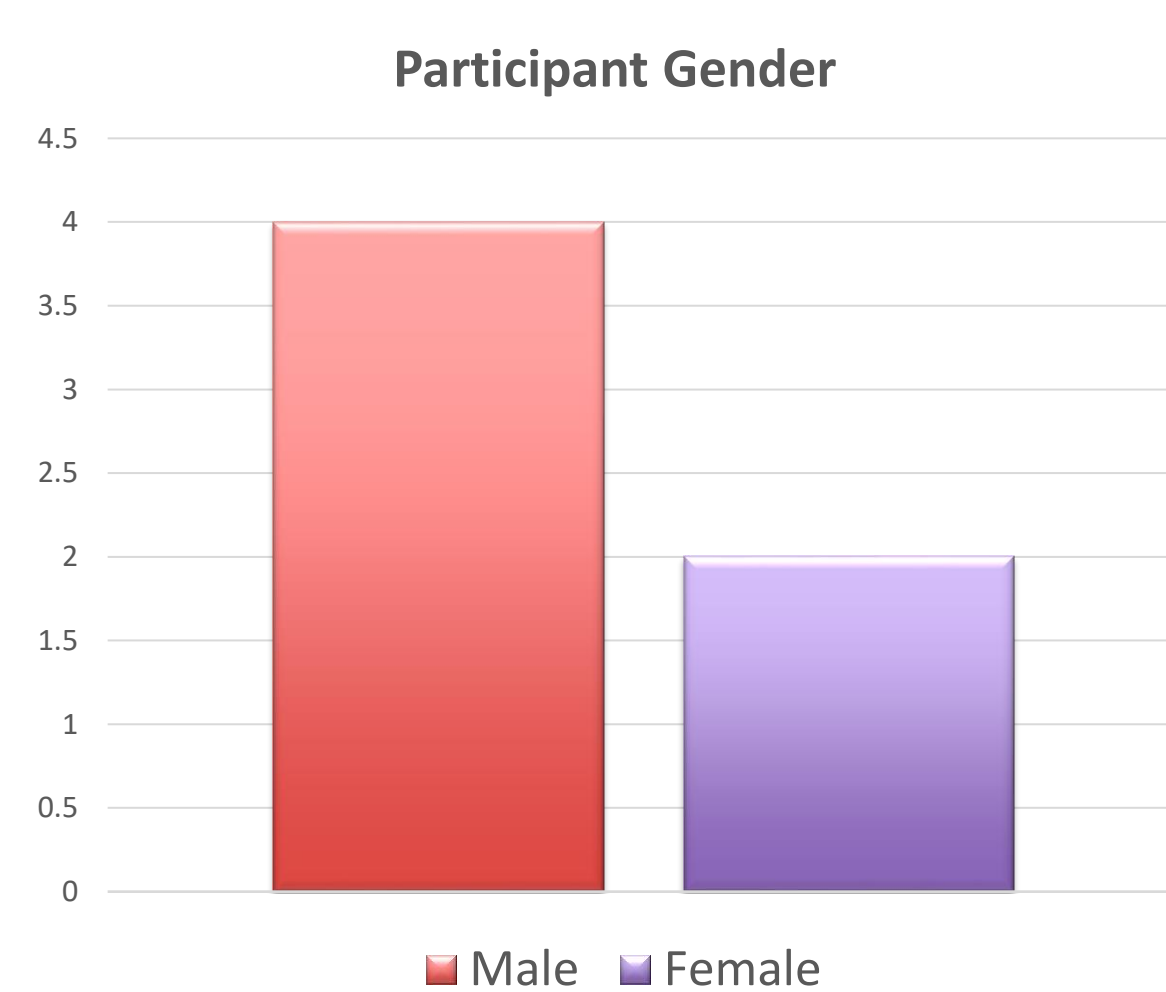
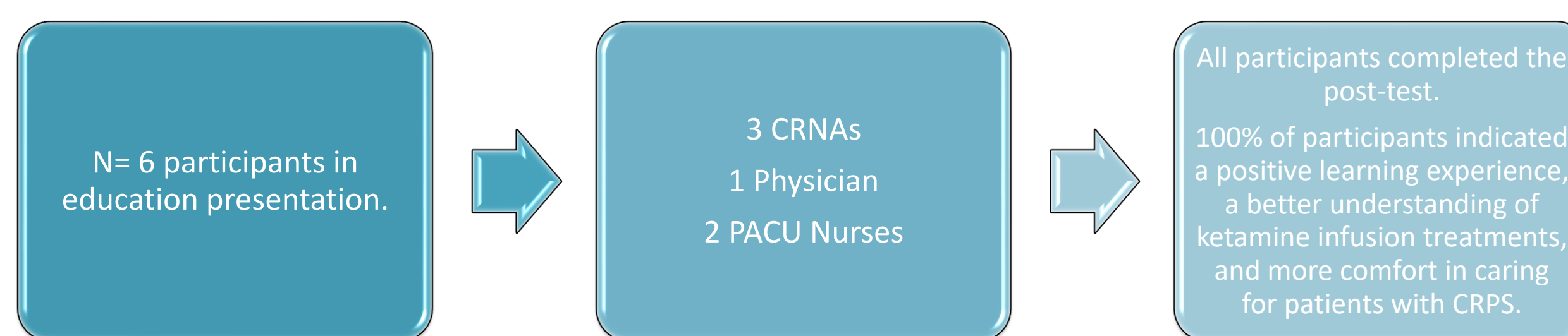
## PROJECT METHODS



## IMPACT ON PRACTICE



## EVALUATION



## LITERATURE REVIEW

101 out of 114 patients experienced a significant decrease in pain scores & increase in pain thresholds throughout treatment (F= 66.49, P< 0.001). Outcomes correlated with improvement in pain thresholds ( $\eta= 0.801$ ) (Kilpatrick et al., 2020).

Four days of outpatient ketamine infusions are sufficient for the treatment of CRPS pain in the lower extremities. Treating upper extremities pain may require outpatient infusions longer than four days (Kilpatrick et al., 2020).

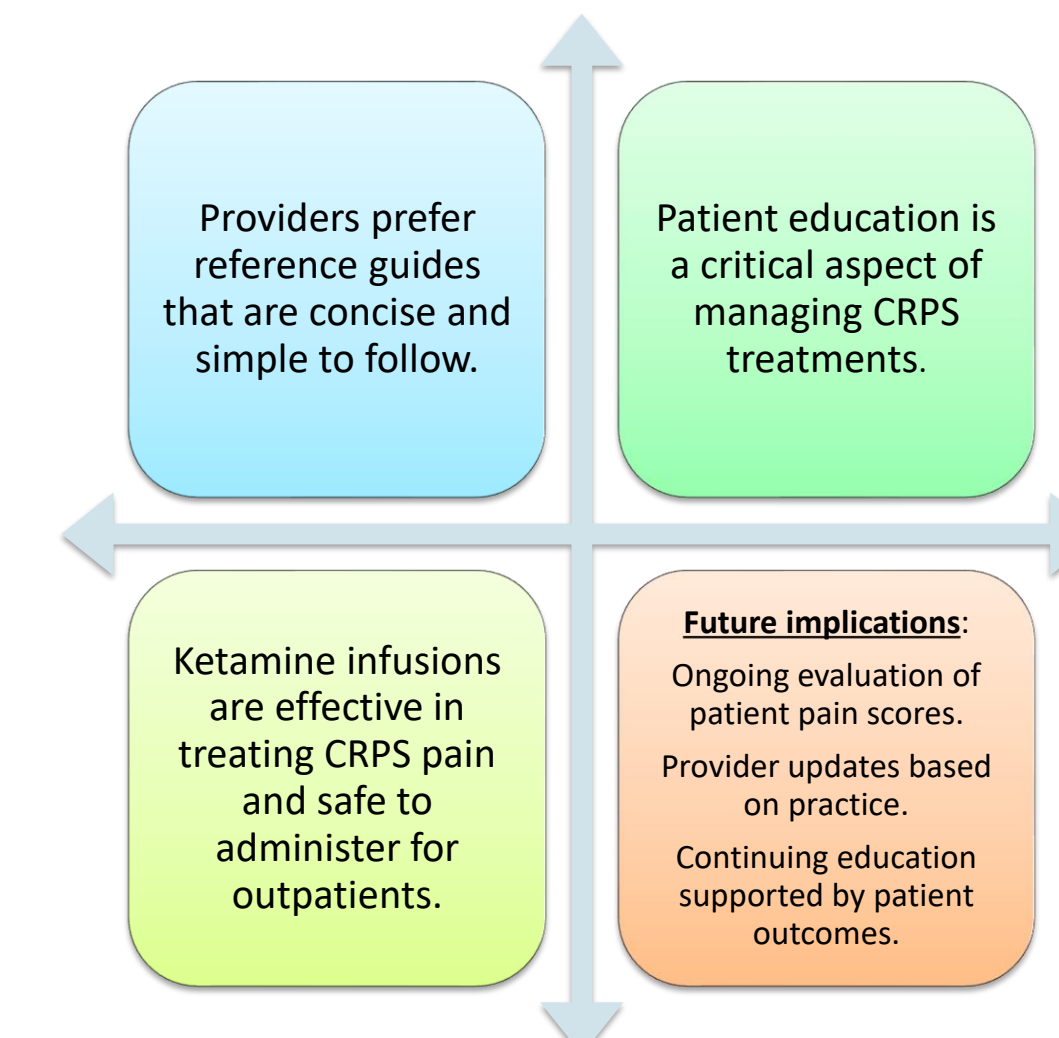
Infusions of 0.5 to 2 mg/kg per hour for chronic pain conditions are generally well tolerated in patients with chronic pain conditions (Cohen et al., 2018).

At doses exceeding 1 mg/kg per hour, a monitored setting containing resuscitative equipment, immediate access to rescue medications, and personnel who can treat emergencies is recommended (Cohen et al., 2018).

Positive responses to ketamine infusions should include objective measures of benefit in addition to satisfaction, such as a  $\geq 30\%$  decrease in pain score or comparable validated measures for different conditions (Cohen et al., 2018).

Practice guidelines recommend initiating therapy with 80 mg of ketamine infused over at least two hours (Cohen et al., 2018).

## CONCLUSIONS



## Acknowledgments and References

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