

## Nonpharmacologic Pediatric Distraction Techniques

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## PROBLEM INTRODUCTION

- 60-80% of pediatric patients will experience anxiety during the perioperative process (Hayles, 2010)
- Untreated anxiety can manifest as a variety of maladaptive behaviors that can persist up to 6 months postoperatively (Mouton et al., 2011)
- Utilization of distraction techniques can be as effective as pharmacologic methods (Chen & Wenzel, 2017)
- **A tool referencing the current available pharmacologic and non-pharmacologic methods to reduce perioperative pediatric anxiety does not currently exist at Memorial Hospital Belleville r/ t:**
  - *Potential knowledge deficit of pediatric stages of development and correlating appropriate distraction techniques*
  - *Sole utilization of pharmacologic methods with disregard for non-pharmacologic techniques that can be used in conjunction*
  - *Tendency to utilize a predetermined anesthesia plan as opposed to tailoring techniques to the individual child*

## PROJECT METHODS

**Design:**

- Non-Experimental Quality Improvement Project

### Setting

- Operating room at a mid-sized acute care Magnet designated hospital in Illinois

**Sample**

- Convenience sample of certified registered nurse anesthetists (CRNAs), anesthesiologists, student nurse anesthetists, and registered nurses

## Implementation

- Educational PowerPoint presentation
- Copy of presentation & reference tool given to providers for personal use & as a visual aid to reinforce material
- Laminated reference tool placed in pediatric anesthesia carts and designated preoperative areas

## Evaluation

- Voluntary completion of post-implementation survey

## LITERATURE REVIEW

## Pediatric Anxiety

- Can manifest during the preoperative period as a result of fear of the unknown, loss of control, and separation from caregiver (Brown et al., 2009)
- **Observable behaviors can include agitation, crying, screaming, verbally protesting, and dissociation from normal behaviors** (Brown et al., 2009)
- Can continue through induction of anesthesia, leading to increased risk of breath-holding, laryngospasm, and bronchospasm (Smith, 2002)
- Following emergence, can exhibit delirium, increased pain requiring analgesics, and anxiety-related behavior changes (Squire et al., 2010)

## Pharmacological Treatment Options

- Midazolam
  - Most commonly administered anxiolytic (Mountain et al., 2011)
  - Oral, intranasal, intramuscular, and rectal administration (Javie, 2019)
- Dexmedetomidine
  - Most commonly oral or intranasal routes (Siman et al., 2013)
  - Intraoperative administration shown to decrease emergence delirium (Chen & Chou, 2017)
- Ketamine
  - Complete anesthetic = analgesia, amnesia, anxiolysis, and sedation (Khurmi et al., 2017)
  - Often reserved for patients that are combative or developmentally delayed
  - Frequently administered via IM injection (Javie, 2019)

## Nonpharmacologic Interventions

- **Parental Presence**
  - Often used in conjunction with other methods
  - Requires education and proper preparation of the parent (Agostini et al., 2014)
  - Delays the onset of separation anxiety (Scully, 2012)
- **Play Therapy**
  - Important for normal growth and development (Jones, 2018)
  - Audio visual media is widely available and allows for a variety of age-appropriate content (Chen et al., 2016)
  - Shown to decrease the incidence of maladaptive behaviors and increase acceptance of the anesthesia mask for induction (Dowling et al., 2018)
  - **Audiovisual distraction was shown to be equal or superior in decreasing pediatric anxiety levels when compared to all other methods** (Dowling et al., 2018)
- Soap bubbles are an easy, inexpensive, and safe method of refocusing the child's attention (Gragston et al., 2018)
- Storybooks and coloring can help familiarize the child with what events and equipment are to be expected (Al-Tahseen et al., 2016)
- Prior interaction with the anesthetic mask can help decrease the anxiety that peaks with its placement during the induction process (Marques et al., 2019)
- Lightly scenting the mask with a flavor of the child's choice can disguise the smell of the volatile anesthetic (Parvati et al., 2013)
- Music therapy refocuses the child's attention on something enjoyable and familiar and can be provided via tablet, phone, computer, radio, or singing (Sageaman et al., 2010)

## IMPACT ON PRACTICE

- The initial impact of this project was to provide a clinical resource tool to increase provider knowledge of techniques to decrease pediatric anxiety and to encourage the utilization of nonpharmacologic methods
- The long-term impact of this project includes the continued use of the techniques provided and the potential decreased cost to the facility and improvement of patient outcomes.
- Alleviation of pediatric anxiety can decrease the incidence of negative behaviors and emergence delirium in the recovery areas, reducing the potential cost to the facility for longer than anticipated stays

## EVALUATION

	Number of Providers	Awareness	%
Anesthesiologist	2	2	100%
CRNA	11	6	55%
RN	1	0	0%
SRNA	3	3	100%

- A total of 17 surveys were returned and analyzed.
- Prior to the presentation, 6 providers reported being unaware of the effects pediatric anxiety can have during the postoperative period. Following dissemination, 5 of these providers indicated a perceived increase knowledge relating to this topic
- Overall, providers expressed increased feelings of preparedness in caring for this patient population

## CONCLUSION

- **Alleviating pediatric anxiety is crucial to the care of this patient population**
- Age and developmental stage should be considered to offer appropriate interventions
- Staff awareness of multiple methods allows for the creation of individualized care plans
- Nonpharmacological methods can provide anxiolysis without the increased risk of physiological side effects

## REFERENCE TOOL

[illegible]

## REFERENCES





# Increasing Obesity Education in an Underserved Latino Population

Kelsey Beard, BSN, RN and Morgan Lippert, BSN, RN  
Southern Illinois University Edwardsville

## Background

### Clinical Relevance

- Approximately 45% of Hispanic adults in the US are considered to be obese (CDC, 2021).
- Not only are Hispanics more likely to develop obesity, but they also face multiple barriers and disparities when it comes to healthcare access and treatment.

### Problem

- Obesity increases the risk of life-threatening comorbidities such as cardiovascular disease, type 2 diabetes, respiratory issues, joint and musculoskeletal disorders, gastrointestinal disorders, and certain cancers (Fruh, 2017).
- A clinic serving a large Hispanic population, had no education tools for obesity in English or Spanish despite the high patient volume with this condition.

## LITERATURE REVIEW

Barriers for Spanish Speaking patients- language, culture, genetics, support, environment, income, resources, health literacy

Lack of resources- transportation, childcare, no phone or internet at home, and monetary means to pay for healthy food options

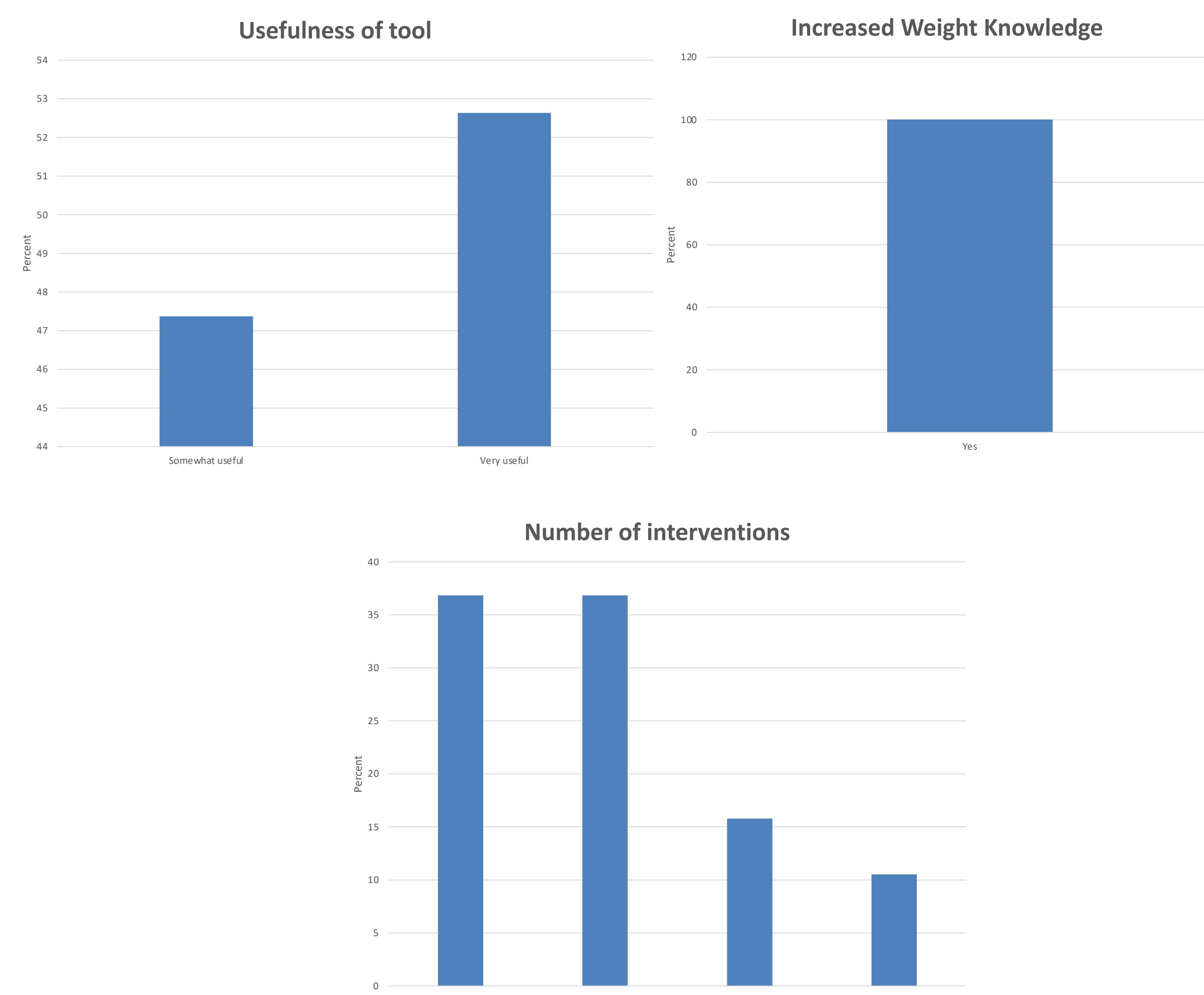
In the Latino culture a fuller body type is often portrayed as attractive  
Acculturation to readily available fast foods, diet high in carbohydrates from country-of-origin

Language/cultural barriers  
Limited number of Spanish speaking providers  
Reluctance to seek care  
Misunderstanding of health information.

## PROJECT METHODS

- Patients received an obesity education tool in either Spanish or English based on BMI and language need.
- The education tool focused on obesity, associated health risks, lifestyle changes, and impact of obesity on child-bearing. Additional tools included a BMI chart and a handout on physical activity.
- Patients were given pre and post education tool surveys to assess the usefulness of the tool. Survey results were collected in December 2021.
- Lewin's Change Model of unfreezing, change, and refreezing was used to guide this project.

## EVALUATION



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## RESULTS

- A total of 19 patients participated in the project.
- On pre-survey, 68.4% reported no previous knowledge on weight management. Only 31.6% reported having previous weight management knowledge.
- Post-education, 52.6% of the participants rated the tool as 'very useful, and 47.4% as 'somewhat useful'.
- In regard to interventions to improve their weight, 36.8% of the participants marked one intervention they thought they could complete, 36.8% marked two interventions, 15.8% marked three interventions, and 10.5% of participants marked four.

## IMPACT ON PRACTICE

- Implementation and evaluation of an obesity education tool for Spanish speaking Hispanic patients that can be used long-term in the clinic setting.
- With continued use of the tool, potential long-term outcomes could include improving BMIs of patients with or at risk for obesity in the population this clinic serves.
- Hispanic patients at this clinic can now receive education that is both linguistically and culturally sensitive.
- Routine reevaluation of the education tool will be necessary to ensure up to date information.

## CONCLUSIONS

- Language and cultural barriers that Hispanic patients face have an influence in access to care, health disparities, and obesity related complications.
- Educational tools targeted at this specific population and tailored to be patient specific can help increase obesity awareness and education among Hispanics.
- Long-term follow up would be needed to better assess outcomes related to the use of this educational tool.



# Development of Evidence-Based Rubrics and Instructional Videos for Anesthesia Induction Sequences

James Canny, BSN, SRNA Nathan Carroll, BSN, SRNA  
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## PROBLEM INTRODUCTION

- Typical induction and rapid sequence induction (RSI) are methods used to establish general anesthesia.
- Standardized protocols provide a dependable approach for educating student registered nurse anesthetists (SRNAs).
- SIUE rubrics last updated in 2006
- Although classroom didactic and physical training are necessary, observational learning can help to further enhance motor abilities.

## LITERATURE REVIEW

### Many aspects still relevant from 2006

- Standardized checklist (Jelacic et al., 2019)
- Preoxygenation (Klucka et al., 2020)
- Sniffing position (Acharya et al., 2019)
- Positive pressure ventilation with typical sequence induction but not with RSI (El-Orbany & Connolly, 2010)
- Cricoid pressure with RSI (Birenbaum et al., 2019)
- Confirm endotracheal tube placement with end-tidal CO2 (Lederman, 2011)

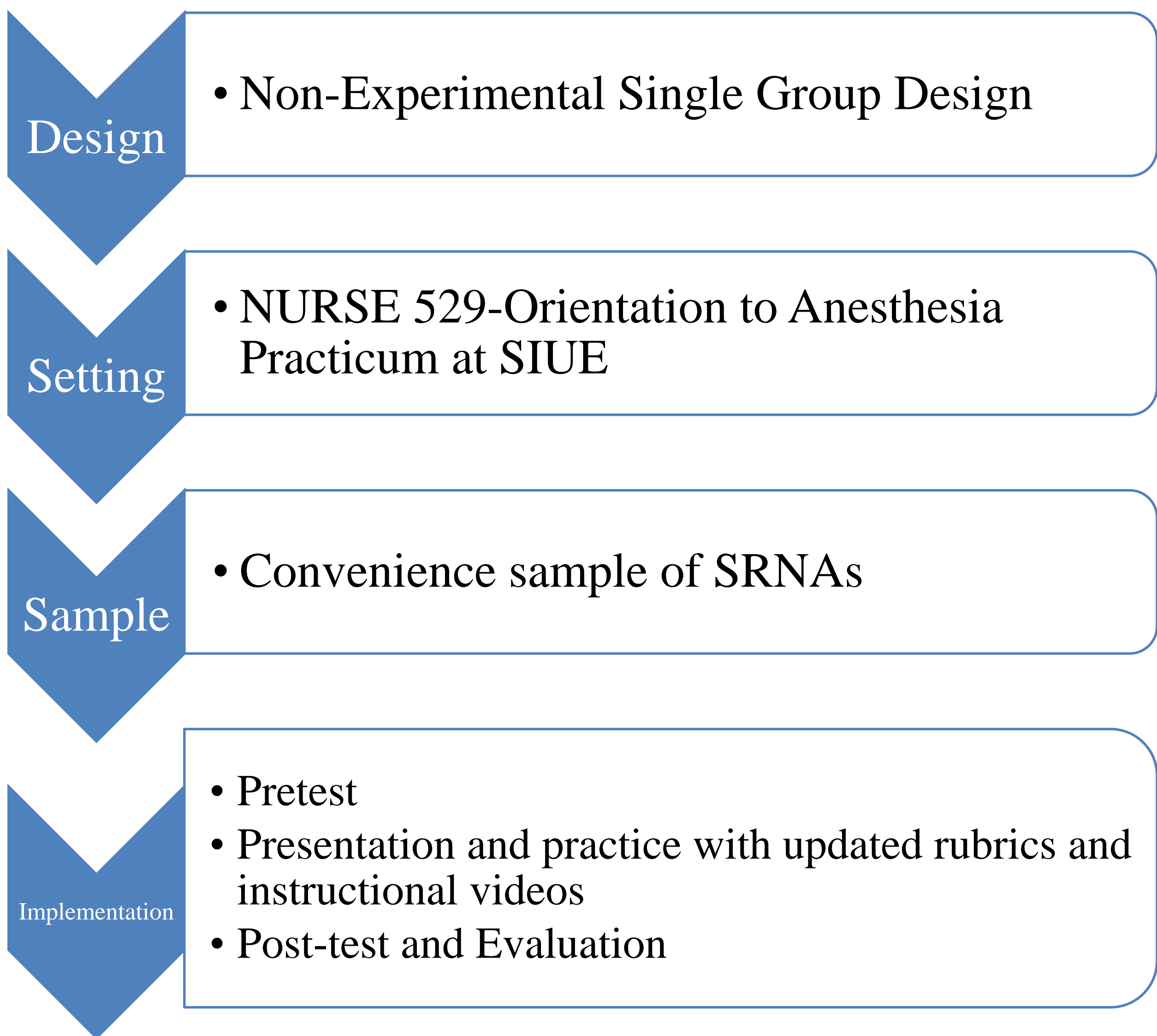
### New Additions

- Utilize multiple airway assessment tools –mallampati, upper lip bite test, thyromental distance (Roth et al., 2019)
- Double glove (Jaffe, 2019)
- Single use tape (Krug et al., 2011)

### Observational Learning

- Proven effective in assisting with instruction of higher cognitive motor processes such as induction sequences (Cordovani & Cordovani, 2016).
- Benefit is further augmented when the learner is exposed to both a novice and an expert performing the skill (Andrieux & Proteau, 2013).

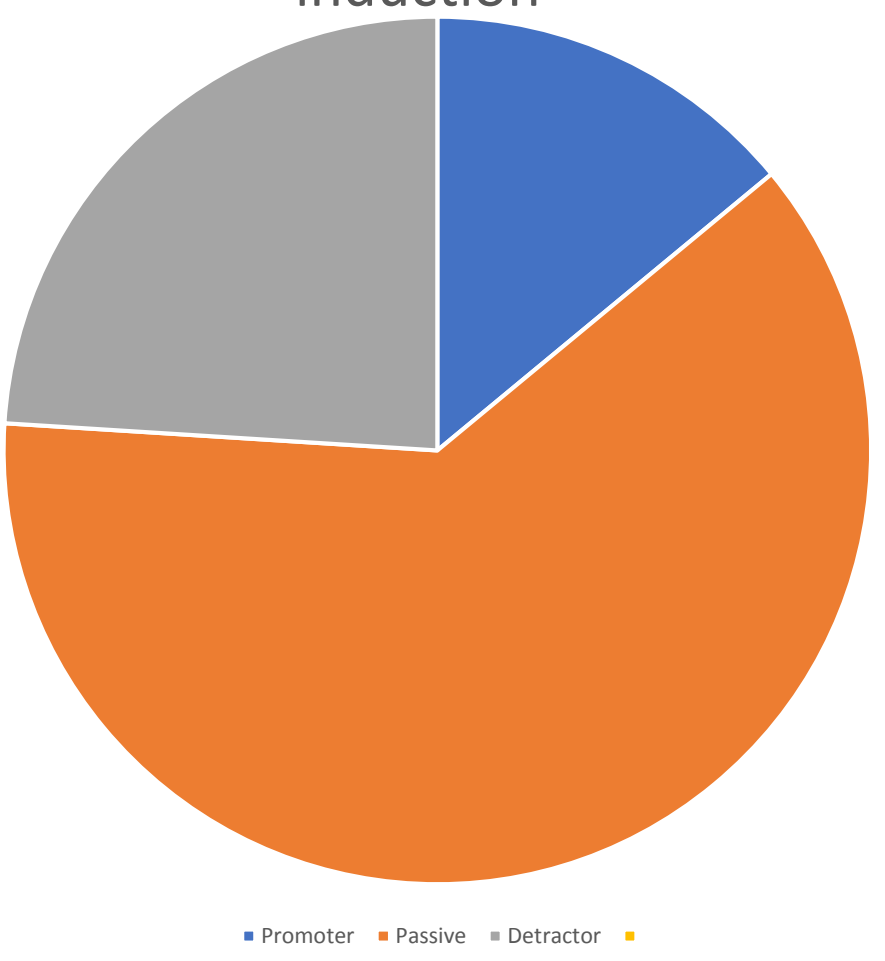
## PROJECT METHODS



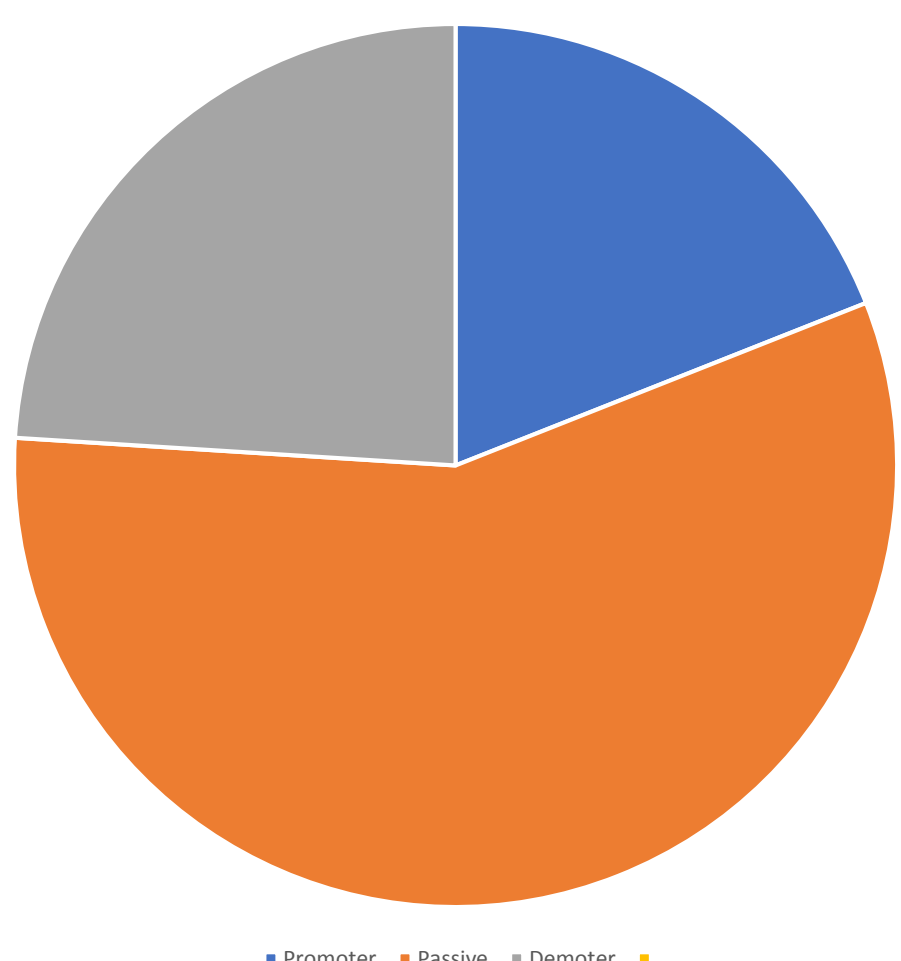
## EVALUATION

- 29 Pre-test completed
- Pre-test average score of 78%
- 20 Post-test completed
- Post-test average score of 89%

Confidence in performing typical sequence induction



Confidence in performing RSI



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## INSTRUCTIONAL VIDEOS

Typical Sequence Induction:  
Novice



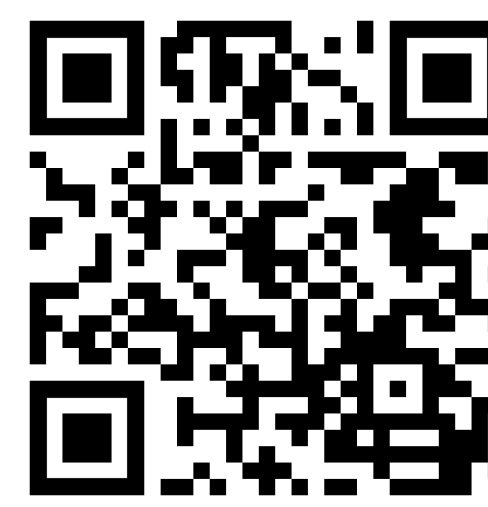
Rapid Sequence Induction:  
Novice



Typical Sequence Induction:  
Expert



Rapid Sequence Induction:  
Expert



## IMPACT ON PRACTICE

- Rubrics up-to-date with best practice recommendations
- Foundation created for future observational learning
- Project can be built upon by updating the existing rubrics for additional anesthesia skills (i.e., epidural placement, spinal placement)

## CONCLUSIONS

- Safe and effective induction of anesthesia is a fundamental skill for every anesthesia provider.
- Positive responses to the instructional videos validate observational learning as an effective teaching method
- Highlights the need for creation of further videos to accompany any skills rubrics



Final Reference List



# Exploring the Use of Telehealth in a School-Based Health Center

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## PROBLEM INTRODUCTION

- Medically-underserved areas (MUA) have too few primary caregivers, high infant mortality, prevalent poverty, or a high elderly population (HRSA, n.d.)
- Madison County, Illinois has been designated as a MUA since 1994, (Data USA, 2018). The Collinsville School District resides in Madison County.
- Solutions to care in medically-underserved areas for the pediatric population can be remedied using school-based health clinics incorporating telehealth services.

**PURPOSE:** To explore the perceived benefits of remote telehealth assessment kits and their potential for use in school-based settings.

## PROJECT METHODS

- The project goal was to demonstrate the expansive capabilities of telehealth medicine by obtaining portable telemedicine kits and exhibiting their potential for use in needs-based settings.
- To initiate funding for the portable telemedicine kits, locating grants, scholarships, and awards was necessary. Ultimately, one local award was received through the SIUE Meridian Society, and \$2,750 was awarded.
- TytoCare portable telemedicine kit was purchased. Its usefulness was demonstrated to the Collinsville School-Based Health Clinic staff and DNP students at SIUE. The school-based health clinic is now on its way toward assisting students and their families with healthcare assistance, despite the Covid-19 pandemic.

## EVALUATION

- Participants who completed the telehealth equipment training consisted of 11 school nurses from the Collinsville School District and 58 Doctor of Nursing Practice students (DNP).
- Sixty-nine (100%) of trainees completed the pre-survey, but 11 trainees failed to complete the post-survey.

Responses	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)	Total Responses N (%)
Please tell us your level of agreement with the following statements:						
“The TytoCare telehealth equipment is easy to use.”						
	22 (37.9)	32 (55.2)	4 (6.9)	0 (0.0)	0 (0.0)	58 (100)
“I am comfortable with using telehealth in my future practice.”						
	25 (43.1)	28 (48.3)	5 (8.6)	0 (0.0)	0 (0.0)	58 (100)

## IMPACT ON PRACTICE

- This technology may represent a new and innovative method of reaching students who may not otherwise receive healthcare.
- SIUE DNP students had the opportunity to practice telehealth visits using portable telemedicine kits. Future DNP students will benefit from practicing with the equipment in a simulated environment throughout their program, thus improving their practice competency in healthcare, including telehealth.
- The Collinsville School District (CSD) was made aware of the potential of telehealth in their school setting to provide more comprehensive care to their students. In collaboration with SIUE School of Nursing, the CSD seeks to bring telemedicine capabilities to current and future students.
- The long-term impact will be seen in the participants’ willingness to engage in the dynamic world of health care through telehealth.

## LITERATURE REVIEW

- Barriers preventing or limiting access to health care services increases the risk of poor health outcomes and disparities (Healthy People 2020, 2020).
- Barriers to care include limited availability of healthcare resources such as lack of health care providers, inaccessible clinics and hospitals, and inadequate insurance coverage. Expanding access to health services is a crucial step in reducing health disparities.
- Nearly 67 million Americans live in federally designated primary care Health Professional Shortage Areas (Goodfellow et al., 2016).
- The World Health Organization (WHO) recognizes telehealth services as an innovative delivery of healthcare services. The WHO endorses virtual communication as in the best interest of advancing the health of individuals and communities (Tsai et al., 2019).

## CONCLUSIONS

- School-based health centers have been shown to improve students’ physical health and have helped enhance their educational endeavors (Keeton et al., 2012).
- School-based health centers and the use of telehealth services are feasible solutions for decreasing barriers to care in medically-underserved areas.
- Providing telehealth in school-based health centers benefits the community by decreasing unnecessary emergency department visits, preventing the spread of sexually transmitted diseases through timely education and treatment, and reducing school absences (Ran et al., 2016).



# Creating a guideline for STI testing in the pediatric population

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## PROBLEM INTRODUCTION

- Almost half of the 26 million new sexually transmitted infections (STIs) that occurred in 2018 were among young people aged 15-24.
- One in four sexually active adolescent females had an STI, such as chlamydia and gonorrhea (Centers for Disease Control, 2019).
- Rural pediatric clinic was requesting an updated STI screening/testing guideline.
- The goal of this project was to improve provider knowledge and compliance regarding CDC recommended STI screening/testing.
- Multiple barriers maintaining confidentiality in teenage to adolescent population regarding STI screening, education, and treatment.

## LITERATURE REVIEW

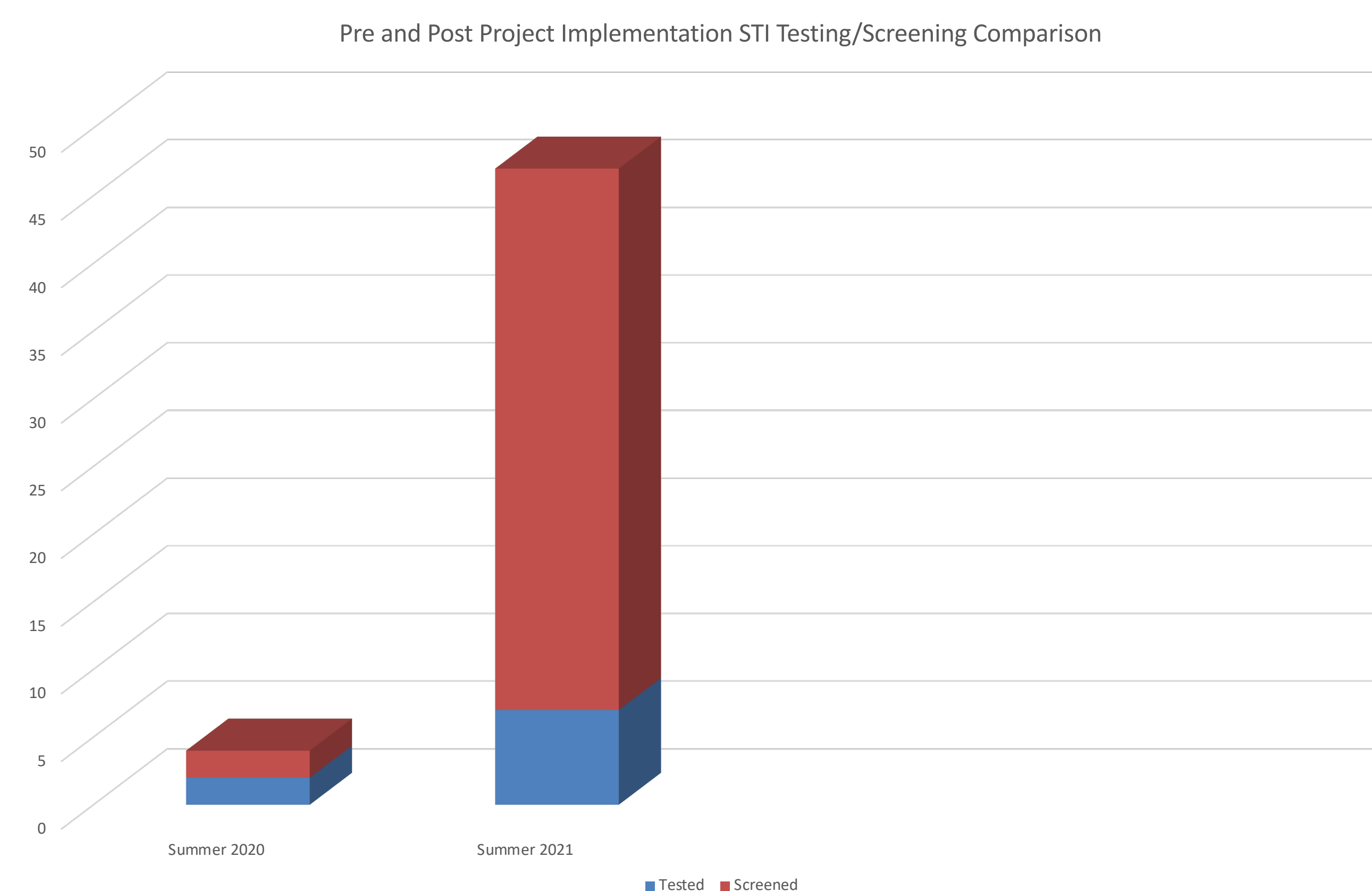
- STIs are a major problem in the adolescent population, with the greatest age group of new STIs within 15-24 years old.
- Adolescents are distinctively at a higher risk due to high-risk behaviors.
- Routine screening, education, adequate treatment, and providing partner services for individuals infected with STIs are crucial steps to decrease the disease burden in Illinois (Illinois Department of Health, 2016).
- Current evidence-based practice methods of testing per CDC/AAP/USPSTF to ensure the highest accuracy for testing when recommended.
- Barriers to testing include accessibility, confidentiality, and knowledge deficit.
- Review also included what to do in the event of test kit shortages.

## PROJECT METHODS

- Meeting with stakeholder to identify problem/need. Assessment of stakeholder interest.
- Proposal of project and objectives to stakeholder.
- Review of literature and current evidence-based guidelines.
- Design of STI screening tool.
- Design: Non-experimental quality improvement project.
- PowerPoint presentation/STI Screening Tool/Additional testing sites presented to staff prior to implementation.
- Project timeline: June 2021-August 2021.
- Pre and post surveys given to the staff to evaluate effectiveness/efficacy of project implementation.

## EVALUATION

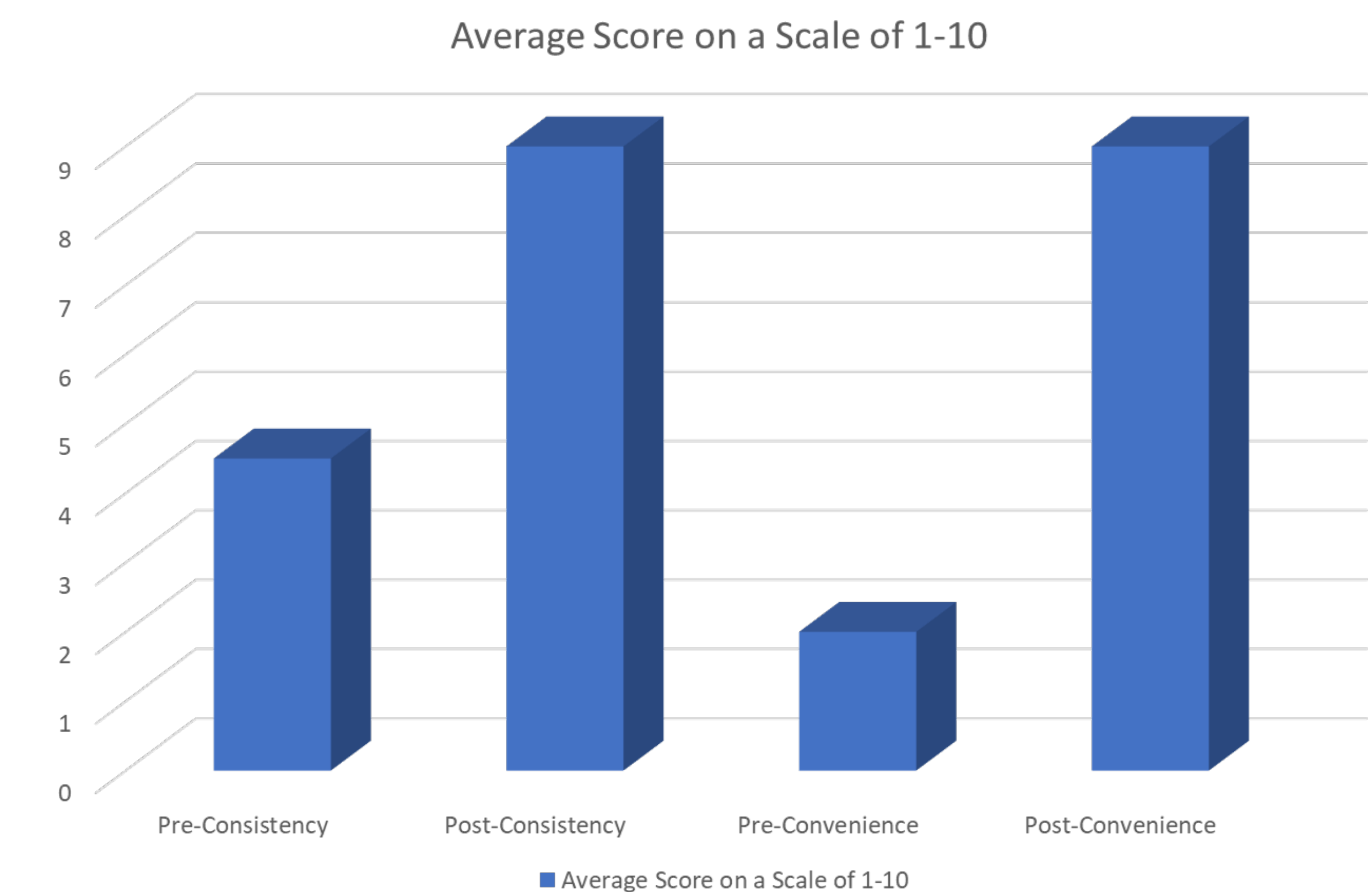
- Pre and post surveys completed by providers/staff showed a drastic increase in confidence and overall adherence to CDC STI guidelines.
- Staff felt as though this increased discussion with adolescent patients regarding sexual health per pre/post surveys.
- From Summer 2020 compared to Summer 2021 there was a 250% increase in number of patients tested who qualified per screening recommendations.



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## IMPACT ON PRACTICE

- Drastic increase in STI screening and testing rates.
- Providers and staff reported being more comfortable having STI screening conversations.
- Providers and staff were able to assist in maintaining patient confidentiality with patients via the provided alternative testing locations.
- Increased provider and staff knowledge on when to screen, test, and treat for STIs.
- New policy developed at the clinic due to our project regarding STI testing prior to starting on any form of birth control.



## CONCLUSIONS

- There are still barriers to address regarding adolescent sexual health and maintaining confidentiality/accessibility.
- Provided staff with adequate solutions to barriers regarding confidentiality.
- Increased provider knowledge of STI screening.
- Overall increase in STI screening/testing.
- Increased rapport with patients discussing sexual health and well-being.

## ACKNOWLEDGEMENTS

Special thanks to our team: Dr. Sobczak, Dr. Bogle, and Dr. Griffin, and to our stakeholders.



# Improving Depression Surveillance at the We Care Clinic

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## PROBLEM INTRODUCTION

### Depression

- One of the most common and underdiagnosed health disorders in the U.S. affecting more than 16 million people per year (Henry et al., 2020)
- Minority and low socioeconomic populations are at greater risk (Rodriguez et al., 2018)
- Quality screening practices and tools are vital in identifying patients with depression (Siu & USPSTF, 2016)
- Primary care is a suitable setting for depression screening (Ferenchick et al., 2019)

### SIUE We Care Clinic

- Primary care clinic located in East St. Louis, IL
- Serves a predominately minority, underserved patient population
- No standardized process to collect or transcribe depression screenings

### Purpose

- Improve and standardize depression surveillance at the We Care Clinic

## LITERATURE REVIEW

### Current Depression Screening Recommendations

- USPSTF (2016) recommends screening for depression in people ages 18 years and older
- Optimal timing and interval for depression screening are not known
- One strategy is to screen all patients who have not been screened before
- Another strategy is to consider patient risk factors, comorbid conditions, and life events to determine if screening is warranted (USPSTF, 2016)
- Primary care is an appropriate setting for depression screening (Siu & USPSTF, 2016)

### Benefits & Harms of Depression Screening

- Depressive symptoms reduced when screening was utilized in primary care settings (Siu & USPSTF, 2016)
- Little to no evidence of harm was associated with screening for depression (USPSTF, 2016)

### Appraisal of Screening Tools

- 2-item and 9-item Patient Health Questionnaire (PHQ-2 and PHQ-9)
- Most widespread use and highest specificity and sensitivity (Maurer et al., 2020)

### Education to Increase Depression Screening

- Interventions that integrate culturally competent care, promote staff education, and guide decision-making are possible ways to increase depression screening rates (Lee-Tauler et al., 2018; Henry et al., 2020).

## PROJECT METHODS

### Plan

- Assessment of stakeholder needs and current screening approach
- Retrospective chart review of depression screenings

### Do

- Pre- and post-implementation staff surveys
- Development of evidence-based clinic protocol for depression screening
- Educational presentation with staff
- Utilization of depression screening protocol for a period of 8 weeks

### Study

- Analysis of collected depression screenings and staff surveys

### Act

- Discuss barriers to protocol sustainability and promote future use

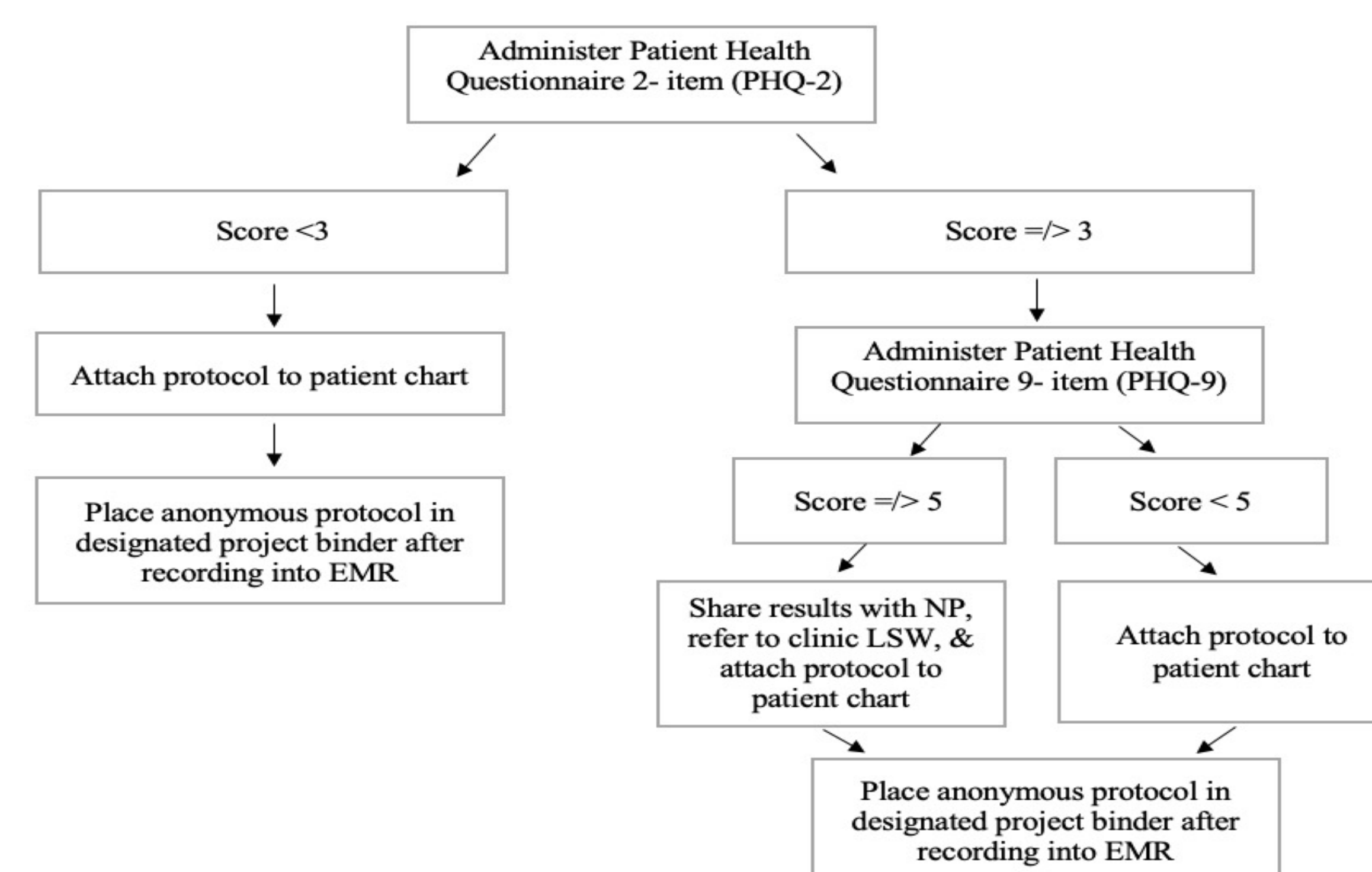
## SCREENING PROTOCOL

Patients eligible: Adults (age 18 years and older)

Who can provide screenings: MA, provider (NP, PA, MD, DO), LSW, RN

If patient meets 1 or more of criteria → Administer PHQ-2

- New patient visit
- Encounter for annual wellness visit/annual physical exam
- Non-Caucasian
- Medicare/Medicaid
- No health insurance
- Unemployed
- Personal history of depression or any other mental illness
- Reporting symptoms of depressed mood, fatigue or hopelessness



## EVALUATION

### Depression Screenings Results:

- 58 patients were screened using the protocol during the 8-week period, an increase from 26 pre-implementation screenings
- When the protocol was followed, moderate to severe depressive disorders were detected

### Staff Survey Results Demonstrated:

- The depression screening protocol clarified when patients should be screened and increased the number of patients screened
- Unanimous staff agreement for continued use of the protocol

## IMPACT ON PRACTICE

Use of the screening protocol led to an immediate increase in patients screened for depression.

Potential for improved depression surveillance in an at-risk population.

Improved staff confidence in how and when to administer a depression screening.

Potential to promote open conversation with patients with the goal of early identification, education, and intervention.

## CONCLUSION

- When provided with education and a straightforward protocol, awareness of depression and confidence in screening improved; therefore, an increase in the amount of depression screenings was observed.
- The depression screening protocol guided staff to ensure at-risk patients were screened, identified patients who met the criteria for screening, and helped reduce the number of patients with depression from going undetected.
- Continued use of protocol has the potential to enhance surveillance for early identification and intervention.

## ACKNOWLEDGEMENTS

We would like to thank Dr. Furfaro, Dr. Ampadu, and the We Care Clinic Staff for their guidance and support throughout this project!

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# Implementation of Childhood Trauma Questionnaire in a Primary Care Setting

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## PROBLEM INTRODUCTION

- Childhood abuse, neglect, and traumatic conditions are common childhood issues with most Americans having experienced one kind (CDC, 2010).
- Research suggest these adverse effects have impact into adulthood.
- Screening and early detection of underlying childhood issues will help primary care providers identify, diagnose, and properly treat patients in order to improve and maintain a better quality of life.
- The **aim** of this project is to implement the use of a brief screening tool in a primary care medical setting to assess for traumatic childhood experiences and the impact on current adulthood symptoms, complaints, and morbidities.

## LITERATURE REVIEW

### Issues and Impacts of ACEs in Adult Health

- Negative impact on health behaviors
- Increased risk of chronic co-morbidities
- Premature death

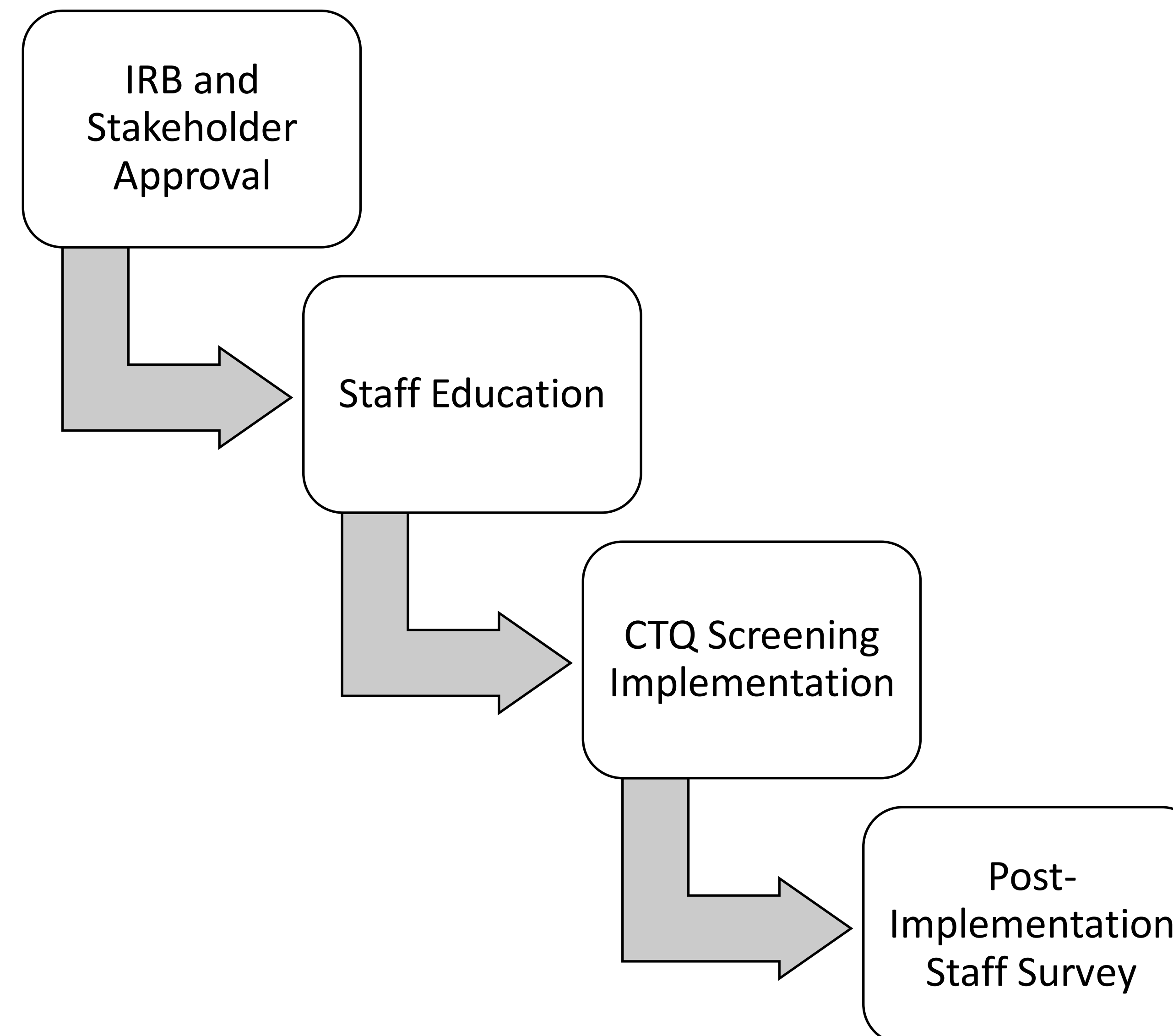
### Benefits of ACE Screening

- Early identification
- Patient specific symptom management

### Available Screening Tools

- Childhood Trauma Questionnaire (CTQ)
- Adverse Childhood Experiences (ACEs)

## PROJECT METHODS

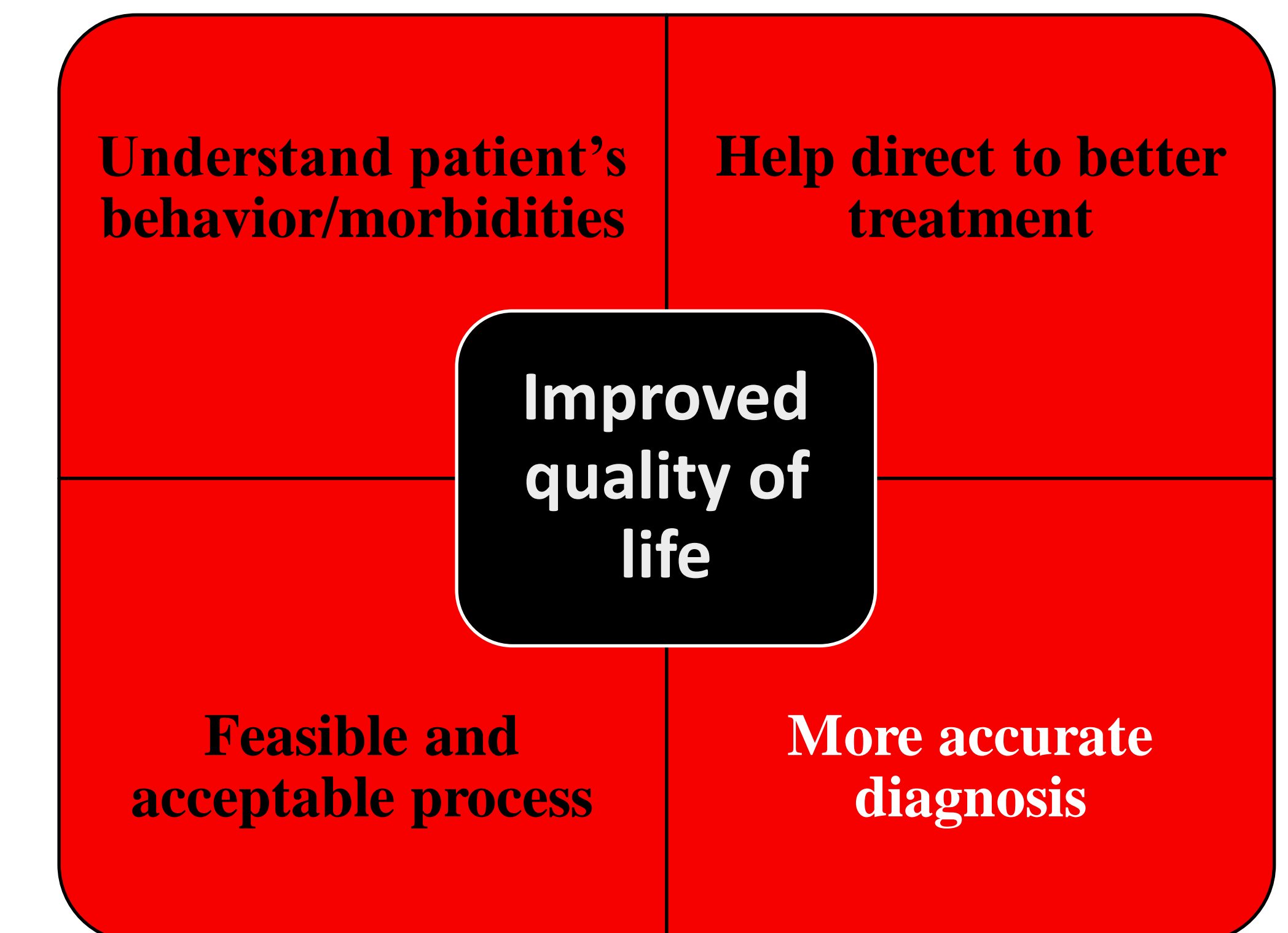


## EVALUATION

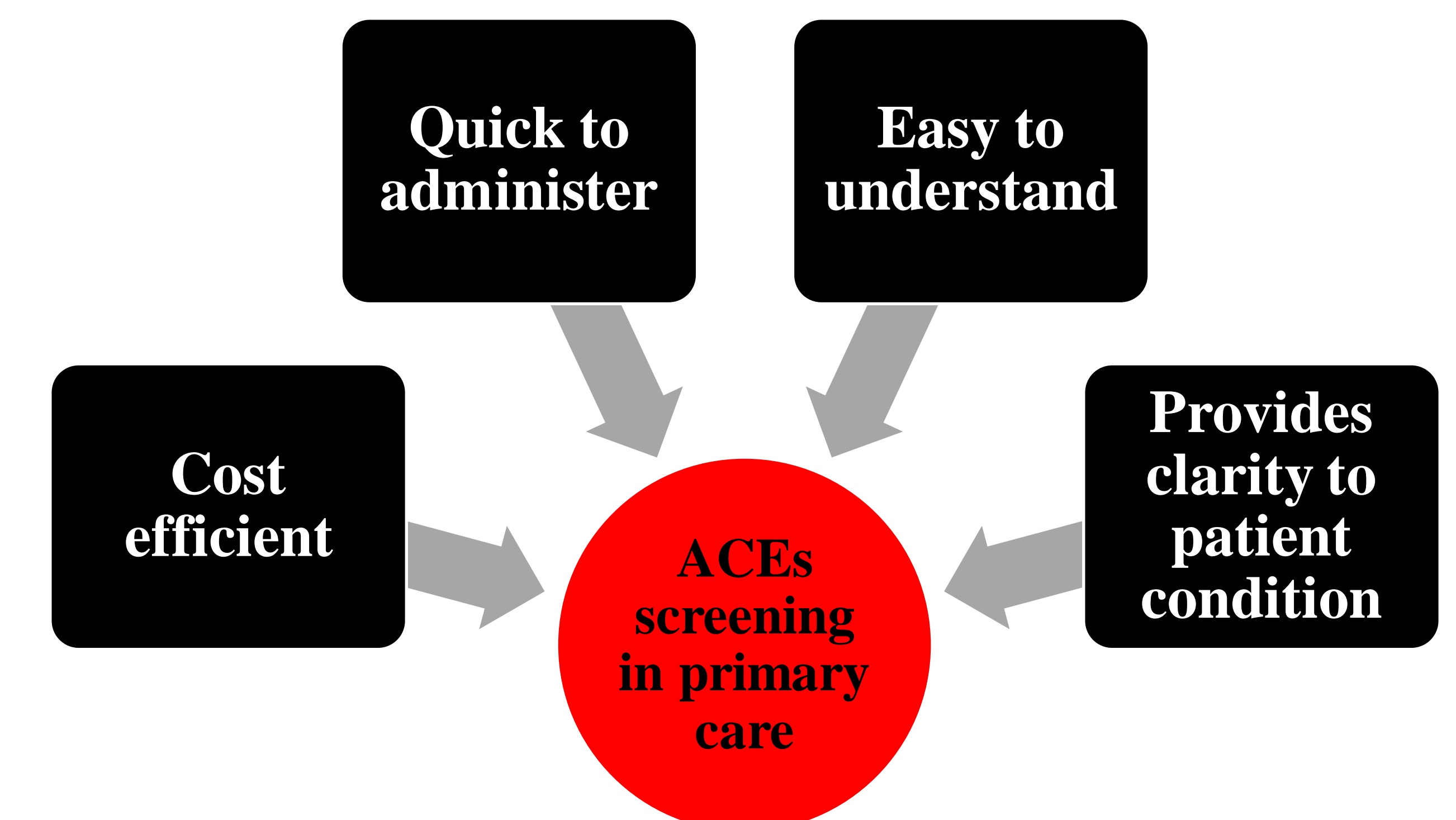
1. The CTQ was easy for me to understand?	• All staff agreed easy to understand
2. The CTQ was easy to administer to patients?	• All staff agreed easy to administer
3. The CTQ was easy for patients to understand?	• All staff stated CTQ was easy for patients to understand
4. The CTQ us a useful tool to assess patients for childhood trauma?	• All staff stated useful tool in primary care setting
5. The CTQ is a feasible tool to continue to use to assess for childhood trauma in a primary care setting?	• All staff stated easy to administer, no cost to office and beneficial for patient treatment

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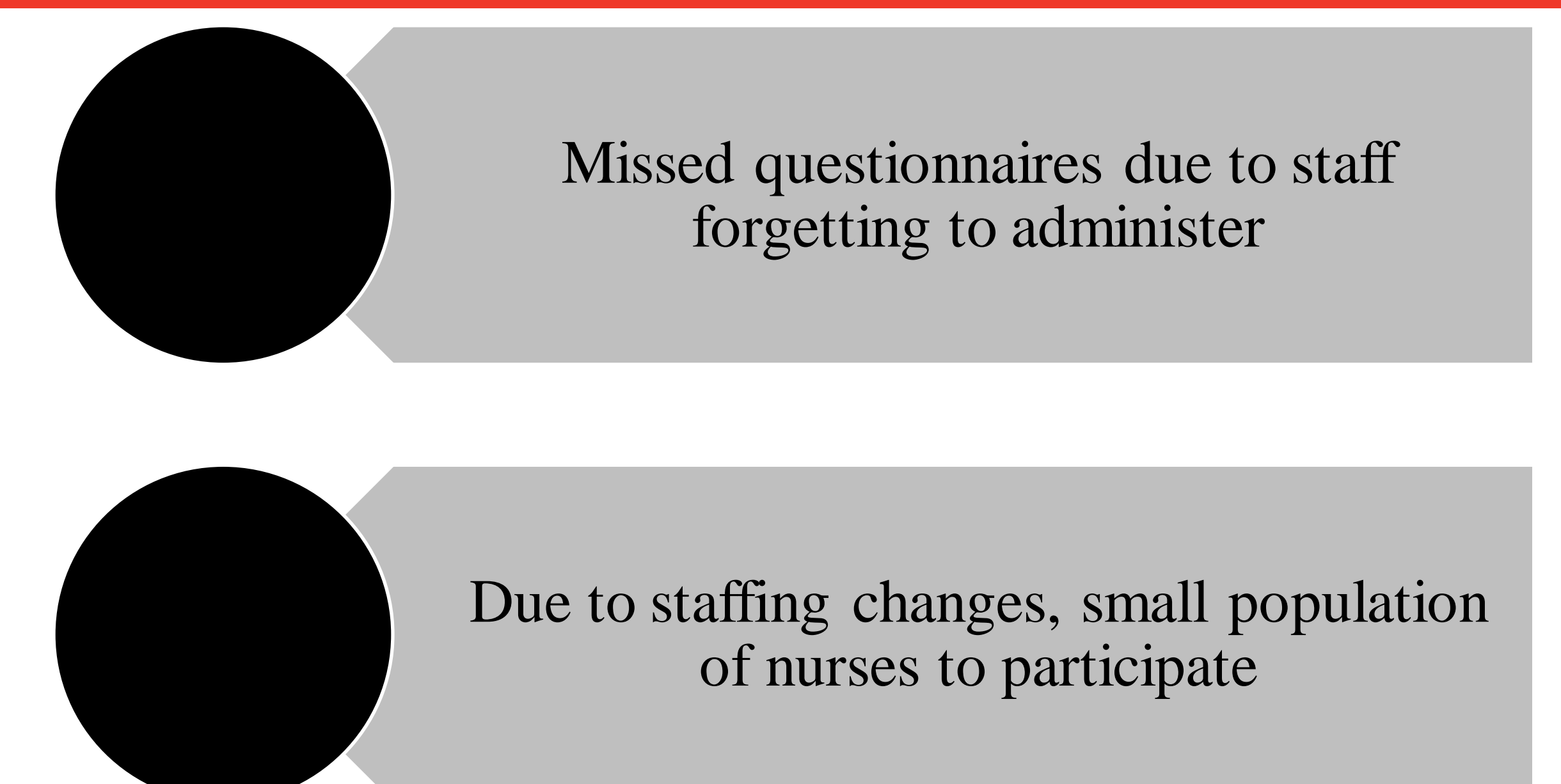
## IMPACT ON PRACTICE



## CONCLUSIONS



## LIMITATIONS





The Development of an Evidenced-Based Guideline for Intraoperative Anesthesia Management of Neuromonitoring Surgical Cases

Brent Hitchens MSN, SRNA & Darrell Risinger BSN, SRNA  
Southern Illinois University Edwardsville



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Reference List

PROBLEM INTRODUCTION

- Evoked potential (EP) monitoring is commonly utilized during neuro-spine surgical cases.
- Traditional volatile anesthesia techniques can interfere with the monitoring of somatosensory evoked potentials (SSEP) and motor evoked potentials (MEP), which alert the surgeon to potential nerve injury.
- Total intravenous anesthesia (TIVA) is the recommended anesthetic technique during EP monitoring.
- Anesthesia staff at the host facility requested an updated evidence-based guideline for anesthetic management of TIVA cases with EP monitoring.

LITERATURE REVIEW

Volatile Anesthetics

- Negatively affect EP monitoring, producing increased latency and decreased amplitude (Hasan et al., 2018)
- 0.5 MAC or less is acceptable and preserves EP monitoring quality (Taşkıran & Akyüz, 2020)

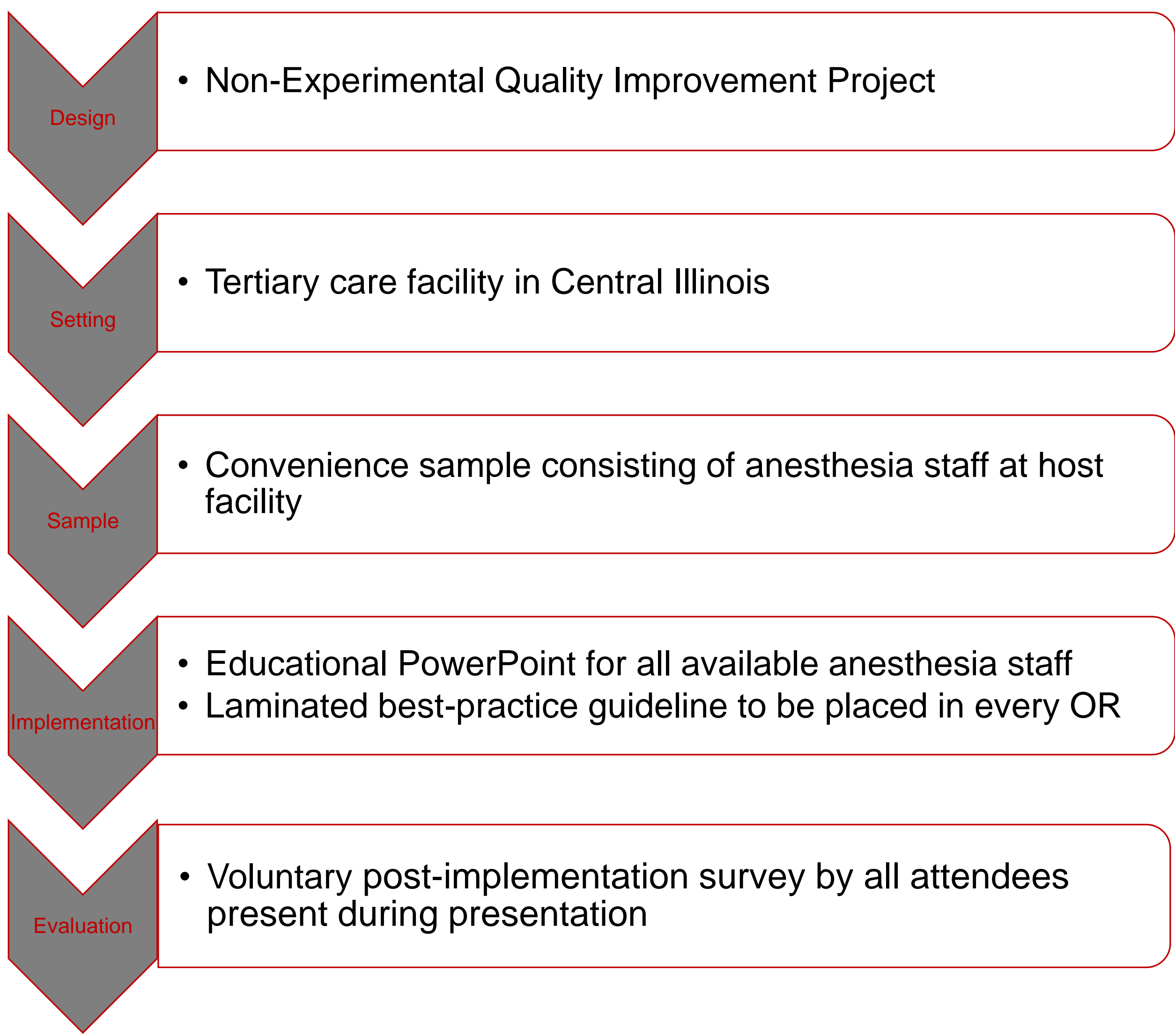
TIVA Anesthesia

- Provides favorable EP monitoring conditions when titrated and administered appropriately (Urban et al., 2017)
- Ideal TIVA protocols would include propofol with another adjunct and an opioid for pain control (Miller & Gan, 2015).

Common TIVA Medications

- Propofol: little effect on EP monitoring at therapeutic dosages. Supratherapeutic doses = minimal decrease in amplitude with a slight increase in SSEP latency (Hasan et al., 2018).
- Dexmedetomidine: minimal effect on SSEPs at therapeutic dosages. Dose dependent effect on MEPs. Infusions of 0.2-0.5 mcg/kg/hr used as an adjunct to TIVA provided optimal conditions for MEP monitoring. (Li et al., 2016).
- Ketamine: minimal to no reduction in both SSEP and MEP amplitude at therapeutic dosages. Exhibits a dose-dependent decrease in latency and increased amplitude on EP signals at supratherapeutic ranges (Santos et al., 2019).
- Opioids: the most common opioid used as an adjunct to TIVA is remifentanil. Remifentanil administered at high doses can cause depression in SSEP amplitude (Asouhidou et al., 2010).
- Lidocaine: valuable adjunct; does not significantly affect SSEPs or MEPs (Urban et al., 2017).

PROJECT METHODS



EVALUATION

- 4 CRNAs, 0 anesthesiologists attended the project implementation.
- Participants had 0-15 years of anesthesia experience.
- Participants demonstrated a high level of baseline knowledge regarding TIVA (mean 7.5 on a 1-10 Likert scale).
- Attendees agreed that the presentation increased current knowledge (mean 9.0).
- Participants felt as if the knowledge gained translated into their ability to better provide anesthesia for cases that utilize EP monitoring (mean 8.75).
- Participants agreed the presentation represented current best-practice for anesthesia management of EP monitoring cases (mean 9.75).

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IMPACT ON PRACTICE

- Anesthesia staff has easy access to an up-to-date best-practice guideline for TIVA during EP monitoring.
- Increased provider knowledge leading to potential improved patient safety, more rapid emergence from anesthesia, and overall positive outcomes.

CONCLUSIONS

- Proper dosing and administration of anesthetic agents during TIVA for EP monitoring surgical cases is imperative to ensuring positive patient outcomes.
- Overall results were positive and demonstrated that the presentation and guideline were effective tools that could aid in the facility's ability to administer optimal anesthesia for EP surgical cases.
- Limitations of the project were sample size, lack of MDA participation, and patient outcomes.

TIVA GUIDELINE

Guide for Anesthesia Management of SSEP/MEP Cases

Level 1: Same day discharge, minimally invasive, single level EBL <100 mL  
Level 2: 23 hr. admission, single level, comorbidities, EBL 100-500 mL  
Level 3: Inpatient admission, multiple levels, EBL >500 mL

Set Up	Keep OR warm: >68 Fahrenheit Fluid warmer & Bair hugger. 2-4 syringe/IV pumps. A-line (discretion/Level 2/3). Central Line/PICC (rare Level 3). BIS Monitor.	<b>Medications:</b> Ketamine bolus & infusion, Propofol bolus & infusion, Fentanyl or Sufenta bolus & infusion. Magnesium (<75 kg = 2 G) (>75 kg = 3 G), Decadron, Esmolol prn, TXA, & Albumin (Level 2/3), Lacrilube. Ofrimov for scoli cases >6 hrs. or no PO preop acetaminophen. Paralytics: Rocuronium/Succinylcholine. Consider Orphenadrine or Valium (peds), Pepcid, Reglan, Zofran. Desflurane or Sevoflurane 0.5 MAC (Discuss with EP technician).
Preeans	Blood glucose if no labs on chart or history of Diabetes Mellitus. Weight (IBW): Men 50+2.3kg for every in >5 ft. Women 45.5+2.3kg for every in >5 ft. T&S if significant EBL expected.	<b>Medications to consider:</b> Acetaminophen, Gabapentin, Celebrex, Flexeril (Level 3), Scopolamine patch, Zofran, Decadron, Emend. <b>Have antibiotics been ordered?</b> Ancef re-dose every 4 hrs, Vancomycin (if MRSA) consult pharm, Clindamycin re-dose every 6 hrs.
Intraoperative	<b>Induction:</b> Midazolam 0.2-0.3 mg/kg Propofol 1-3 mg/kg Lidocaine 1-2 mg/kg Ketamine 1-2 mg/kg (IBW) TXA 10-15 mg/kg (TBW) max 1 GM over 10 min Succinylcholine 1-1.5 mg/kg (if not contraindicated) Rocuronium 0.6-1.2 mg/kg (avoid with MEPs)  <b>Maintenance: BIS 40-60</b> Lidocaine 1-1.5 mg/kg/hr Propofol 50-150 mcg/kg/min (IBW) Titrate down as tolerated. Ketamine 0.2-0.3 mg/kg/hr (TBW) Fentanyl 1-3 mcg/kg/hr or Sufenta 0.2-0.5 mcg/kg/hr or Remifentanyl 0.05-0.2 mcg/kg/min TXA 1-2 mg/kg/hr (TBW) max 8 hrs. Stop at closure Magnesium wt. based (add to 1 <sup>st</sup> bag of IVF) Consider Ketorolac (ask surgeon) Dexmedetomidine 0.2-0.5mcg/kg/hr Inhalational agent: 0.5 MAC Desflurane or Sevoflurane (most predictable)	<b>Positioning/Intraop:</b> Prone with headrest/prone pillow. Pad as needed, frequent checks. Foley & OG (Level 2 /3), tampons (MEPs).  <b>Minimize boluses of propofol and/or adjusting Desflurane/Sevoflurane if monitoring SSEPs/MEPs.</b>  <b>Fluids/Pressors:</b> Warmed IV fluids. ABG/PPV to assess fluid status (Level2/3). <b>KEEP PPV ≤ 10.</b> 200-300 mL boluses for hypovolemia. Consider 5% albumin. <b>KEEP MAP &gt;65 titrate pressors.</b>  <b>Ventilation:</b> TV 6-8 ml/kg (IBW), PEEP 5-8, FIO2 <50%. Recruitment maneuvers as needed.
PACU	Continue maintenance fluids. Continue Dexmedetomidine 0.3-0.5 mcg/kg/hr to PICU for scoli. Neurochecks.	



# Computer-Based Learning Module: Local Anesthetic Systemic Toxicity

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## PROBLEM INTRODUCTION

- Local anesthetics (LAs) have an impressive history of efficacy and safety. (Guler et al., 2020)
- Any use of LAs carry the risk of local anesthetic systemic toxicity (LAST), a rare event that requires the collaboration of an interdisciplinary team to achieve optimal management.** (Müller et al., 2017)
- The host facility expressed the need for an updated education module regarding LAST.

## LOCAL ANESTHETIC BENEFITS

- Enhanced postoperative recovery
- Improved patient satisfaction
- Reduced opioid utilization and incidence of postoperative nausea and vomiting
- Decreased hospital length of stay
- Reduced risk of chronic postoperative pain

(Dickerson & Apfelbaum, 2014)

## LITERATURE REVIEW

Regional and neuraxial anesthesia utilizing LAs are used in a variety of settings. (Raman et al., 2019)

Awareness of LAST and its treatment are limited among healthcare providers. (Guler et al., 2020)

Incidence of LAST ranges from 0.4 to 20 in every 10,000 cases; incidence is currently on the decline. (SCJSA, 2019)

Prevention is the most effective treatment. (El-Boghdadly et al., 2018)

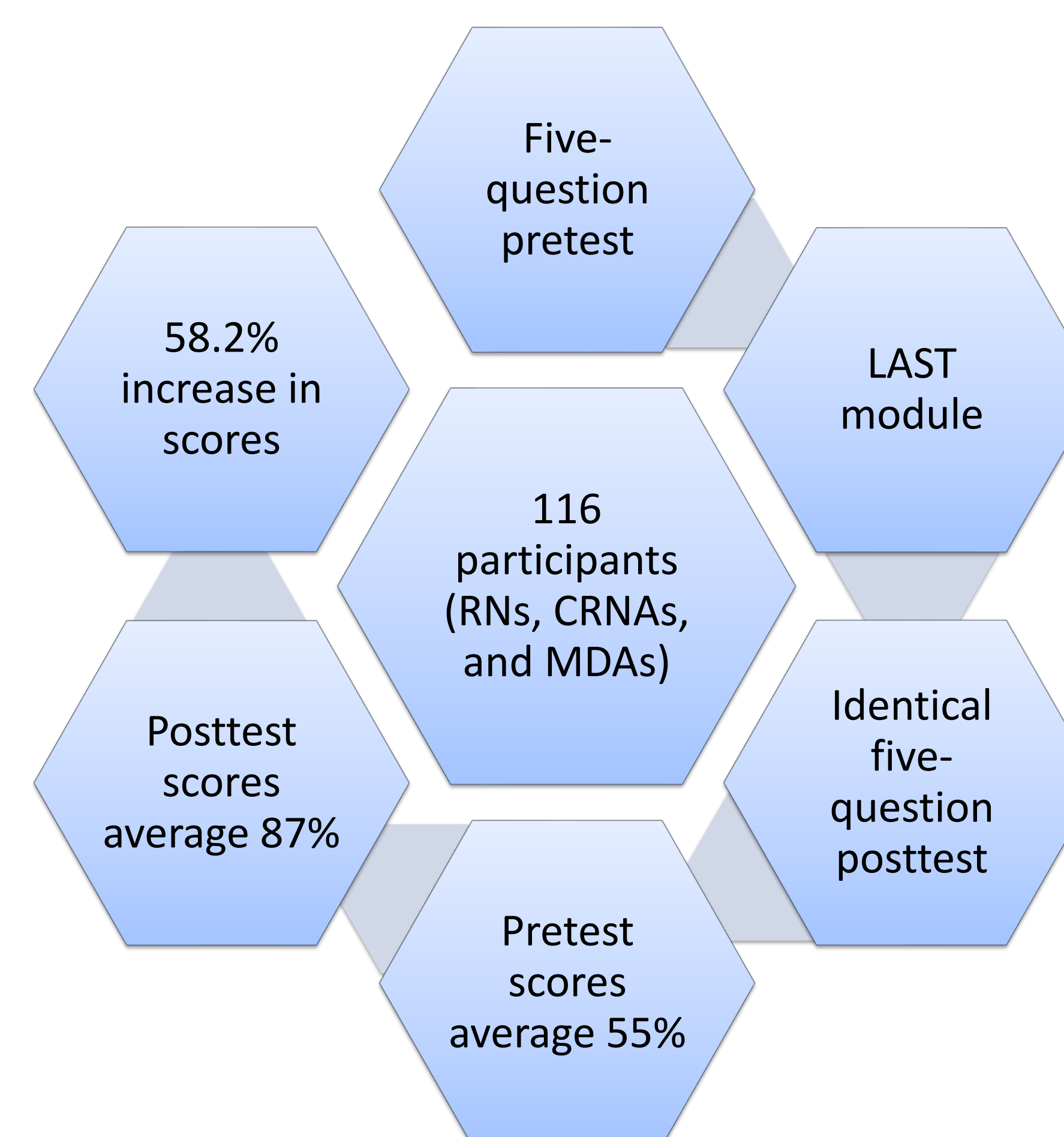
Treatments focuses on early intralipid administration, airway management, and effective CPR and ACLS. (Neal et al., 2018)

Limit the use of vasopressors in treating LAST; small doses of epinephrine 1mcg/kg are recommended. (Neal et al., 2018)

## PROJECT METHODS

- IRB and stakeholder approval obtained
- Review of literature and current evidence-based guidelines
- Development of the computer-based learning (CBL) module regarding LAST
- Implement quality improvement project by disseminating the module via HealthStream
- Convenience sample of RNs, CRNAs, and MDAs
- Collection of pretest and posttest scores from participants

## EVALUATION



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## IMPACT ON PRACTICE

Emphasize the importance of evidence-based practice on improving patient outcomes

Improvement in knowledge deficit of LAST and potentially patient outcomes

Utilizing the CBL as annual mandatory training encourages provider engagement and buy-in

## CONCLUSIONS

- Even with improvements in LA techniques, any use of LAs is associated with risks for LAST.
- Providers should be able to recognize and implement treatments as swiftly as possible.
- An increase of 58.2% in posttest scores when compared to pretest indicated an enhancement in knowledge and the potential to improve patient outcomes.**
- Further recommendations would be to offer this CBL to other facilities as a part of mandatory annual training.

## LIMITATIONS

- Lack of demographic information and data from individual test questions
- Lower number of participants compared to similar projects at the same facility
- Limited participant engagement due to online, independent-learning format

