Management of Ineffective Epidural for Cesarean Section
Miriam Ndenecho, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION
➢ Epidurals are commonly used for labor analgesia in the United States (Carvalho, 2012).
➢ Labor epidurals can fail, become inadequate, or offer suboptimal analgesia.
➢ High blocks can occur after a single-shot spinal for cesarean section following inadequate labor epidural.
➢ High or total spinal from the cranial spread of local anesthetic can result in loss of consciousness and cardiorespiratory arrest (Dadarkar et al., 2004).
➢ A best practice guideline on managing ineffective epidural for a cesarean section may reduce provider variability and adverse events, such as high spinal.

PROJECT METHODS
➢ Examine literature for best practices for managing an ineffective labor epidural for cesarean section.
➢ QI project goal was to present a guideline to OB anesthesia providers at a Level 3 Perinatal Center in central Illinois.
➢ The effectiveness of the PowerPoint presentation and feedback from the participants was measured with a survey post-implementation.

EV ALUATION
➢ 33.3% of participants stated they discontinued or resited an ineffective epidural, while 67% discontinued the epidural and performed a spinal.
➢ All participants understood the increased risk of high or total spinal after a failed epidural top-up.
➢ Following an ineffective epidural, most participants decreased the spinal dose by 20-30%.

LIMITATIONS
➢ Lack of research prohibited developing a best practice guideline for the host facility.
➢ Time constraints for the presentation
➢ Small sample size

REFERENCES

CONCLUSIONS
➢ Goal of developing a guideline was not met due to lack of research.
➢ More research on best practice management of ineffective epidurals is needed.
➢ Anesthesia providers need to weigh risks vs. benefits and customize care based on level of existing block and urgency of cesarean section.

LITERATURE REVIEW

Cues for potential failed epidural
• Frequent need for boluses
• Emergency cesarean section
• Catheter migration
• Unilateral/patchy block

Management of ineffective labor epidural for cesarean section
• Epidural catheter replacement
• Single-shot spinal
• CSE
• General anesthesia

Interventions to prevent general anesthesia
• Optimizing a pre-existing epidural
• Resiting the epidural
• Administering a spinal anesthetic
Cefazolin Administration in Penicillin Allergic Patients
Jessica Doerr, BSN, SRNA
Southern Illinois University Edwardsville

**PROBLEM INTRODUCTION**

- Surgical site infections are the most expensive hospital-acquired infection, yet over 55% are considered preventable via prophylaxis measures (Umscheid et al., 2011).
- Cefazolin, trade name Ancef, is a first-generation cephalosporin beta-lactam that is the most common recommended first line SSI prophylaxis antimicrobial (Bratzler et al., 2013).
- Cefazolin administration to patients with a reported penicillin allergy varies among anesthesia providers due to concerns of potential cross-reactivity thus allergic reactions.
- The purpose of this project was to review the literature and create an evidence-based algorithm to guide anesthesia providers on cefazolin administration.

**LITERATURE REVIEW**

- The evolution of perioperative antimicrobial prophylaxis in surgery.
- The Surgical Care Improvement Project.
- Prevention and incidence of SSIs.
- Perioperative anaphylaxis.
- Types of allergic reactions and immune responses.
- Circulating antimicrobial resistance.
- The cefazolin administration algorithm was positively supported and easy to follow and understand.

**PROJECT METHODS**

- Identified problem
- Proposed project and objectives to stakeholder
- Conducted a review of the current evidence-based literature
- Created a Cefazolin Administration Algorithm for anesthesia providers
- Educational presentation and algorithm introduction for anesthesia and pharmacy staff members
- Participants evaluated project via anonymous post presentation survey

**IMPACT ON PRACTICE**

- Immediate
  - Creation and presentation of an evidence-based pilot algorithm
- Predicted Long-Term
  - Dissemination of the algorithm to all operating rooms
  - Creation of a protocol using the algorithm

**EVALUATION**

- Six staff members completed the post presentation survey (4 CRNAs 2 pharmacists).
- Analysis concluded that 67% of the participants correctly identified all five knowledge assessment questions.
- A mean score of 4.5/5 suggested the algorithm was easy to understand and follow.
- A mean score of 4.8/5 suggested participants were likely to support algorithm implementation.
- Anticipated barriers identified included provider hesitance and surgeon buy-in.

**CONCLUSIONS**

- SSIs are preventable hospital-acquired infections, particularly with optimal surgical antimicrobial administration (Umscheid et al., 2011).
- Cefazolin is safe to administer to a majority of patient’s reporting a penicillin allergy.
- The cefazolin administration algorithm was positively supported and easy to follow and understand.
- Future anesthesia and pharmacy collaboration projects may result in facility-specific enhanced surgical patient outcomes.

**PILOT ALGORITHM**

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE
School of Nursing
Tranexamic Acid Protocol for Lower Extremity Joint Arthroplasty

Autumn Cullison, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

- About 7 million Americans were living with an artificial hip or knee in 2010 (Maradit Kremers et al., 2020).
- Total hip or knee arthroplasty are projected to become the most common elective surgeries within the United States (Maradit Kremers et al., 2020).
- Bleeding is a risk associated with surgery, and complications, such as hypotension, anemia, and decreased oxygen-carrying capacity may occur as a result (Sahu et al., 2014).
- Blood transfusions have been the mainstay treatment for excessive surgical blood loss; however, transfusion has associated risks, including infection, volume overload, immunological reactions, and increased morbidity and mortality (Zhang et al., 2020).
- Tranexamic acid (TXA) is an antifibrinolytic medication commonly used in orthopedic surgery to decrease surgical blood loss (Gausden et al., 2017; McCormack, 2012).
- While TXA has been in use for years, there has been a lack of consensus within the literature and practice regarding contraindications and dosing guidelines, leading to high provider variance in administration.

LITERATURE REVIEW

Absolute Contraindications
- Acute subarachnoid hemorrhage
- Coronary or vascular stent within the previous six months to one year
- Myocardial infarction within one year
- Active thromboembolic disorder
- Current uncontrolled seizure disorder
- Active consumptive coagulopathy disorder
- Renal failure

Relative Contraindications
- History of thromboembolic disorder
- History of uncontrolled seizure disorder
- Chronic renal insufficiency
- Dose reduction recommended based on serum creatine

Dosing Guidelines
- 20 mg/kg IV TXA prior to incision, max of 2.5 g
- Repeat if surgery time >2 hours
- BMI >30: 10 mg/kg prior to incision, repeat dose at close
- Dose reduction for renal insufficiency: o 2.82 or less – 10 mg/kg Q12H
  o 2.82 to 5.65 – 10 mg/kg Qday
  o >5.65 – 5 mg/kg Qday

References:
- Autumn Cullison, BSN, SRNA
  Southern Illinois University Edwardsville
  PROJECT METHODS
  - Key stakeholder interest assessed for QI project
  - Literature Review
  - Protocol development
  - IRB approval obtained
  - Implementation via in-person or virtual presentation
  - Feedback via anonymous paper or Qualtrics survey

EVALUATION

- 9 anesthesia providers and 1 SRNA attended & completed the paper survey.
- 1 provider participated virtually & completed the Qualtrics survey.
- A 5 point Likert scale was utilized to assess staff support of the protocol.
- All respondents agreed the protocol would be beneficial for the facility.
- 91% indicated agreement or strong agreement with adopting the protocol into practice, while the remaining 9% indicated they were neutral.

CONCLUSIONS

- TXA protocol may decrease facility and patient costs.
- Participants supported protocol adoption.
- No barriers to implementation identified.
- May serve as a catalyst for future TXA protocols for other surgeries.
- Potential follow-up: survey & chart review assessing protocol utilization & patient outcomes to promote long-term practice change.
Implementation of a GlideScope Education Program for Novice Student Registered Nurse Anesthesiologists

Brian Bendel, BSN, SRNA
Joshua Snodgrass, BSN, SRNA
Southern Illinois University Edwardsville

Problem Introduction

- Southern Illinois University at Edwardsville's (SIUE) Doctorate of Nurse Anesthesiology program lacked education addressing GlideScope video laryngoscopy (VL).
- VL has become a popular method for securing the difficult airway when direct laryngoscopy (DL) has failed (Chemsian et al., 2014).
- GlideScope VL has unique risks related to a known blind spot (Greer et al., 2017).
- Injuries resulting from nonvisualized trauma caused by the GlideScope may require intervention ranging from extended monitoring to surgical intervention (Greer et al., 2017).

Project Methods

- This project was a non-experimental quality improvement pre-test/ post-test design.
- 1st-year SRNAs received a pre-test prior to any educational intervention.
- Following the pre-test GlideScope VL didactic education via Powerpoint was provided one week prior to low fidelity simulation utilizing the GlideScope video laryngoscope for airway management.
- Students utilized the knowledge gained from didactic to perform endotracheal intubation utilizing the Verathon 4 step method on airway training manikins.
- Each student then completed a post-test with identical knowledge-based questions to the pre-test.
- Results were compiled and compared to judge the efficacy of our educational intervention.

Evaluation

- 31 SRNAs completed the pretest.
- 32 SRNAs completed the post-test.
- The 30% increase in post-test mean score was indicative of knowledge gained.
- Confidence levels with GlideScope VL improved significantly.

Impact On Practice

- Overall knowledge regarding GlideScope VL technique, indications for use, and potential injuries increased, as well as operator confidence.
- The short-term impact aimed to increase novice SRNA’s confidence and knowledge related to GlideScope VL.
- The long-term impact aims to decrease injuries related to GlideScope through increased confidence and operator awareness of injury risk.

Conclusions

- GlideScope VL education and simulation before entering the clinical setting had a positive impact on novice SRNAs.
- GlideScope education and simulation helped SRNAs identify airway anatomy, associated risks for airway injury, perform GlideScope technique, and improved novice SRNA’s confidence.
- Continued education and hands-on skills simulation with GlideScope VL may improve patient safety and long-term outcomes related to GlideScope VL for airway management.
- Outcomes from this project support inclusion in SIUE’s Doctorate of Nurse Anesthesiology program.

References
**PROBLEM INTRODUCTION**

**Airway Management and Anesthesia**
- Certified Registered Nurse Anesthesiologists (CRNAs) can utilize Point-of-Care Ultrasound (POCUS) airway assessments to illuminate crucial information about a patient's airway anatomy and decrease devastating consequences of airway mismanagement such as neurological damage and death.

**AANA and ASA Recommendations on POCUS**
- The American Association of Nurse Anesthesiologists (AANA) and the American Society of Anesthesiologists (ASA) have released recommendations that anesthesia providers become proficient in using POCUS for standard diagnostic requirements, including airway assessment.

**Nurse Anesthesia Program Airway POCUS Curriculum**
- The current host Nurse Anesthesia Program lacks a distinct POCUS-centered curriculum for airway examination.

**LITERATURE REVIEW**

**Endotracheal Tube (ETT) Placement Confirmation**
- Ultrasound can discriminate between tracheal versus esophageal intubation and has superior sensitivity and specificity compared to auscultation in detecting endobronchial intubation.

**Difficult Laryngoscopy (DL) and Difficult Airway Predictors**
- POCUS measurements and identification of various airway anatomical landmarks can predict DL and may have greater prediction of difficult airways compared with traditional physical assessment.

**Cricothyroid Membrane (CTM) Identification**
- Difficult airway anatomy and ambiguous anatomical landmarks prevent correct identification of the CTM through palpation, and POCUS allowed significantly increased success in CTM identification.

**Ultrasound Performance Time**
- Ultrasound is faster at confirming ETT placement compared to capnography with assistance and equal to capnography alone.
- On average, it takes 30-48 seconds to find the vocal cords and identify the CTM with POCUS.

**Peer Teaching in Ultrasound Education**
- Peer instruction was found to be as effective as staff-led teaching and has a positive interrelationship between peer teaching, student feedback, and improved knowledge in ultrasound examination.

**PROJECT METHODS**

**Design**
- PowerPoint presentation with voiceover lecture detailing basics of ultrasonography and the airway POCUS examination.
- One-hour hands-on skill development lab on SIUE campus.
- Second PowerPoint lecture reviewing endotracheal versus esophageal intubation.

**Goals**
- Create an airway POCUS examination curriculum based on most recent evidence for its application in anesthesia practice.
- Increase understanding of airway POCUS examination techniques and benefits.
- Encourage airway POCUS use in anesthesia practice for improved patient care.

**Execution**
- 11-question pre-lab survey to evaluate prior knowledge of airway POCUS assessment.
- PowerPoint lecture and skills development lab including a demonstration of the airway POCUS examination with proper equipment, positioning, techniques, and measurements on a volunteer.
- 11-question post-lab survey to assess effectiveness of curriculum.

**IMPACT ON PRACTICE**

**POCUS allows quick ETT placement confirmation without reduced diagnostic accuracy, especially in cases with no waveform capnography**
- POCUS techniques expand anesthesia practice and provide a tool to keep CRNAs up to date on evidence-based evaluation techniques.

**CONCLUSIONS**

**Incorporation of a comprehensive airway POCUS curriculum into a Nurse Anesthesia program**
- Improves patient safety and outcomes.

**Mastery of airway ultrasound assessment with minimal training and peer-led instruction**
- Enhancing students' knowledge of airway anatomy, predictors of DL, identification of the CTM, and assessment of ETT positioning.

**EVALUATION**

- The Nurse Anesthesia students' confidence levels in performing essential airway POCUS assessment skills improved in every category.
**Adjuncts and Additives to Regional Anesthetics**

Kaisi Dye, BSN, SRNA  
Kelcie Brunnert, BSN, SRNA  
Southern Illinois University Edwardsville

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**PROBLEM INTRODUCTION**

- Peripheral nerve blocks have been proven to be extremely beneficial part of anesthetic care.
- Nerve blockade can reduce the amount of both anesthetic gases and opioids, as well as increase patient satisfaction.
- Our project and research are aimed at establishing clear recommendations for additive agents to local anesthetics for shoulder, breast, and knee surgeries.

**LITERATURE REVIEW**

- Magnesium, Epinephrine, Dexamethasone, Sodium Bicarbonate, and Dexmedetomidine are commonly added to nerve blocks for shoulder, breast, and knee procedures.
- Epinephrine can increase the duration of a given local anesthetic two to three times therefore decreasing the amount of local anesthetic needed in turn lowering the risk of LAST but is not very effective in the longer acting local anesthetics as it wears off before they do (Krishna et al., 2020).
- Magnesium is cost-effective, readily dissolvable in local anesthetics, easy to store, and is very effective in prolonging nerve blockade. However, it has shown increased incidence of postoperative nausea and vomiting (Swain et al., 2017).
- Dexamethasone can also substantially prolong sensory blockade in peripheral nerve blocks, although it also increases motor blockade duration which can be detrimental for patients who have had a surgery that necessitates early postoperative mobility (Krishna et al., 2020).
- Sodium bicarbonate has been found to speed onset of both motor and sensory blockade when added to local anesthetics for peripheral nerve blocks, however, it has shown no efficacy in prolongation of the block (Bailard et al., 2014).
- Dexmedetomidine has been shown to be a preferable choice as a local anesthetic additive. It prolongs blockade and is particularly useful in upper extremity nerve blocks (Vorobeichik et al., 2017). Although, while still useful in prolonging pain relief in lower extremity blocks, it may also prolong motor blockade which could result in increased risk for falls and a longer amount of time before postoperative therapy can be initiated.

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**PROJECT METHODS**

- Our project was implemented at a rural community hospital setting in Jacksonville Illinois.
- The project was not aimed at the technical aspects of the block, but rather the agents used and their appropriateness for the type and length of surgery specified.
- A pre-test was given to assess baseline knowledge before our presentation. Upon completion, the respondents were given a post-test to assess knowledge gained.

**EVALUATION**

- This project was very easy to implement as we were able to meet with providers and perform in-person educational sessions.
- Very few providers were able to attend these in-person sessions due to staffing the day of implementation.
- Majority of the providers we were unable to come into contact with did complete and return the surveys. However, we were unavailable for immediate question or discussion. We did leave contact information for them to reach out but never received any correspondence after implementation day.
- The providers that we were able to speak with were able to ask questions and we were able to discuss and gauge their willingness to change future practice based on the information provided to them.

<table>
<thead>
<tr>
<th>Always</th>
<th>Often</th>
<th>Never/Seldom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Adjuncts</td>
<td>55%</td>
<td>33%</td>
</tr>
<tr>
<td>Use of Epinephrine</td>
<td>55%</td>
<td>33%</td>
</tr>
<tr>
<td>Use of Magnesium</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Use of Bicarbonate</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Use of Dexamethasone</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>Use of Dexametomidine</td>
<td>55%</td>
<td>33%</td>
</tr>
</tbody>
</table>

**IMPACT ON PRACTICE**

- Improved knowledge of effective adjunctive medications to peripheral nerve blocks as well as preferred blocks for knee, breast, and shoulder surgeries.
- Increased awareness of side effects of additives to peripheral nerve blocks, most specifically Dexmedetomidine.
- Expressed interest and open-mindedness to different additives in the provider’s daily practice.
- Utilization of adductor canal blockade over femoral nerve blockade to decrease likelihood of postoperative complications.

**CONCLUSIONS**

Recommendations for further research include:

- Epinephrine, dexamethasone, sodium bicarbonate, and dexmedetomidine in combination with local anesthetics for pectoralis major (PEC) block
- Magnesium, epinephrine, and sodium bicarbonate as additives to local anesthetics for adductor canal blockade

Due to a small sample size and lack of post-test data from nearly half (44.4%) of the participants, the results of the post-test and efficacy of the training may not be applicable to larger populations.

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**REFERENCES**
Improving Student Registered Nurse Anesthesiologists’ Skills and Confidence Through High-fidelity Simulation

Daniel McGee, BSN, SRNA & Robert Stein, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

- Safe practice and optimal patient outcomes remain consistent goals in anesthesia care.
- High-fidelity simulation exposes providers to various clinical situations, builds foundational skillsets, and enhances provider proficiency while removing the risk for patient harm.
- The intended outcome for this project was to expose Student Registered Nurse Anesthesiologists (SRNA) to full scenarios of commonly encountered anesthesia situations to develop the participants’ workflow, technical skills, troubleshooting, and critical thinking abilities.

PROJECT METHODS

- This project aimed to improve SRNA competence and confidence with the standard anesthesia induction sequence and complications, specifically esophageal or right mainstem bronchus intubations.
- All SRNAs enrolled in the SIUE Orientation to Nurse Anesthesia Practicum participated in the simulation as part of their laboratory experience.
- Students who volunteered to participate did so by completing a pre and post-test.
- The class was divided into groups of four students. Two students in the group completed the esophageal intubation simulation while the other two completed the right mainstem intubation simulation.
- One student in the simulation managed the airway while the other student administered medications.
- After the simulation, both groups debriefed together.

IMPACT ON PRACTICE

- An esophageal intubation may lead to life-threatening hypoxemia. Simulating an esophageal intubation may prepare student registered nurse anesthetists to promptly recognize and treat this complication in the clinical setting.
- A right mainstem intubation, if not promptly recognized and treated, may lead to hypoxemia, pneumothorax, and death. Student registered nurse anesthetists who have simulated a right mainstem intubation may be better prepared to intervene if presented with this complication in the operative arena.
- The results of this DNP project suggest that the simulation led to an increased perception of confidence and competence in managing potential complications of an anesthetic induction.

LITERATURE REVIEW

- Recent literature demonstrates that problem-based learning improves student satisfaction and demonstrates greater gains in knowledge when compared to traditional techniques (Shin & Kim, 2013).
- Scenario-based simulation is frequently utilized in anesthesia-related training and allows for variations in patient acuity and conditions (Bevil et al., 2020; Crowe et al., 2018; Disher et al., 2014; Flynn et al., 2017; Staun et al., 2020).
- The debriefing piece of a high-fidelity simulation holds great value in a student’s educational experience and increases the effectiveness of high-fidelity simulation by 25% (Tannenbaum & Cerasoli, 2012).

EVALUATION

- Students completed an 11-question pre-test and 14-question post-test utilizing open-ended, yes/no, and 5-point Likert-type questions.
- The students’ pre and post-test metrics of confidence and competence were evaluated to identify the efficacy of the simulation and debriefing.
- Students self-reported background nursing/simulation experience and their confidence and competence with the anesthesia induction sequence, executing endotracheal intubation, confirming the placement of an endotracheal tube, and troubleshooting the potential complications of endotracheal intubation.

CONCLUSIONS

- In the perioperative area, complications demand a rapid diagnosis and treatment to minimize patient harm.
- The improvements in confidence and competence that SRNAs report after the high-fidelity simulation, in conjunction with the added anesthesia experiences, will better prepare SRNAs to provide safe anesthesia care and mitigate complications, should they arise.
Postdural Puncture Headaches and the Development of a Treatment Protocol

Matthew Gill, BSN, SRNA
Southern Illinois University Edwardsville

PROBLEM INTRODUCTION

- This project was used to educate anesthesia staff at a community hospital in the St. Louis metro-west region on the most up to treatment options for PDPH as well as to provide an evidence-based treatment algorithm that could be implemented into practice at the host facility.

PROJECT METHODS

- Meet with stakeholder to identify problem/need
- Develop an educational presentation and PDPH treatment protocol
- Educate staff on most up to date information on PDPH
- Evaluation of project via anonymous pre and post education questionnaires

IMPACT ON PRACTICE

- Anesthesia staff reported a strong likelihood of implementing the PDPH treatment protocol into their practice.
- Long term impact could positively influence the birthing experience for parturients visiting the host facility

CONCLUSIONS

- After comparing results from the pre and post education questionnaires, it appears the educational presentation was effective as questionnaire scores showed improvement following the educational presentation.
- All staff either strongly agreed (85.7%) or agreed (14.3%) that they would implement the proposed protocol into their practice.

PROPOSED TREATMENT PROTOCOL

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct Pre-Education</th>
<th>Correct Post EPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A post dural puncture headache (PDPH) typically presents within 48 hours after a meningeal puncture.</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Head or neck pain worsens within 15 minutes of sitting/standing &amp; relief within 30 minutes of lying flat.</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Associated symptoms include:</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Dull, throbbing, bilateral, orthostatic, nausea</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Bedrest, euvolemia, caffeine, antiemetics, &amp; analgesics</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>An EBP should be reserved for those patients with severe symptoms due to associated risks such as back pain, additional PDPH, spinal hematoma, and meningitis.</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>An EBP is contraindicated in patients with a history of 2 or more severe dural punctures.</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>After the blood patch, position the patient supine for 2 hours.</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Risk factors for PDPH:</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Decreased Age, Female Sex, Headache History, Pregnancy, BMI &lt;31.5, &amp; Non-smoking</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
<tr>
<td>Decreased Age, Female Sex, Headache History, Pregnancy, BMI &lt;31.5, &amp; Non-smoking</td>
<td>True</td>
<td>7/7 (100%)</td>
</tr>
</tbody>
</table>

EDWARDSVILLE SOUTHERN ILLINOIS UNIVERSITY SCHOOL OF NURSING

REFERENCES

[1] Simic et al., 2015
[5] Quincke

LITERATURE REVIEW

- Postdural Puncture Headaches and the Development of a Treatment Protocol

PATHOPHYSIOLOGY

- Peri-Kelli Doctrine
- CSF Leak

PRESENTATION

- Before ADP: Epidural Avoid ADP
- Mitigate Modifiable Risk Factors
- After ADP: Epidural Blood Patch

RISK FACTORS

- Patients: Decreased Age, Female Sex, Headache History, Pregnancy, BMI <31.5, & Non-smoking
- Procedure: Increased Needle Size, Cutting Spinal Needle, Repeat Puncures, & Bevel Perpendicular to Meningeal Fibers

PROBLEM INTRODUCTION

- Postdural Puncture Headache (PDPH) Diagnosis & Treatment Algorithm
- PDPH Diagnosis & Symptom Development
- PDPH Treatment Protocol

EVALUATION

- Evaluation of project via anonymous pre and post education questionnaires

IMPROVEMENTS

- Anesthesia staff reported a strong likelihood of implementing the PDPH treatment protocol into their practice.
- Long term impact could positively influence the birthing experience for parturients visiting the host facility

CONCLUSIONS

- After comparing results from the pre and post education questionnaires, it appears the educational presentation was effective as questionnaire scores showed improvement following the educational presentation.
- All staff either strongly agreed (85.7%) or agreed (14.3%) that they would implement the proposed protocol into their practice.
A Comparison of Erector Spinae Plane Block and Epidural Analgesia for Major Abdominal Surgery

Charles Serrano, BSN, RN, SRNA
Southern Illinois University Edwardsville

LITERATURE REVIEW

- The ESP block and epidural can provide excellent pain control for abdominal procedures such as exploratory laparotomy, open and laparoscopic nephrectomy, percutaneous nephrolithotomy, hysterectomy, gastric bypass, gastrectomy, cesarean delivery, renal transplant, and laparoscopic cholecystectomy (Chiu et al., 2017; Collins & Ebnitz, 2019; Jain et al., 2018; Kot et al., 2019; Luís-Navarro et al., 2018; Tulgar et al., 2018).
- ESP block is performed by depositing a local anesthetic between the tip of the transverse process and the fascial band of the erector spinous muscle column and relies on the cephalocaudal spread of local anesthetic to anesthetize spinal nerves within the paravertebral and epidural spaces (Adhikary et al., 2018).
- ESP block is performed using 20-30 mL of 0.25-0.5% bupivacaine or 20-30 mL of 0.2-0.5% ropivacaine while adding 4-10 mg of Decadron can extend the duration by 50-75% (Adhikary et al., 2018; Schwartzmann et al., 2018; Yang et al., 2018).
- Epidural provides visceral and somatic analgesia through the action of local anesthetic on the nerve roots in the epidural space before they exit the intervertebral foramina on both sides of the vertebral canal (Toledano & Van de Velde, 2016).
- Epidural offers superior analgesic qualities compared to the ESP block, but neuraxial anesthesia is associated with far more potential complications compared to ESP block (Adhikary et al., 2018b; Kakejko et al., 2021; Sakar et al., 2020).

EVALUATION

- Seven Anesthesia providers participated in data collection.
- Participants demonstrated a higher average score on 14 of the 20 questions on the posttest compared to the pretest. All participants responded correctly to 4 of the questions on both the pretest and the posttest while only one question yielded the same percentage of correct responses, and one question yielded a lower score on the posttest compared to the pretest.
- The mean for the pretest was 65% while the mean for the posttest was 86%.
- A paired-samples t-test was performed using a statistical software application and yielded a two-tailed P value of 0.0002 meaning that the posttest scores showed an extremely statistically significant improvement compared to the pretest scores.
- The educational seminar was an effective teaching method for the anesthesia providers in attendance and it would also be an effective training strategy for a different group of participants.

IMPROVE ON PRACTICE

- The main objective of this project was to help anesthesia personnel at the host facility gain a deeper understanding of ESP block and epidural analgesia.
- Anesthesia providers will have a myriad of opportunities to integrate the knowledge they gained during the educational seminar into their clinical practice as abdominal surgeries are common procedures.
- This project indirectly served to improve patient care and satisfaction while reducing surgical complications and opioid consumption owing to the vast dynamic range of the ESP block and epidural.
- A potential limitation of this project was that not all anesthesia providers in attendance participated in data collection.

CONCLUSIONS

- The literature shows that the epidural remains the gold standard for pain control following major abdominal surgery, but the ESP block can be an effective substitute for patients where an epidural is contraindicated or objectionable.
- The ESP block appears to have far fewer complications compared to an epidural, but the safety profile of both therapies depends on attentive monitoring and management.
- Constructivism was an effective pedagogical approach for this project.
- This project gave anesthesia providers the information necessary for them to make clinical judgments that are in the best interest of their patients thus improving patient care, safety, and satisfaction.

PROBLEM INTRODUCTION

- A large tertiary care center in central Illinois saw an increase in erector spinous plane (ESP) block administration for abdominal surgery patients, but many anesthesia providers at the facility were not acquainted with the ESP block.
- This project aimed to develop a comprehensive educational program concerning the ESP block compared to thoracic epidural analgesia for major abdominal surgery patients consequently enhancing patient recovery after surgery.
- Thoracic epidural analgesia has traditionally been the best adjunctive therapy for patients undergoing major abdominal surgery, but ESP block is a novel regional nerve block that may serve as a viable alternative (Du et al., 2020; Forero et al., 2016; Kot et al., 2019).
- Peripheral nerve blocks are associated with lower postoperative pain scores, physical stress response to surgery, postoperative opioid consumption, general anesthesia requirements, and postoperative nausea and vomiting (Madison & Ilfeld, 2013; Thompson, 2018; Tsui & Rosequist, 2017).

PROJECT METHODS

- This project was proposed to the Institutional Review Board at Southern Illinois University Edwardsville and received an exempt status as it is a quality improvement project and did not involve human test subjects.
- Using constructivism as a pedagogical approach, A robust educational program was presented to anesthesia providers at the tertiary regional care center focusing on the evidence-based research concerning the analgesic efficacy of ESP block compared to epidural for major abdominal surgery patients.
- The program introduced the relevant anatomy, indications, technique, advantages, and disadvantages of ESP block and epidural. Anesthesia providers were informed of the current supporting and opposing literature concerning the effectiveness of ESP block compared to epidural analgesia for abdominal surgeries as well as the risks, benefits, and costs of both adjunctive therapies.
- Attendees were asked to participate in an anonymous online pretest. The questionnaire consisted of twenty multiple-choice questions that were derived from the content of the presentation. Following the presentation, participants took a posttest consisting of the same questions as the pretest.

Visual References