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Ankle and Bier Blocks: An Objective Structured Clinical Examination for Student Registered Nurse Anesthetists

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ANKLE AND BIER BLOCKS: AN OBJECTIVE STRUCTURED CLINICAL EXAMINATION FOR STUDENT REGISTERED NURSE ANESTHETISTS

by

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ABSTRACT

The goal behind this doctoral project was to create a tool that could be utilized by student registered nurse anesthetists (SRNAs) at The University of Southern Mississippi (USM) on how to perform both an ankle and a bier block. An objective structured clinical evaluation (OSCE) for performing ankle and bier blocks was the foundation for this doctoral project. Best practice techniques were researched and implemented into the development of this OSCE. The OSCE was developed and aimed at increasing the competency and confidence of SRNAs as they enter the clinical setting.

Patient safety was the center of the development of this OSCE. This OSCE will allow SRNAs to become more confident in performing ankle and bier blocks by practicing these blocks in a controlled environment before entering clinicals. The OSCE will ultimately lead to increased competency and patient safety in the clinical setting.

The ankle and bier block OSCE was provided to four USM faculty members, 17 2nd year SRNAs, and 20 3rd year SRNAs with an anonymous survey to complete. In total, 38 surveys were received. Of the surveys received, 100% of the participants agreed that the OSCE clearly states the instructions on how to perform ankle and bier blocks and that the OSCE includes all of the necessary information for SRNAs to be successful in the clinical setting. Suggestions were provided through survey feedback and some alterations were made to the OSCE to improve the overall effectiveness. Based on literature review and survey results, the OSCE on ankle and bier blocks could potentially benefit SRNAs as they prepare to enter clinicals.

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DEDICATION

We would like to dedicate this doctoral project to some very important people in our lives, our families. To our families: we would like to show our deepest gratitude to you. Thank you for being our constant support system and pushing us to be the best version of ourselves. We are humbly grateful for your endless love and encouragement. Simply put, we would not be to this point in our lives without you. You all mean the world to us, and we could not have hand-picked a better family.

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LIST OF ABBREVIATIONS

AACN	American Association of Colleges of Nursing
AANA	American Association of Nurse Anesthetists
CRNA	Certified Registered Nurse Anesthetist
DNP	Doctor of Nursing Practice
EBP	Evidence-Based Practice
IRB	Institutional Review Board
IV	Intravenous Catheter
IVR	Intravenous Regional Anesthesia
LAST	Local Anesthetic Toxicity
NAP	Nurse Anesthesia Program
NBCRNA	National Board of Certification and Recertification for Nurse Anesthetists
OSCE	Objective Structured Clinical Examination
OR	Operating Room
SRNA	Student Registered Nurse Anesthetist
USM	The University of Southern Mississippi

CHAPTER I - INTRODUCTION

Student Registered Nurse Anesthetists (SRNAs) are educated and trained through a variety of lectures, textbooks, simulations, videos, and clinical rotations. The combination of didactics and clinical practice incorporates an abundance of information for SRNAs to learn. “Knowledge at one point in time, however, is not enough to ensure currency with evolving knowledge, skills, and technologies or to allow the profession to respond quickly to changing trends” (National Board of Certification and Recertification for Nurse Anesthetists [NBCRNA], 2021, n.p.). Consequently, the knowledge that SRNAs obtain is founded on a combination of intellectual and clinical competence.

According to The University of Southern Mississippi (USM) Nurse Anesthesia Program’s (NAP) policy and procedure manual, SRNA’s must learn a variety of skills and techniques to meet the criteria of specific preceptors and procedures. The diverse skillset of Certified Registered Nurse Anesthetist (CRNA) is illustrated through the various skills required within the scope of practice of CRNAs. CRNAs practice in diverse surgical centers consisting of dentist offices, orthopedic institutes, trauma centers, pain management clinics, and obstetrical surgery centers. CRNAs practice in diverse surgical centers consisting of dentist offices, orthopedic institutes, trauma centers, pain management clinics, and obstetrical surgery centers. (American Association of Nurse Anesthetists [AANA], 2021). The variability in learning anesthesia presents the opportunity for the development of an OSCE to assist in the learning process for SRNAs. With the contribution of an OSCE, SRNAs have the potential to become more thoroughly equipped for didactic and clinical practice through simulation-based training.

Problem Description

In USM's NAP, SRNAs have a strong didactic background because the first year of the program is solely dedicated to building a knowledge-based foundation. Although SRNAs are sufficiently educated through didactic coursework, SRNAs lack clinical application. Due to the differences in didactic and clinical training, each SRNA's evaluation should parallel their level of competence. However, the literature review states that CRNAs, who precept SRNAs in the clinical setting, often have higher expectations than the SRNA's level of clinical experience. Therefore, the biased views of precepting CRNAs may skew the clinical evaluations of SRNAs (Bonanno, 2019).

Also, researchers agree that in the clinical setting, CRNAs do not have communicated standards for SRNAs. When evaluating SRNAs, the literature states CRNAs lack the following: clarity, objectivity, constructiveness, reliability, timeliness, validity, holistic integration, and generalizability, which all potentially contribute to decreased effectiveness in the evaluation and education of SRNAs (Bonanno, 2019). Implementing an objective tool will standardize SRNA evaluations and expectations by defining clinical expectations, outcomes, validating behaviors, providing feedback, identifying areas of struggle, and improving the overall quality of patient care and safety (Bonanno, 2019).

Finally, since patient safety is always the priority of anesthesia providers, it is essential to prepare SRNAs for critical situations in the simulation setting. Simulation-based training allows students to develop, assess, and practice clinical skills in a controlled environment (Aronowitz et al., 2017). These simulation experiences have

proved to be beneficial in preparing SRNAs for stressful clinical situations (Stone, 2012). Overall, simulation-based training allows SRNAs to learn without risking patient safety.

According to the NBCRNA (2021), “anesthesia is a lifelong learning process of acquiring skills and knowledge and the ability to apply those skills and knowledge to practice; therefore, learning is placed on a continuum” (p. 3). The student should gain foundational knowledge and feedback from simulation experiences, then be tested in the simulation setting based on their level of competency (Bonanno, 2019). Overall, simulation-based training allows SRNAs to make mistakes and the appropriate corrections in a controlled environment, leading to successful learning experiences and increased competency in the clinical setting.

Statement of the Problem

According to the American Association of Nurse Anesthetists (AANA, 2019) Standards for Nurse Anesthesia Practice, Standard 14 states that nurse anesthetists must “foster a collaborative and cooperative patient care environment through interdisciplinary engagement, open communication, a culture of safety, and supportive leadership” (p.4). However, there are instances where patient safety may be jeopardized. According to an AANA article, occupational stress is defined as the harmful physical and emotional reverberations that occur in response to the demands and expectations of an occupation. (Stone, 2012). Stress is an inevitable experience while the SRNA is in training. SRNAs experience many stressors such as information overload, loss of income, relocation, and lack of personal time (Stone, 2012). The compounding load of newly learned information and skills can be overwhelming for SRNAs, which can potentially place the patients’ safety at risk.

While SRNAs are taught many fundamental skills, nerve blocks are one of the most difficult skills required as a result of appropriate nerve identification and precise placement of local anesthetics (Barash et al., 2017). Occasionally, SRNAs are taught nerve blocks in the clinical setting by observation. However, introducing a new skill in the clinical setting can cause unwarranted stress for the SRNA. This overwhelming experience can be avoided through the implementation of an OSCE. Providing sufficient knowledge and training concerning regional anesthesia and nerve blocks is a major contributor to successfully providing anesthesia while maintaining patient safety.

Significance of the Problem

As SRNAs begin to practice anesthesia, postoperative pain becomes a major point of emphasis. “Nearly 20 percent of patients experience severe pain in the first 24 hours after surgery, a figure that has remained largely unchanged in the past 30 years” (Small & Laycock, 2021, p. 1). “In a 2016 observational study of over 15,000 patients undergoing surgery, 11% reported severe pain and an additional 37% reported moderate pain in the first 24 hours after surgery. Furthermore, patients reported concern about postoperative pain before ever entering the operating room (OR)” (Small & Laycock, 2021, p. 1).

There are numerous nerve blocks in regional anesthesia that alleviate postoperative pain. “Regional anesthesia techniques for upper- and lower-extremity blocks can be invaluable for specialized surgical procedures and immediate and long-term pain relief” (Nagelhout & Elisha, 2018, p. 1063). The bier block is one of the most effective and reliable regional techniques available for surgeries of the hand (Barash et. al., 2017). Literature also points out that the ankle block provides sufficient anesthesia for

foot surgeries due to all five nerves of the foot being blocked at the level of the ankle (Barash et al., 2017).

Researchers agree on the importance of providing regional anesthesia as evidenced by the benefits of postoperative pain management. Students should be appropriately educated and trained on the aforementioned blocks to adequately deliver anesthesia and manage pain. Therefore, the primary focus of this doctoral project is to develop a standardized evaluation tool that teaches SRNAs how to perform ankle blocks and bier blocks.

Available Knowledge

Objective Structured Clinical Examination (OSCE) and Student Preparedness

An OSCE is defined as an objective form of assessing clinical competencies both at the undergraduate and graduate levels (Onwudiegwu, 2018). An OSCE is considered objective due to students being tested on standardized skills and material; structured due to individualized competencies at each station; clinical because the tasks, skills, and materials are clinically structured; and examined as students' knowledge and skills are tested (Aronowitz et al., 2017). OSCEs are designed to provide guided direction while assessing the student's competency and judgment on specified skills.

In opposition to traditional clinical exams, the OSCE can evaluate the communication skills of healthcare professionals and their abilities to handle patients in unexpected situations (Zayyan, 2011). This simulated experience allows students to become more aware of areas of needed improvement. Literature review indicates that using OSCEs strongly supports a student's learning and preparation by providing reliable and simultaneous feedback (Mitchell & Jeffrey, 2013). With the implementation of

OSCEs into undergraduate and graduate-level courses, competency is improved, and the bias of preceptors is removed. Therefore, the development of an OSCE ultimately improves the preparation of students and solidifies a quality of safe delivery of care (Mitchell & Jeffrey, 2013).

Regional Anesthesia

Throughout the literature review, regional anesthesia has proven to be both safe and effective for patients undergoing surgical procedures. “Routine use of regional anesthesia for patients having surgery is supported by general safety and proven effectiveness as a targeted modality in the prevention and treatment of acute pain” (Bugada et. al., 2017, p. 1096). Regional anesthesia continues to evolve anesthesia through its precise, but versatile approach.

There are numerous options in regional anesthesia, all aimed at the reduction of perioperative pain. Peripheral blockade can additionally control the inflammatory response of surgical patients reducing the length of hospital stay (Bugada et. al., 2017). Of the numerous options of regional anesthesia, two common methods used in the OR and surgical centers are the ankle block and bier block.

Importance of the Ankle Block

Anesthesia providers have many responsibilities throughout surgical procedures, with one pertaining to controlling pain throughout the procedures. The method of controlling pain can be performed in a variety of methods, but a common approach is a regional anesthesia. “Peripheral nerve blocks can be used alone as the sole “surgical” anesthetic, as a supplement to provide analgesia with general anesthesia, or a step in providing postoperative analgesia.” (Barash et al., 2018, p. 945).

Ankle blocks are utilized in surgeries of the foot to reduce pain intraoperatively and postoperatively. Many surgeries can be accomplished using an ankle block, including the removal of bunions, toenails, and foreign bodies. Additional surgeries of the foot utilizing the ankle block include forefoot reconstruction, osteotomy, amputation of toes, and ulcer debridement (Kay et al., 2018, n.p.). “Ankle blocks should be avoided in patients with infection, edema, burns, soft tissue trauma, or distorted anatomy with scarring around block placement” (Kay et al., 2018, n.p.). It is common for patients diagnosed with diabetes to suffer from foot injuries and ulcers, therefore these patients commonly experience ankle blocks in the surgical setting. The use of the ankle block in diabetic patients suffering from severe peripheral neuropathy, provides great benefit to the use of the ankle block as in increases the enhances efficacy of the block (Flagg et al., 2019).

Ankle blocks are accomplished by blocking the five nerves (tibial, sural, superficial peroneal, deep peroneal, saphenous) that innervate the foot. “Four of the nerves are branches of the sciatic nerve consisting of the posterior tibial, deep peroneal, sural, and superficial peroneal nerves. The fifth nerve is the saphenous nerve, which is a sensory branch of the femoral nerve” (Flagg et al., 2019, n.p.). Additionally, three of the nerves are recognized as being superficially located (superficial peroneal, sural, saphenous) and the remaining two nerves (deep peroneal and tibial) are known as being deep within the anatomy of the foot. The ankle block proves to be an adequate alternative to general anesthesia while providing optimal postoperative pain control in those receiving the nerve blockade.

Importance of the Bier Block

The Bier block is attractive to anesthesia providers for many reasons. Not only is the Bier block cost-efficient, but it is also a safe and effective way to provide intravenous regional anesthesia (IVRA) to patients requiring hand or forearm surgery (Kraus et al., 2021). It is also a desired technique due to the major effects of providing a bloodless surgical field and quicker onset of sensory block (Urfalioglu et al., 2015). Finally, the bier block technique requires minimal equipment and can be used in any clinical setting.

The Bier block is best used for upper extremity surgeries such as the hand or wrist. This peripheral blockade is accomplished via two tourniquets, which are placed proximal and distal to the site of local anesthetic injection, and one small-bore intravenous catheter (IV). The tourniquets remain inflated for a minimum of twenty minutes (Nagelhout & Elisha, 2018). "Contraindications to receiving a bier block include patient's refusal, allergies to local anesthetics, impaired perfusion of the extremity, deep vein thrombosis or thrombophlebitis of the extremity, uncontrolled hypertension, surgical procedures in an extremity that cannot be completely exsanguinated, open wounds or crush injuries to the extremity" (Kraus et al., 2021, p. 4). Additional contraindications consists of surgeries lasting longer then two hours, sickle cell disease and an uncooperative patient. (Kraus et al., 2021).

There are drug and equipment-related complications that can occur during the Bier block. Since this block is administered intravascularly, the possibility of the local anesthetic entering the systemic circulation should be measured. Local anesthetic entering the systemic circulation presents as the phenomenon known as local anesthetic toxicity (LAST), which can range from mild to severe. The signs and symptoms of LAST

include tinnitus, perioral numbness, seizures, and cardiovascular collapse (Candido et al., 2018). When LAST is suspected, the local anesthetic should be discontinued, and the patient should be closely monitored for side effects. Although the risk of LAST is rare, it is imperative that the anesthesia provider understands the complications, symptoms, and how to respond when and if LAST should occur (Kraus et al., 2021).

Equipment-related complications include the following: “inadvertent or unintentional deflation of the cuff, cuff failure, a sudden increase in venous pressure within the occluded tissue to a level higher than cuff pressure, and an intact interosseous circulation” (Candido et al., 2018). A frequent complication associated with the Bier block is tourniquet pain. The use of a tourniquet can also lead to damage of the median, ulnar, and musculocutaneous nerves. The best practice guidelines state not to exceed a tourniquet time of two hours. This time frame reduces the postoperative risks of capillary and muscle damage due to tissue acidosis (Candido et al., 2018).

This OSCE emphasizes appropriate techniques and concerns related to bier blocks. The OSCE will also teach SRNAs to recognize and prevent complications. Providing SRNAs the opportunity to practice this particular skill before being evaluated will greatly enhance their learning experience and ultimately improve patient safety.

Pain Management

Pain management is a critical part of anesthesia for both CRNAs and SRNAs. As mentioned previously, the combination of regional anesthesia and general anesthesia accomplishes the goal of pain management both intraoperatively and postoperatively. In addition to better pain management, regional anesthesia can alter the inflammatory cascade by directly intervening in the anti-inflammatory effect of local anesthetics and

blunting sympathetic activation (Bugada et al., 2017). Promoting the use of regional anesthesia in eligible patients can undoubtedly limit the risk of complications, ICU/hospital stay, and improve rehabilitation outcomes (Capdevila et al., 2017).

Rationale

One of the AANA Standards for Nurse Anesthesia Practice is cultivating a culture of safety (AANA, 2019). The main barrier in this specific area is the lack of instruction on how to perform regional anesthesia properly and efficiently while fostering a safe environment. For this reason, it is imperative that the proper training and knowledge is provided to SRNAs. Implementing an OSCE to introduce accurate techniques, foundational knowledge, and instill competence will benefit SRNAs before performing ankle and bier blocks in the clinical setting. Additive evaluations, provided through the OSCE, will provide SRNAs with appropriate feedback on areas needing improvement, therefore, promoting efficiency and patient safety.

DNP Essentials

"The DNP is a degree designed specifically to prepare individuals for specialized nursing practice, and The Essentials of Doctoral Education for Advanced Nursing Practice articulates the competencies for all nurses practicing at this level" (AACN, 2006, p. 7). The American Association of Colleges of Nursing (AACN) created essentials that must be met to complete and receive a doctoral degree. USM's College of Nursing and Health Professions requires SRNAs, who is completing a Doctor of Nursing Practice (DNP) project, to meet the AACN DNP Essentials. The OSCE created meets all eight DNP Essentials, but prioritizes Essentials I, VI, VII, and VIII.

Essential I: Scientific Underpinnings for Practice

Scientific Underpinnings of Practice involves integrating doctoral research into the knowledge and practice of advanced nursing. Essential I was met in this doctoral project through the creation of an evidence-based OSCE to help assist in teaching best practice methods in regional anesthesia, specifically the ankle and bier block. The OSCE was developed to improve SRNA competency, in addition to improving postoperative pain control while maintaining patient safety.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Essential VI involves the communication and collaboration of multiple healthcare professionals in developing and implementing new plans to create change in healthcare facilities. This doctoral project met Essential VI by taking the considerations of other stakeholders such as SRNAs and USM's NAP faculty and implementing that into an OSCE which is specific to ankle and bier blocks. The created OSCE will assist the education and clinical progression of current and future SRNAs.

Essential VII: Clinical Prevention and Population Health for Improving Nation's Health

Essential VII is defined as the promotion of health and prevention of disease (AACN, 2006). Essential VII was met by providing education to SRNAs regarding patient safety when performing regional anesthesia. The OSCE equips SRNAs to educate their patients on the risks and benefits associated with regional anesthesia, specifically the ankle and bier blocks.

Essential VIII: Advanced Nursing Practice

"All DNP graduates are expected to demonstrate refined assessment skills and base practice on the application of biophysical, psychosocial, behavioral, sociopolitical, cultural, economic, and nursing science as appropriate in their area of specialization" (AACN, 2006, p. 16). Essential VIII was met in this project by providing future SRNAs with evidence-based practice research that demonstrates the performance and benefits of regional anesthesia. The OSCE will provide SRNAs with the appropriate skills and feedback to perform the ankle and bier blocks in various areas of anesthesia.

Specific Aims

The goal of this project is to create an OSCE that will serve both as a standardized teaching and evaluation tool for SRNAs in USM's NAP. The OSCE will allow students to learn while being evaluated based on the provided standardized OSCE criteria. Upon completion of the OSCE, SRNAs will be better equipped to safely perform ankle and bier blocks in the clinical setting.

Summary

The use of regional anesthesia is a favored technique due to the potential benefit it provides to patients. As patients undergo surgery, pain is a common concern and at times almost seems routine. With the implementation of the ankle and bier blocks, there is potential for better pain control. The development of this OSCE also allows SRNAs to learn how to efficiently perform ankle and bier blocks while ensuring patients receive competent and safe care. Finally, the simulated practice has the potential to decrease the performance stress of the SRNAs in the clinical setting (Aronowitz et al., 2017).

CHAPTER II - METHODS

The purpose of the project is to provide SRNAs with a standardized and structured assessment tool that accurately demonstrates how to perform an ankle and bier block. The identified gap in knowledge between the didactic level and the clinical level explains why SRNAs oftentimes enter clinicals with insufficient training on regional anesthesia. With the development of the OSCE, information, and training about regional anesthesia, specifically, the ankle and bier blocks, will become readily available. The availability of the OSCE will grant SRNAs the opportunity to study and learn the appropriate situations and techniques of performing the ankle and bier block before entering the clinical setting. The overall aim of the OSCE is to increase SRNA competency by providing a uniform technique on how to appropriately provide anesthesia and analgesia to a patient via an ankle and bier block.

Context

The application of the OSCE will be implemented by USM for the second-year students enrolled in the NAP. The second-year students have finished the intense didactic portion of the NAP and are in the first year of clinical rotations. USM's NAP is a three-year study plan that allows the SRNA to obtain a doctoral degree at graduation. In the NAP, there are 20 students admitted each January that are educated by four currently practicing CRNAs. During the first year of the program, the didactic study plan consists of anesthesia and doctoral research courses, which are taught via traditional face-to-face and online lectures. The last two years of the program shifts into a demanding clinical-based schedule, while simultaneously requiring the SRNA to continue the required anesthesia and doctoral research courses. Although the NAP plan of study incorporates a

simulation-based course throughout the three-year program, the simulation course is primarily used for first-year students. Therefore, SRNAs beginning clinicals in the second year have minimal hands-on experience. Additionally, the USM's NAP plan of study schedules regional anesthesia in the summer of the second year, which means second-year SRNAs do not have a basic knowledge of proper regional anesthesia techniques before starting clinicals.

The USM's College of Nursing and Health Professions offers a clinical simulation center, which includes intensive care, nursing home, OR, and med-surg unit. The OR is dedicated to the NAP and is reserved only for SRNAs. The simulated OR is organized to resemble a realistic hospital-based OR. The clinical simulation center is where first-year students gain hands-on experience with intubation manikins and anesthesia machines. Although anesthesia instructors are available to assist in the simulation lab, the lab is also readily available for individual practice.

Intervention

The project's design benefits SRNAs by helping to fill the gap in knowledge about regional anesthesia. The project's foundation was established following the USM NAP faculty's identification of the lack of student readiness in performing an ankle and bier block when entering the clinical setting. To address the aforementioned problem, literature was reviewed, and current evidence-based guidelines were established from the analyzed research to create an OSCE. The OSCE will provide a standardized learning tool for SRNAs in performing both an ankle and bier block. OSCEs provide valuable learning strategies and assess the abilities of providers to practice in the clinical setting (Mitchell & Jeffrey, 2013).

The learning tool embodies specific learner outcomes and learner objectives for the SRNA to achieve. The tool also includes a list of readings, lectures, videos, pictures, a step-by-step process, and a content outline with a patient scenario, which SRNAs must complete before advancing to the assessment portion. In addition, the tool contains a student debriefing form and an assessment rubric specific to the provided patient scenario. The OSCE assessment tool was presented to and approved by USM's NAP committee members, then it was submitted to and approved by The University of Southern Mississippi's Institutional Review Board (IRB). The OSCE is referenced by its protocol number IRB-21-225. Refer to Appendix A for the IRB approval letter.

Once approval from the IRB was granted, a panel of stakeholders was chosen for the project's evaluation and feedback. The stakeholders for the project included the following from the USM's NAP: 2nd and 3rd-year SRNAs and the four faculty members. The experts in the panel of stakeholders are the four faculty members who currently practice as CRNAs. The clinical expertise of the faculty members offers great value to critiquing and evaluating the specified skillset in the OSCE. The other stakeholders offer a different insight in the evaluation area as 2nd-year SRNAs have just begun clinicals, while 3rd-year SRNAs are approaching the final year of clinical experience. The evaluations allowed the stakeholders to provide anonymous feedback concerning benefits or needed improvements of the OSCE.

Based upon the evaluations and the input of the stakeholders, a table was created by collecting data from Qualtrics©. Qualtrics© is an electronic survey that enables participants to anonymously answer provided questions and submit feedback. After recording and analyzing the anonymous and confidential data, approval from the

committee chair was sought to execute changes. Once approval of changes was granted, a chair-approved video was created demonstrating the strategies and techniques in performing ankle and bier blocks. The OSCE, video, and summarized data were then presented and disseminated at the USM School of Leadership and Advanced Nursing Practice DNP Scholarship Day. After the DNP project, all electronic data stored on a password-protected computer and all physical data stored in a locked drawer were deleted and destroyed.

Measures

The expected outcome of this project encompasses current and evidenced-based research guidance about performing regional anesthesia, specifically the ankle and bier blocks, to current and future USM NAP students. The OSCE's design is to benefit SRNAs in both didactic and clinical practice by alleviating any unknowns in performing the ankle and bier blocks. After completion of the OSCE, SRNAs should be more confident in their skillset and knowledge of an ankle and bier block. The OSCE will potentially enable SRNAs to provide the utmost care to patients, improving pain management and therefore better patient outcomes. Throughout gathering research, the OSCE proves to be an essential learning tool for SRNAs. The stakeholders were given a survey after the OSCE. The survey measures and evaluates the OSCE's effectiveness and allows an opportunity for constructive feedback. The survey is found in Appendix C and contains the following questions:

1. Do you consent to participate in the evaluation of the OSCE for ankle and bier blocks?

2. Was this OSCE beneficial in presenting clear and exact instructions on the execution of ankle and bier blocks?
3. After participating in this OSCE, are you able to identify the possible complications of performing ankle and bier blocks?
4. After participating in this OSCE, are you able to identify the indications for the use of ankle and bier blocks?
5. After participating in this OSCE, are you able to identify the contraindications to the use of ankle and bier blocks?
6. After participating in this OSCE, are you able to identify the appropriate landmarks to perform ankle and bier blocks?
7. After participating in this OSCE, are you able to perform the correct techniques for the ankle and bier blocks?
8. In your opinion, does this OSCE include all of the necessary information to help SRNAs be successful in the clinical setting?
9. Please add any recommendations or comments that you have that would make this OSCE for ankle and bier blocks easier to understand for future SRNAs.

Data Collection and Analysis

The previously mentioned evaluation measures were used to provide qualitative and quantitative data to ensure this project optimally benefits SRNAs. Upon completion and collection of the evaluations, the gathered information was analyzed, organized, and summarized. Based on evaluation feedback, modifications were implemented into the development of the OSCE on performing ankle and bier blocks. The primary goal of the

measures and data analysis was to gain feedback on the overall clarity and quality of the OSCE to improve competence for SRNAs and potentially increase patient safety.

Ethical Considerations

"Certified Registered Nurse Anesthetists follow the American Nurses Association Nursing Code of Ethics in the daily practice and abide by the American Association of Nurse Anesthetists (AANA) Code of Ethics in guiding ethical decision-making," (Nagelhout & Elisha, 2018, p. 1145). All healthcare providers should place ethical considerations at the center of patient safety. The incorporation of this OSCE for future students has the potential to encourage patient safety during the performance of ankle and bier blocks. However, the faculty of the USM NAP could feel as though this OSCE is insufficient in teaching regional anesthesia techniques and opt to continue with the current curriculum of the NAP. Without the implementation of this OSCE into the USM NAP curriculum, SRNAs could be deemed insufficient in providing effective regional anesthesia.

Ethical differences were not deciding factors of participation and creation of this project. Surveys were sent out via email to participants and results were kept anonymous. There was no direct patient contact during the creation of this OSCE. In addition, there were no conflicts of interest. This project was submitted to the IRB to ensure that ethical considerations were met.

Summary

The OSCE was created due to a literature review indicating a lack of SRNA readiness to perform regional anesthesia in the clinical setting. Therefore, the OSCE has the potential to strengthen the curriculum of the NAP and to ensure SRNAs are properly

prepared for the clinical setting with the appropriate knowledge and skillset specific to ankle and bier blocks. This OSCE was created and submitted to the IRB after the appropriate evidence-based research was conducted. The panel of stakeholders was given the OSCE and an anonymous survey electronically. Based on the data from the evaluations, improvements were made to the OSCE. The OSCE was then presented to the NAP committee for potential inclusion into the NAP curriculum.

CHAPTER III - RESULTS

"Anesthesia care increasingly includes the use of regional anesthesia techniques, either as a primary anesthetic or to reduce the patient's postoperative pain" (Hirsch et al., 2019, p. 365). The optimal effect of regional anesthesia requires the provider to have essential knowledge, skills, and abilities to perform the appropriate techniques, which align with current evidence-based practice (EBP) guidelines (Hirsch et al., 2019). The USM NAP instructors recognized the gap in applying learned skills and knowledge into clinical practice. Therefore, an OSCE for the ankle and bier block is desired to assist in educating SRNAs. The purpose of the ankle and bier block OSCE is to allow SRNAs the opportunity to learn the required information and skills in a safe, low-stress, controlled environment before entering the clinical setting (Aronowitz et al., 2017).

Steps and Analysis of Intervention

After extensive EBP research was reviewed and analyzed, an OSCE was created. The OSCE includes learner outcomes and objectives, required readings, and a step-by-step process to aid in achieving the proper technique and knowledge needed for each block. Refer to Appendix B for each OSCE. In addition to the OSCE, an instructional video was created to demonstrate the step-by-step process of performing an ankle and bier block. Once the USM NAP committee members and the IRB evaluated and approved the OSCE, the following information was sent via email to the selected stakeholders to be evaluated: OSCE tool for the ankle block, OSCE tool for the bier block, and the demonstration videos of both the ankle and bier blocks. The respondents were then asked to consent to the survey, which ensured the respondents would remain anonymous. Once

the survey was completed, it was uploaded to Qualtrics® and secured via a password-protected computer.

The survey was sent to a total of 41 individuals. These individuals consisted of four USM NAP faculty, 20 3rd year USM NAP SRNAs, and 17 2nd year USM NAP SRNAs. Results of the surveys were collected two weeks after invitations were sent to participants. A total of 38 out of 41 surveys were completed and submitted for analysis. The results of each question were analyzed separately. In response to the first question of the survey, 100% of the participants were selected to participate in the study. In addition, 100% of participants also answered yes that the OSCE was beneficial in presenting clear and exact instructions on the execution of the ankle and bier block. Yes, was also the unanimous choice for being able to perform the correct techniques for the ankle and bier blocks. Lastly, six participants left additional comments on the last question. The suggestions in Table 1 were taken into consideration when revising the OSCE.

Table 1

Responses to Survey Question 9

Participant Number	Comment/Suggestion
9	"Awesome works!"
17	"This was a fantastic project. Your video quality was high, and you met your objectives wonderfully. GREAT JOB!"
29	"Great job"
30	"Excellent video. Your use of the mannequin let was wonderful. Great idea, team!"
31	"I think it would be nice to have a slide inserted before or after the still shot of supplies to be gathered listing them out to clarify unfamiliar names, for example, Esmarch Bandage, or Local of your choice" (put a couple of realistic examples underneath because clearly, it is unlikely that Tetracaine would be used in an ankle block). GREAT JOB GREAT VIDEO!"
38	"The OSCE word doc says limit surgery to 1 hour, but the video says 2 hours."

Summary

From the 38 collected survey responses, sufficient data was collected to verify the effectiveness of the OSCE. Based upon the comments mentioned in Table 1, it can be verified that the respondents received beneficial information from the OSCE. The data gathered from the respondents offered crucial and constructive suggestions, which were considered when finalizing the OSCE.

CHAPTER IV – DISCUSSION

The initiative behind this doctoral project is to develop an OSCE that enhances the curriculum of the NAP at USM. Additionally, this OSCE will provide SRNAs with simulated patient care, ultimately enhancing the care of patients and the skills of SRNAs in the clinical setting. This doctoral project was developed from compiled EBP data for the development of OSCEs and best practice guidelines for performing ankle and bier blocks. All methodology used in the development of this OSCE meets the AACN DNP Essentials.

Survey respondents were able to respond anonymously and unanimously agreed that the ankle and bier block OSCE was clearly and easily understood. The participants involved in the project included USM NAP staff members, who currently practice anesthesia, and USM NAP SRNAs in their 2nd and 3rd years of the program. The information gathered from the respondents provided insightful recommendations on how to improve the OSCE. Respondents ultimately agreed that the OSCE provided the appropriate information and properly prepared SRNAs to perform ankle and bier blocks in the clinical setting.

Interpretation

After gathering the appropriate feedback of survey respondents, there is a unanimous agreement that the ankle and bier block OSCE, supplementary information, and demonstration videos support EBP and thoroughly prepare SRNAs for future evaluations. The use of this OSCE in the simulation lab allows SRNAs to learn through a hands-on approach and when failures occur, questions can be asked, and faults are corrected without risks to the patient. From the gathered information, it can be concluded

that the implementation of the ankle and bier blocks OSCE into the USM NAP curriculum will better prepare SRNAs for the transition into the clinical setting.

Limitations

Limitations to our study consisted of small sample size, USM associated faculty and students, and the lack of OSCE implementation at other NAPs. The small sample size of participants was strictly based on voluntary participation, potentially limiting the critique of the OSCE. The sample size of participants consisted of four USM NAP faculty and a combination of 37 SRNAs. As a result of all participants being associated with the USM NAP, there is a potential bias in the responses. Additionally, the lack of research on OSCE implementation in other NAPs limited the results of this study. Although, OSCEs have been used to evaluate nurse practitioners; therefore, OSCEs can be implemented into the evaluation of SRNAs in NAPs.

In the future, researchers could add to the sample size by adding 1st-year USM NAP students to the sample size. This addition would also give researchers insight into the effectiveness of the OSCE for beginners. In addition, surveys could be provided to additional CRNAs and participants outside of the USM NAP to better enhance the OSCE before the implementation into the USM NAP curriculum.

Conclusion

This OSCE has been presented to USM's NAP for consideration to be included in the program's OSCE library. In addition, the OSCE and its other affiliated documents have the potential to be utilized in other medical programs. If adopted into practice, this OSCE would provide SRNAs the opportunity to become competent and confident in performing ankle and bier blocks in the simulation setting. Introducing these skills in a

controlled environment allows SRNAs to fail without causing harm to patients, therefore allowing them to ask questions and become more comfortable and confident in their skills. The purpose of this doctorial project is to assure that SRNAs have the fundamental knowledge needed to appropriately perform an ankle and bier block.

APPENDIX A – IRB Approval Letter

Office *of*
Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

118 COLLEGE DRIVE #5125 • HATTIESBURG, MS | 601.266.6576 | USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-21-225
PROJECT TITLE: Objective Structured Clinical Evaluation for Ankle and Bier Blocks for Student Nurse Anesthetists
SCHOOL/PROGRAM: Leadership & Advanced Nursing, School of PRNP
RESEARCHER(S): Taylor Harmon, Michong Rayborn, Steven Harmon
[redacted]
IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited
[redacted]7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: July 22, 2021

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B - OSCE

Anesthesia Objective Structured Clinical Exam for an Ankle Block

LEARNER OUTCOMES:

1. Proper use of equipment to perform an ankle block.
2. Be able to locate specific landmarks pertaining to the ankle block.
3. Successfully deliver local anesthetic to the specified nerves included in an ankle block.

DOMAINS: Clinical skill, Formative evaluation – feedback, Performance assessment

PURPOSE: Develop clinical skills to perform an ankle block.

LEARNER OBJECTIVES:

1. Identify patient population eligible/ineligible for an ankle block.
2. Demonstrate competency in locating pertinent landmarks and performing an ankle block.
3. Appropriately deliver local anesthetic to the desired nerves.

INDIVIDUAL OR GROUP OSCE: Individual OSCE; One SRNA in the simulation lab at a time precepted by a senior SRNA that has already participated in the OSCE and has been deemed qualified by a NAP instructor to teach other SRNAs.

REQUIRED READING and ASSOCIATED LECTURES:

1. Nagelhout: Chapter 50; pages 1061-1063

REQUIRED VIDEO: A corresponding video created for the OSCE

REQUIRED PARTICIPANTS: Junior SRNA for OSCE participation; Senior SRNA for Formative Evaluation and Performance Assessment

VENUE: University of Southern Mississippi – Hattiesburg: NAP Simulation Lab

STUDENT LEVEL OF OSCE: 2nd-year SRNA

TIME ALLOTED: 30 minutes

(This includes the time it takes for students to gather supplies, set up, and practice the entire sequence of steps one time through)

CONTEXT:

You are assigned to Mr. Johnson who has uncontrolled diabetes presenting to surgery for a toe amputation. Mr. Johnson's labs are the following: HR 87, BP 138/78, RR 12, SpO2 99% on room air. Mr. Johnson is also obese (BMI 33.6) and has previously been diagnosed with hypertension. He currently takes Lisinopril (20 mg) for hypertension. His last dose was taken the morning of surgery. All other labs and x-rays are unremarkable and within the normal ranges. The surgeon in this case wants to do an ankle block. As the anesthesia provider, demonstrate your knowledge and skills in performing the ankle block needed for this procedure.

EQUIPMENT& SUPPLIES:

- Gloves
- Antiseptic solution (Chloraprep)
- Marking Pen
- Gauze
- 30 mL syringe or three 10 mL syringes
- 1.5 - 2 in, 25-gauge needle
- Local Anesthetic: 0.5% Bupivacaine or 2% Lidocaine is most commonly used; no epinephrine should be added to the local anesthetic

SITE SELECTION:

The ankle block can be performed in the prone, lateral, or supine positions, but is aimed at the comfort of the patient. The Posterior Tibial Nerve is the first nerve to be blocked and is located by locating the Posterior Tibial artery. The Sural nerve is the second nerve to be blocked and is located laterally to the Posterior Tibial Nerve. The two nerves are more exposed with the patient positioned in the prone position. The superficial Peroneal, deep Peroneal, and the saphenous nerves are the next nerves to be blocked. These nerves are located anterior to the malleolus and are accessed best with the patient in the supine position. The goal is to be able to locate and efficiently block the five nerves associated with an ankle block (tibial, sural, superficial peroneal, deep peroneal, and saphenous nerves).

TASK STATEMENT:

Your task is to select the appropriate location for an ankle block, demonstrate how to locate the nerves that will be blocked, and perform the blockade using the identified landmarks.

PROCESS:

1. Identifies patient, verifies procedure, and obtains consent
2. Gather all supplies to perform an ankle block
3. Perform a timeout before beginning the block
4. Position the patient according to the comfort level of the patient.
5. Identify the correct ankle and assess the ankle for any contraindications.
6. Locate the appropriate anatomical landmarks needed to perform the block.
7. Prepare supplies for performing the block.

8. Clean the site thoroughly with an antiseptic agent.
9. Insert the needle into the skin. Be aware of the possible paresthesia that may be experienced by the patient.
10. Deliver local anesthetic around the nerve bundles when paresthesia is experienced or verification of correct needle placement.
11. Monitor for any signs of LAST or post-surgical paresthesia. Paresthesia will resolve on its own.
12. Evaluate the effectiveness of the blockade

IMAGES:

Figure A1. *Saphenous Nerve Block*

Saphenous nerve block: insertion site just posterior to the medial malleolus. Used with permission from the New York School of Regional Anesthesia. http://nysora.com

Figure A2. *Superficial Peroneal Nerve Block*

Superficial peroneal nerve block: insertion site anterior to the medial malleolus. Used with permission from the New York School of Regional Anesthesia. http://nysora.com

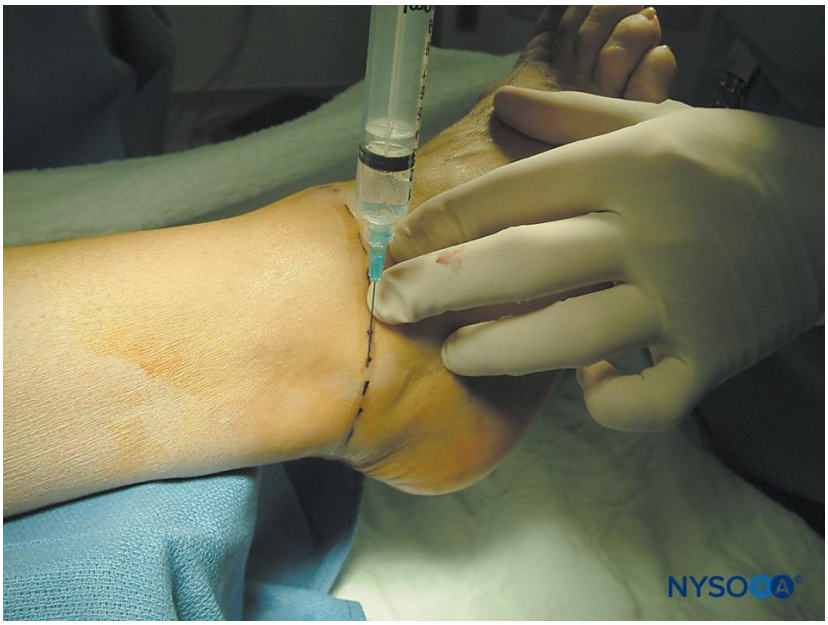

Figure A3. *Sural Nerve Block*

Sural nerve block: insertion anterior to the lateral malleolus. Used with permission from the New York School of Regional Anesthesia. http://nysora.com

Figure A4. *Deep Peroneal Nerve Block*

Deep peroneal nerve block: insertion of a needle in the anterior aspect of the ankle between the lateral and medial malleoli. Used with permission of New York School of Regional Anesthesia. http://nysora.com

Figure A5. *Posterior Tibial Nerve Block*

Posterior tibial nerve block: insertion of needle posterior to the medial malleolus. Used with permission of the New York School of Regional Anesthesia. http://nysora.com

DEBRIEFING FORM:

1. What five nerves are being blocked when using the ankle block?
    a. Tibial, Superficial Peroneal, Deep Peroneal, Saphenous, and Sural (Nagelhout, 2018, p. 1061)
2. What are contraindications to performing an ankle block?
    a. Patients with gangrene of the foot or those with diabetes who have foot ulcers (Nagelhout, 2018, p. 1061)

b. Ankle block should be avoided in patients with local infection, edema, burns, soft tissue trauma, or distorted anatomy with scarring in the area of block placement (Kay et. al., 2018).

3. What are the indications of performing an ankle block?
    a. Surgeries of the foot include bunionectomy, forefoot reconstruction, arthroplasty, osteotomy, and amputation of toes (Kay et. al., 2018).
4. Do you feel this simulation prepared you for clinical practice?

QUESTION & DEMONSTRATION STATION:

	TASKS	PASS	FAIL	COMMENTS
	1. Gathers and prepares the correct equipment			
*	2. Performs timeout identifying the correct patient and procedure before beginning.			
*	3. Position patient appropriately for the procedure			
*	4. Identifies correct anatomical landmarks appropriate for the procedure.			
*	5. Assess for any contraindications to the procedure			
	6. Inserts needle at the correct angle in the appropriate location			
	7. Demonstrates/Verbalizes what should be expected and what nerves are being blocked			
*	8. Injects the proper amount of local anesthetic around the desired nerves			
	9. Assess patient for signs and symptoms of LAST and paresthesia			
	10. Re-evaluates the efficacy of the ankle block			

Steps with * Must be properly completed. All steps must be completed/passed to receive a passing grade.

The OSCE by the student demonstrates foundational knowledge and correct use of the ultrasound machine in obtaining IV access: (Circle one) **PASS FAIL**

Does the student need to repeat this OSCE at a later date to satisfy learning requirements? (Circle one) **YES NO Date to return for evaluation: _____**

EXAMINER: _____ DATE: _____

Anesthesia Objective Structured Clinical Examination for a Bier Block

LEARNER OUTCOMES:

1. Describe the proper use of equipment to perform a bier block
2. Be able to recognize potential complications and contraindications
3. Be able to perform safe and effective bier block
4. Gain confidence in performing this clinical skill

DOMAINS: Clinical skill, Formative evaluation – feedback, Performance assessment

PURPOSE: Student practice and Performance Assessment

LEARNER OBJECTIVES:

1. Identify the potential complications and contraindications of a bier block
2. Demonstrate competence and confidence in performing bier block technique
3. Appropriately administer local anesthetic intravascularly to achieve the bier block

INDIVIDUAL OR GROUP OSCE: Individual OSCE; One SRNA in the simulation lab at a time precepted by a senior SRNA that has already participated in the OSCE and has been deemed qualified by a NAP instructor to teach other SRNAs.

REQUIRED READING and ASSOCIATED LECTURES:

1. Nagelhout: Chapter 50; pages 1055-1056
2. Barash: Chapter 36; pages 977-978
3. https://www.nysora.com/techniques/intravenous-regional-anesthesia/intravenous-regional-block-upper-lower-extremity-surgery/

   The link of a source is used with permission from the New York School of Regional Anesthesia. https://nysora.com

REQUIRED VIDEO: A corresponding video created for the OSCE

REQUIRED PARTICIPANTS: Junior SRNA for OSCE participation; Senior SRNA for Formative Evaluation and Performance Assessment

VENUE: The University of Southern Mississippi Nurse Anesthesia Simulation Lab in Hattiesburg, MS

STUDENT LEVEL OF OSCE: 2nd-year SRNA

TIME ALLOTED: 30 minutes (This includes the time it takes for the student to gather supplies, set up, and practice through one time)

SEQUENTIAL PRACTICE & TESTING: Lab stations will be completed in the following sequence: knowledge of contraindications, knowledge of complications, peripheral IV access, and use of tourniquets. This OSCE is peer-led to reduce performance anxiety related to clinical setting stressors which creates a more conducive learning environment for the junior SRNA.

RECOMMENDED PRACTICE PRIOR TO EXAMINATION: 3X is recommended per station, 30 minutes each (90 minutes total)

CONTEXT:

You are assigned to Mrs. Gressett who has been a surgical technologist for the last 15 years. She is now suffering from carpal tunnel syndrome and presents for surgery on her left wrist. Mrs. Gressett's current vitals are as follows: HR 80 BP 131/81 RR 15 SpO2 99% RA. Mrs. Gressett is considered obese (BMI 31.4) and has a medical history of type 2 diabetes. Mrs. Gressett takes insulin (the last dose this morning) to control her blood sugar. Her chest x-ray and labs are unremarkable, and all values are within normal limits. The physician requests a Bier block to help keep the surgical field bloodless and to assist with intraoperative surgical pain. As the nurse anesthetist for Mrs. Gressett, demonstrate your knowledge of a Bier Block and perform this procedure following the steps outlined in this OSCE.

EQUIPMENT& SUPPLIES:

- Gloves
- Adhesive tape
- Antiseptic solution for skin disinfection (alcohol or chloraprep wipe)
- One 20- or 22-gauge peripheral intravenous catheter (PIVC)
- One rubber tourniquet for use before PIVC insertion
- Local anesthetic agents: 0.5% lidocaine (without preservatives)
- One 500 mL or 1 L bag of IV solution primed infusion set to be connected to the PIVC to maintain its patency until the injection of local anesthetic solution is administered in the identified extremity, or a Heplock can be used

- Double pneumatic tourniquet system with a proximal and distal appropriately sized cuff for the selected extremity
- One Esmarch bandage 60 in. in length and 4 in. wide for exsanguinating the arm
- A 50-mL Luer lock syringe
- Standard American Society of Anesthesiologists (ASA) monitors to measure vital signs (blood pressure, pulse oximetry, and electrocardiograph)
- Resuscitation equipment (PIVC, crystalloid solution, and infusion set for the opposite upper extremity)

SITE SELECTION:

The patient can lie in any comfortable position; however, it is common for the patient to be placed in the dorsal recumbent position. In preparation for elbow surgery, the PIVC will be placed in the forearm or antecubital fossa. Hand or forearm surgeries will require the PIVC to be placed in the dorsum of the hand.

TASK STATEMENT:

Your task is to identify appropriate candidates for this regional anesthesia technique, identify potential complications/contraindications, gather the appropriate equipment needed to properly perform a Bier block, and walk the preceptor through performing the block.

PROCESS:

1. Identify patient, verify surgery, & obtain consent for intravenous regional anesthesia
2. Supplies- gather all the supplies needed for the bier block and peripheral IV
3. Patient position- ensure the patient is comfortable

4. Perform timeout before beginning the procedure
5. Identify site selection for block
6. Properly clean the skin of the hand where the PIVC will be inserted
7. Place PIVC on the dorsum of the hand to be operated on
8. Place a double-pneumatic tourniquet with the proximal cuff high on the upper arm
9. Elevate arm for 1-2 minutes to allow passive exsanguination
10. Wrap the Esmarch bandage on the arm for further exsanguination. Begin at the distal limb and move proximally until you reach the distal cuff of the double tourniquet.
11. Inflate distal cuff at least 100 mmHg above systolic blood pressure or to 250 mmHg
12. Then, inflate the proximal cuff.
13. Once the proximal cuff is inflated, deflate the distal cuff.
14. Remove the Esmarch bandage.
15. Palpate for a radial pulse. It should not be present.
16. Ensure patency of PIVC with IV solution
17. Slowly inject 50 mL of 0.5% lidocaine HCL (without preservatives) via PIVC
18. As injecting the lidocaine, ask the patient to let you know if they experience any of the following symptoms associated with local anesthetic toxicity (LAST): lightheadedness, blurred vision, tinnitus, perioral tingling, or metallic taste in the mouth.
19. While assessing the patient for any signs or symptoms associated with LAST, be sure to note that their vital signs remain stable.

20. After administration of lidocaine, the PIVC may be left in placed or removed. If removed, hold pressure for several minutes to prevent bleeding.
21. After administration of lidocaine, the tourniquet must be left in place for a minimum of 20 minutes.
22. Upon completion of 20-minute minimal tourniquet time and cessation of surgery, deflate the cuff and immediately reinflate the cuff while observing the patient for signs and symptoms associated with LAST.
23. If no apparent symptoms of LAST occur after 1 minute, deflate the cuff and immediately reinflate it for 1-2 minutes.
24. If during this period the patient does not exhibit symptoms of LAST, the tourniquet may safely be deflated and removed from the extremity
25. Tourniquet time should not exceed 2 hours.
26. Tourniquet pain often occurs at 45-60 minutes after cuff inflation. When this occurs, since the proximal cuff is currently inflated, first inflate the distal cuff. Then, deflate the proximal cuff.
27. Be sure to document tourniquet location, tourniquet pressures, and inflation/deflation times on the anesthesia record

IMAGES:

Figure A6. *Double-Pneumatic Tourniquet Machine*

Use of the double-pneumatic tourniquet system. Used with permission from the New York School of Regional Anesthesia.

http://nysora.com

Figure A7. *Peripherally Inserted Venous Catheter*

Insertion of a peripheral intravenous catheter for injection of local anesthesia. Used with permission from the New York School of Regional Anesthesia. http://nysora.com

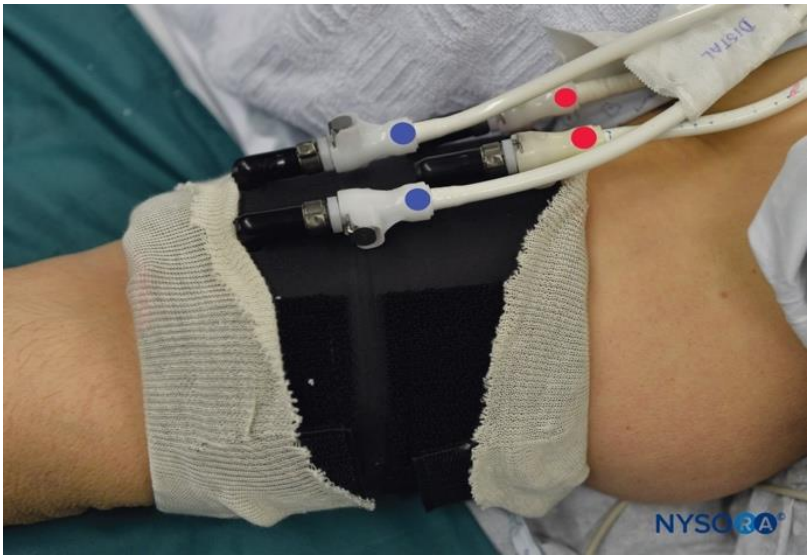

Figure A8. *Double-Pneumatic Tourniquet*

Double-pneumatic tourniquet: proximal is red and distal is blue. Used with permission from New York School of Regional Anesthesia. http://nysora.com

Figure A9. *Elevation of Extremity*

Elevation of the upper extremity to allow passive exsanguination. Used with permission from New York School of Regional Anesthesia. http://nysora.com

Figure A10. *Esmarch Bandage Application*

Esmarch application to upper extremity starting at the fingertips and traveling to the distal cuff. Used with permission from the New York School of Regional Anesthesia. http://nysora.com

DEBRIEFING FORM:

1. What are the possible complications of a Bier block?
2. What is the minimum time the tourniquet must remain in place after injection of lidocaine?
3. What are the LAST signs and symptoms?
4. If the patient complains of tourniquet pain, how do you attempt to relieve this discomfort?
5. Do you feel this simulation prepared you for clinical practice?

ASSESSMENT QUESTION & DEMONSTRATION STATION:

	TASKS	PASS	FAIL	COMMENTS
	1. Prepares and selects appropriate equipment for Bier block			
*	2. Selects appropriate site selection with proper antiseptic technique			
*	3. Verbalizes indications, contraindications, and complications for Bier block			
*	4. Demonstrates proper use of double-pneumatic tourniquet (positioning, inflation, and deflation)			
*	5. Assesses patient for LAST signs and symptoms			
	6. Verbalizes appropriate amount of lidocaine to be injected			
	7. Identifies expected outcome of the Bier block			
*	8. Verbalizes minimal tourniquet time after lidocaine administration			
	9. Verifies appropriate time to remove PIV catheter			
	10. Re-evaluates effectiveness of the Bier block			

Steps with * Must be properly completed. All steps must be completed/passed to receive a passing grade.

The OSCE by the student demonstrates foundational knowledge and correct technique in performing the Bier block: (Circle one) **PASS FAIL**

Does the student need to repeat this OSCE at a later date to satisfy learning requirements? (Circle one) **YES NO Date to return for evaluation: _____**

EXAMINER: _____ DATE: _____

APPENDIX C – Survey Questions

Evaluation of OSCE for Ankle and Bier Blocks

Thank you for evaluating this OSCE for ankle and bier blocks. Participation in this evaluation is completely voluntary, however, your feedback can provide valuable information to assist future SRNAs in the Nurse Anesthesia Program at the University of Southern Mississippi.

1. Do you consent to participate in the evaluation of the OSCE for ankle and bier blocks?	YES	NO
2. Was this OSCE beneficial in presenting clear and exact instructions on the execution of ankle and bier blocks?	YES	NO
3. After participating in this OSCE, are you able to identify the possible complications of performing ankle and bier blocks?	YES	NO
4. After participating in this OSCE, are you able to identify the indications for the use of ankle and bier blocks?	YES	NO
5. After participating in this OSCE, are you able to identify the contraindications to the use of ankle and bier blocks?	YES	NO
6. After participating in this OSCE, are you able to identify the appropriate landmarks to perform ankle and bier blocks?	YES	NO
7. After participating in this OSCE, are you able to perform the correct techniques for the ankle and bier blocks?	YES	NO
8. In your opinion, does this OSCE include all the necessary information to help SRNAs be successful in the clinical setting?	YES	NO
9. Please add any recommendations or comments that you have that would make this OSCE for ankle and bier blocks easier to understand for future SRNAs.		

Comments:

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