ADCE 2024
Poster Abstracts

Evidence-Based Practice

Abstract 1

Cognitive Aid Implementation for Perioperative Crisis Management

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Background/Purpose/Question: Perioperative crises are relatively infrequent and can result in detrimental patient outcomes without prompt recognition and accurate treatment. In high-stress scenarios, providers are prone to cognitive errors such as tunneling of attention, loss of situational awareness, medication errors, fixation on an incorrect problem, and poor team communication. Utilization of a cognitive aid (CA) has been proven in the literature to improve perioperative crisis management. This project addressed the following question: Does the implementation of a CA improve adherence to critical steps during a perioperative crisis and increase the confidence of anesthesia providers? Ultimately, the goal was to gain buy-in for the implementation of a standardized emergency manual at the authors' healthcare institution.

Methods/Evidence Search: A team of four participants completed a simulation without the use of a CA, followed by an education session on CA use, then repeated the simulation using a CA. The simulation scenario was based on local anesthetic systemic toxicity (LAST) in a patient under general anesthesia. The simulation and education session were broadcast to the Anesthesia Department via Microsoft Teams. A checklist of appropriate treatment actions was compiled using the Stanford Emergency Manual. The following data points were collected and compared pre- and post-education: time to recognition of LAST, time to intralipid administration, time to crisis resolution, and the number of critical steps completed. A survey was sent virtually to the department to assess the level of confidence in using a CA as well as familiarity in treating LAST. When completing a review of literature concerning this topic, the following keywords were utilized: emergency manual, cognitive aid, anesthesia, perioperative crisis, simulation, and Stanford Emergency Manual.

Synthesis of Literature/Results/Discussion: The findings from this evidence-based study were congruent with existing research evidence and supportive of the need for CA implementation. The study results showed that use of a CA improved adherence to critical steps in crisis management from 78% to 100%. A similar study (Ferré et al) was produced where scores on developing a crisis management plan improved from 37% to 89% with use of a CA OBJ Other findings from our study included that 100% of respondents felt that having a CA available in the operating room would be useful. Benefits to CA use include decreased stress, improved teamwork, calmed atmosphere, and reduced errors from omission OBJ Similarly, anesthesia departments in China reported that greater than 80% of providers agreed that having an emergency manual improved confidence, made crisis management more organized, and improved team cooperation (Huang et al) Further studies need to highlight specific real-life scenarios. Most of the evidence-based literature on this topic includes simulation-based studies. As more institutions routinely use CAs in their operating rooms, research is needed on how CAs impact provider performance in real time as well as patient outcomes.

Conclusion/Recommendations for Practice: The results from this study are congruent with relevant literature showing that CAs improve the overall treatment of perioperative crises and adherence to critical steps. Patient outcomes may improve with faster time to recognition, appropriate treatment interventions, and ultimately crisis resolution. CA use may reduce the treatment of incorrect problems and decrease excessive use of resources when ruling out differential diagnoses. The literature

surrounding simulation training for these crisis events shows a strong correlation to improvement in outcomes and provider feelings of competence in their role. Based on the results of this project combined with the literature, we recommend using simulation training for anesthesia providers to become competent and confident in using CAs. Ultimately, the goal is for CAs to be utilized in operating rooms during live perioperative crises.

Evidence-Based Practice

Abstract 2

Preventing Spinal-Induced Hypotension during Elective Cesarean Section

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Background/Purpose/Question: Spinal anesthesia is the preferred anesthetic for elective cesarean sections. Roughly 70%-80% of cesarean sections done under spinal anesthesia result in hypotension. This project aimed to improve patient safety and satisfaction by preventing spinal-induced hypotension in elective cesarean sections with an evidence-based protocol. The project answered the following question: In adult patients receiving spinal anesthesia for elective cesarean section, compared to the current practice of not having a standardized protocol, does the implementation of a standardized intraoperative protocol including the co-loading of IV fluid, the administration of IV ondansetron prior to the initiation of spinal anesthesia, and the initiation of a phenylephrine infusion at the time of spinal anesthetic injection reduce the incidence of spinal-induced hypotension?

Methods/Evidence Search: CINAHL, Embase, PubMed, and Google Scholar were searched for relevant articles. The reference lists of randomized controlled trials (RCTs), systematic reviews, and literature reviews obtained from CINAHL, Embase, PubMed, and Google Scholar were used to discover additional articles. Search terms included: phenylephrine OR phenylephrine infusion, co-loading, spinal anesthesia OR subarachnoid block, ondansetron OR Zofran OR serotonin antagonist OR 5-HT3, hypotension OR low blood pressure OR hypotensive OR hypoperfusion, cesarean section OR caesarean section OR c-section OR cesarean delivery. This search strategy identified roughly 80 nonduplicate articles. Ultimately, 36 articles were chosen for inclusion to provide information on the evidence-based interventions. Articles were excluded if they were published in a language other than English and published before the year 2017.

Synthesis of Literature/Results/Discussion: The selected articles provided critical information on the protocol's evidence-based interventions. Eleven RCTs discovered that patients who received IV ondansetron prior to spinal anesthesia had a statistically significant reduction in hypotension incidence. Multiple studies also revealed that a prophylactic phenylephrine infusion decreased the incidence of spinal-induced hypotension during cesarean section, with a low and variable infusion rate being the most effective. Many studies identified co-loading, rather than pre-loading, as the superior technique in preventing and/or reducing the incidence of spinal-induced hypotension. An RCT determined that hypotension incidence decreased from 33% to 17% when providing patients with both a phenylephrine infusion and IV ondansetron. Additionally, a literature review reported a study where the combination of an IV fluid co-load and a phenylephrine infusion reduced the incidence of hypotension from 28% to 2%. Overall, a significant amount of literature demonstrated that these three evidence-based interventions, both individually and together, significantly reduce the incidence of spinal-induced hypotension in women undergoing an elective cesarean section. Future research should focus on the combination of multiple interventions to prevent this phenomenon and its associated negative sequelae.

Conclusion/Recommendations for Practice: Overall, spinal-induced hypotension can lead to maternal nausea and vomiting, decreased perfusion to the fetus, and fetal compromise. Maternal and fetal outcomes are the top priority during cesarean section, so spinal-induced hypotension must be

addressed to protect the safety of these populations. A significant amount of literature demonstrated that these three evidence-based interventions, both individually and together, significantly reduce the incidence of spinal-induced hypotension in women undergoing an elective cesarean section. Due to the effectiveness of these interventions in the literature, it is reasonable to implement these interventions in clinical practice to improve maternal and fetal outcomes. Evidence-based recommendations include providing IV ondansetron 5-10 minutes prior to the initiation of spinal anesthesia, initiating a titratable phenylephrine infusion started at a rate of 35 mcg/min, and co-loading one liter of crystalloid IV fluid during spinal placement.

Evidence-Based Practice

Abstract 5

Anesthesia Provider Perioperative Insulin Pump Management Education

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Background/Purpose/Question: The number of patients with insulin pumps presenting for surgery is increasing. However, many anesthesia providers lack experience in managing insulin pumps during surgical procedures. This has resulted in inadequate glucose monitoring, poor glycemic control, and inconsistent documentation of the insulin pump. Inappropriate glucose management can lead to multiple complications such as increased risk of infection and poor wound healing. The purpose of this project was to ensure safe and standardized perioperative insulin pump management via an educational session for anesthesia staff. The project addressed the following question: “In anesthesia providers, does an educational session on perioperative insulin pump management in patients undergoing surgery improve provider knowledge of anesthesia considerations for perioperative insulin pump management?”

Methods/Evidence Search: A literature search on perioperative insulin pump management was performed in PubMed, Embase, and Scopus. The search utilized the following keywords: insulin pump, diabetes, education, complications, management, and perioperative. Inclusion criteria consisted of patients with diabetes using insulin pumps and surgical procedures. Exclusion criteria included patients without diabetes, nonsurgical procedures, and abstracts not in English. Twelve articles were included. A pre-assessment was developed to evaluate anesthesia providers' baseline knowledge. The pre-assessment contained 15 multiple-choice items addressing complications, interventions, and perioperative management. This instrument was reviewed by an item-writing expert to increase reliability of the assessment. An evidence-based PowerPoint on pump management was presented, followed by administration of an identical post-assessment. The results were compiled using Excel. Bivariate descriptive statistics utilized included mean, median, mode, and percent change to analyze results.

Synthesis of Literature/Results/Discussion: The results from the pre- and post-knowledge assessments indicated the educational session improved providers' knowledge of perioperative insulin pump management. The average pre-assessment score was 65%, which was consistent with previously published work. Wide variations in perioperative insulin pump management, inconsistent documentation, and inadequacy of glucose monitoring are documented in the literature (Mackey et al., 2015) and were also frequently missed questions on the pre-assessment. The educational session yielded a 38% increase in scores and the mean increased from 65% to 90%. Inconsistencies in insulin pump management pose potential safety concerns for patients using insulin pumps. Due to the glycemic response to surgical stress, patients with diabetes are at a higher risk of poor glycemic control. Failure to manage glycemic control is an independent risk factor for adverse outcomes and perioperative complications, such as wound infection and delayed healing (Frisch et al., 2010).

Conclusion/Recommendations for Practice: People with diabetes have a two-times greater chance of requiring surgery than those without diabetes and currently represent 25% of the surgical population (Umpierrez & Klonoff, 2018). For people living with diabetes, the use of insulin infusion pumps is beneficial to manage blood glucose; as a result, the number of patients presenting with pumps is

increasing (Umpierrez & Klonoff, 2018). Despite this, literature shows management of the pumps can vary among anesthesia providers. Documentation and glucose monitoring is inconsistent. This project showed a successful method to address the inconsistencies in practice and improve provider knowledge. Patients with diabetes are at greater risk for perioperative complications. Due to the variations in practice and knowledge gaps identified, future research should focus on continued perioperative insulin pump education and methods to further standardize care such as development of an intraoperative protocol. This could ultimately promote patient safety and help ensure best outcomes for patients.

Quality Improvement

Abstract 9

Implementation of Gamification in the Regional Anesthesia Intensive

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Background: Gamification is defined as the use of game-styled learning methods in non-game contexts, such as simulation-based learning (Malicki et al., 2020). Research illustrates that gamification encourages student participation, increases student learning motivation, and maximizes the amount of information students can retain (Gibiino et al., 2022; Manzano-Leon et al., 2021). Despite sufficient evidence of the benefits of incorporating gamification, the nurse anesthesia program (NAP) did not include gamification learning methods. Internal data from the 2022 Regional Anesthesia Intensive (RAI) supported the need for an innovative approach to improving learning outcomes. The purpose of this quality improvement project was to improve student comprehension of regional anesthesia, motivation in learning, and confidence in performing regional anesthesia through the incorporation of gamification during the June 2023 RAI.

Method: The intervention consisted of a review game to assess student knowledge of regional anesthesia. One game component evaluated critical thinking and tactical skills by requiring competing student teams to determine the appropriate block for a given case study and identify the corresponding anatomy using ultrasound. A second game component utilized a relay race competition to reinforce clinical knowledge. After each game component, the students were given feedback to decrease knowledge gaps and given the opportunity to clarify correct answers. After the intervention, the participants could complete a voluntary Qualtrics survey. The survey used a 7-point Likert scale to discern student motivation, confidence in skills, and knowledge before and after the intervention. The survey also assessed learning techniques and included a free text comments section, allowing students to leave optional qualitative feedback. The survey results were analyzed using descriptive statistical tests.

Results: The Qualtrics survey results included data from 51 (100%) students using a 7-point Likert scale. The gamification intervention was associated with an overall improvement in student experiences during the RAI. Student confidence in performing regional anesthesia improved from a mean of 3.35 (somewhat disagree) before the intervention to 4.8 (somewhat agree) after the intervention, demonstrating a 43.3% increase in confidence. Motivation to learn improved from a mean of 5.73 (somewhat agree) before the intervention to 6.2 (agree) after the intervention, reflecting an 8% increase in motivation. Student self-assessment of knowledge in using ultrasound and performing regional anesthesia improved from a mean of 3.96 (neither agree nor disagree) before the intervention to 5.15 (somewhat agree) after the intervention, reflecting a 30% increase in self-assessment of this knowledge.

Discussion: Similar to the findings of current literature, the survey results demonstrated an increase in post-intervention student knowledge, confidence, and motivation (Gibiino et al., 2022; Manzano-Leon et al., 2021). Fifty-one (100%) participants agreed that receiving immediate feedback improved learning experiences, 96% agreed that teamwork was motivating, and 100% would recommend continuing gamification for future classes. No students entered negative or indifferent qualitative feedback. One student commented, “Learning through activities like these increased participation…. It was a lot of fun

and helps with remembering answers to questions!" Additionally, the faculty course manager reported that they intend to incorporate the gamification intervention in future RAIs. Limitations to this intervention included a small sample size and focus on a single specific topic. Future projects that modify the intervention design for use with more participants and different topics could strengthen support for including gamification in anesthesia curriculums. The future goal for this project is to encourage the incorporation of gamification into other courses in this NAP as well as other institutions to improve student learning and therefore improve CRNA performance in clinical practice. Further research needs to be conducted to determine if these improved outcomes can be correlated to gamification.

Quality Improvement

Abstract 10

Bridging an Education Gap: Ultrasound-Guided Peripheral IVs

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Background: Peripheral intravenous (IV) cannulation classifies as the most universally performed technique in the hospital setting. Ultrasound (US)-guided placement of peripheral IVs ranks as an emerging skill to increase the efficiency and effectiveness of cannulation (Gottlieb et al., 2017). Healthcare providers competent in US usage displayed a 98% success rate in first-attempt IV cannulation while decreasing adverse events. However, the US-guided technique remains underutilized by providers due to lack of education on how to carry out the specialized skill (van Loon et al., 2019; Oliver et al., 2019; Gottlieb et al., 2017). This results in an increased number of IV attempts, increased pain experienced by the patient, and overall decreased patient satisfaction (Bahl et al., 2021). The purpose of this project was to effectively train Certified Registered Nurse Anesthetists (CRNAs) at an affiliate hospital of a large academic medical center in the Southeast in the utilization of US technology to increase confidence and success in US-guided IV insertion.

Method: A video-instructed presentation was provided to 41 employed CRNAs via the institute's online learning platform. The module included ultrasound basics, step-by-step US-guided IV cannulation instructions, and quiz questions. Two in-person, hands-on simulations were conducted to facilitate the tactile skills of US utilization. The hands-on simulations were carried out one week apart. The current standard of practice at the facility and the benefits of US use were discussed with the CRNAs. US-machine basics and demonstration of the US-guided IV insertion process were performed utilizing training blocks. The training blocks simulated veins and allowed insertion of US-guided IVs. Each CRNA at the simulation successfully performed the skill. A list of the number of participants for the hands-on simulation training was collected. An anonymous Likert scale survey was administered to all employed CRNAs to evaluate the educational impact of the US-guided peripheral IV training post-simulation.

Results: Forty CRNAs participated in the education and hands-on portions of the project. All participants received a survey resulting in a total of 15 responses. The results showed a response rate of 43% (N = 40 with 17 responses). Baseline data were collected following the disbursement of the Likert scale survey via an automated data collection software that gave a real-time analysis of results while maintaining the anonymity of all participants. Results of the survey showed that out of the 17 who responded to the survey, 88% felt as though their ultrasound skills and confidence had increased and demonstrated overwhelmingly positive feedback.

Discussion: The authors concluded that CRNAs attain an improved understanding, ability, and confidence using US to place IV catheters after two training sessions. The survey results emphasized the necessity of additional US training so the utilization of US-guided techniques among CRNAs will increase in the future. Further training would allow more CRNAs to acquire and/or maintain their confidence and ability to successfully place peripheral IVs using a US-guided technique. Limitations of the project included a low response rate on the follow-up survey as well as limited time to complete the project. More CRNA participation may have been possible if more time had been allotted. Additionally, few CRNAs reported that they actually used the US for PIV insertion even though they felt more confident

using it. This demonstrated a challenge in learning these specialized skills since US-guided PIV insertion is not a daily skill for CRNAs. This quality improvement project highlighted the need for further provider education regarding US-based techniques, both in formal healthcare provider training and in the workplace. In summation, this quality improvement project detailed one intervention that was successful in improving the educational gap and CRNA confidence with US, but not necessarily its utilization.

Quality Improvement

Abstract 11

Efficacy of Contextual Competency Training for the Multidisciplinary Obstetric Team

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Background: In the United States, the rate of postpartum hemorrhage (PPH) is approximately 3% to 5%. Clinical management of PPH focuses on hemodynamic resuscitation while treating the underlying cause. At our tertiary academic medical center, the increasing PPH rate impacted the need for hemodynamic resuscitation. A Haemobank®(HB) in the labor and delivery unit stores emergency-release blood products and fibrinogen concentrate for on-demand PPH transfusion management. Only authorized personnel can utilize the HB. The Transfusion Medicine Service grants the clinical care team access to the HB after competency training. Laboratory regulations mandate an HB competency assessment on transfusion policies and protocols, but not PPH management. Meanwhile, transfusion management for obstetrical patients is nuanced due to the pathophysiology of PPH. Therefore, an initiative to enhance HB competency training with contextual obstetrical elements was warranted. The aim of this quality-improvement project was to support obstetrical hemodynamic resuscitation training while maintaining institutional workflow compliance.

Method: The incorporation of contextual elements into HB competency training is an iterative process. Continually evaluating the clinician's perspective, practice guidelines, and patient care environment identifies relevant content. Notable topics include the physiological significance of fibrinogen during pregnancy and fibrinogen values predictive of coagulopathy. Additional examples are the preparation of fibrinogen concentrate and the application of viscoelastic testing. For this quality-improvement project, teaching methods ranged from instructional videos and cognitive aids to simulations. The goal was to facilitate contextual HB competency training for all clinicians involved in PPH hemodynamic resuscitation. Each professional cohort, such as CRNAs, designated a facilitator. The method used to assess impact was 1) quantifying the number of competency assessments performed annually, 2) tracking HB transaction data and calculating the percentage of transaction errors over time, and 3) utilizing retroactive data review to guide modifications to prospective training sessions.

Results: Facilitators initially rolled out HB competency training with enhanced contextual elements in October 2020. The quantification of competency assessments commenced on Jan. 1, 2021, and resulted in 111 in 2021, 22 in 2022, and 33 to date in 2023. Retrieving blood products from the HB was standardized, and any deviation from the process was regarded as an error. The percent error rate calculation compared the number of errors to the total number of transactions initiated. The initially high percent error rate for transactions was typical of a growing-pains phase where new workflows require time and practice for providers to gain proficiency. Specifically, the percent error rate reached 50% in March 2020 and 60% in January 2021. Then, as the contextual HB competency training reached a steady state, the percent error rate decreased in March 2022. The reduced rate for errors averaged around 5% to 8%. Of note, the percent error rate still decreased despite an increasing rate of overall HB transactions.

Discussion: At our institution, a high-risk obstetric population contributed to the rising rate of PPH, necessitating prompt access to blood products and fibrinogen concentrate. Meanwhile, the national

shortage of qualified lab technologists for Transfusion Medicine Services led to the closure of our Obstetric Hospital Blood Bank. Increased HB transactions exemplified how access to on-demand products assisted PPH management despite lab technologist staffing shortages. The standardized process for HB product removal incorporated stepwise documentation for quality assurance of the subsequent transfusion intervention with inherent risk. Data analysis indicated that most transactional errors were related to the documentation component, not the physical removal of the HB products. The Transfusion Medical Service must reconcile documentation errors, thereby preventing lab technologists from serving other clinical requests and exacerbating the impact of staffing shortage on patient care. In the future, a centralized intervention would standardize facilitation to emphasize documentation. Another limitation of the decentralized competency facilitation compounded by a dynamic staffing model was that there was no identifiable point for training saturation. Overall, contextual HB competency training effectively supported clinicians in PPH management while maintaining institutional workflow compliance.

Quality Improvement

Abstract 12

Impact of a Pre-admission Seminar on Nurse Anesthesia Program Applicants' Confidence and Preparedness for Graduate Study

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Background: By 2030, a 12% increase in Certified Registered Nurse Anesthetists (CRNAs) entering the workforce will be needed to meet the growing demands on healthcare. In 2020, data from the American Association of Nurse Anesthesiology (AANA) revealed that the average age of CRNAs exceeded 50 years with 13.4% surpassing the conventional retirement age of 65, signaling a considerable upcoming wave of retirements. These data signify that there is a critical demand for qualified CRNA graduates, and interventions are needed to better recruit and prepare applicants for entry into graduate study. Post-baccalaureate preparation programs have been shown to effectively prepare students for the graduate school application process, promote matriculation and academic achievement, and increase individual self-efficacy. Therefore, this project examined the effects of a pre-admission seminar on the confidence and preparedness of prospective nurse anesthesia program (NAP) applicants.

Method: A total of 57 registered nurses attended a one-day, pre-admission seminar on the nurse anesthesia profession and NAP admissions process. Seminar content included information about minimum admission requirements for applying to an NAP, best practices for interviewing, how to stand out as a candidate, and insight into the daily lives of practicing CRNAs. Attendees also participated in various anesthesia simulations, and attended a student registered nurse anesthetist (SRNA) discussion panel. A pre- and post-assessment survey measured participants' understanding of NAP admissions criteria and assessed their confidence in both applying to and successfully advancing within an NAP. Responses were self-evaluated using a Likert scale (1 = "not at all true" to 4 = "exactly true"). Differences in mean scores were analyzed using the Wilcoxon test, with a *P*-value <.05 signifying statistical significance.

Results: Of the 57 registered nurses who attended the seminar, 52 completed the survey. Participants included 44 females (85%) and 8 males (15%). Half of the participants (50%) fell within the 25-29 age range, while 33% were aged 19-24 years. Among those surveyed, 56% were currently working as registered nurses in the state where the pre-admission seminar was held. Following the conclusion of the seminar, participants reported a greater understanding of NAP admission requirements (3.038 vs. 3.808, *P* <.0001), with a noticeable increase in their knowledge of the resources and strategies necessary for a successful application (2.462 vs 3.423, *P* <.0001). Additionally, participants reported increased confidence in their strength as an applicant (2.519 vs 3.279, *P* <.0001) and an enhanced belief in their ability to progress through and matriculate from an NAP (3.154 vs. 3.712, *P* =.0002). All surveyed questions exhibited statistically significant improvement when comparing pre- and post-seminar results.

Discussion: Overall scores for participants' confidence and preparedness increased after the implementation of the pre-admission seminar. These results highlighted the positive impact of the seminar on participants' readiness and self-assurance in pursuing a career in nurse anesthesia. Results of this study were consistent with those of prior research that investigated preparation programs in other health professions, such as premedical and psychology. Limitations of this study included the absence of

a control group which prevented the establishment of a causal relationship between the seminar and increased scores. Furthermore, the pre- and post-assessment survey questions were researcher-created and not drawn from validated tools. Convenience sampling may also limit the generalizability of the findings to the broader target population. The implementation of a pre-admission seminar has numerous benefits to the nurse anesthesia profession. It has the potential to improve program matriculation, academic success, and student retention, which will combat impending workforce shortages. Further research is needed on the relationship between a pre-admission seminar and enrollment into an NAP.

Quality Improvement

Abstract 13

Improving the Perception and Use of Dexmedetomidine among Anesthesia Providers: A Quality Improvement Project

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Background: The anesthetic practice at an acute-care regional referral center in the Southeast was heavily dependent on using opioids and opioid derivatives alone to provide analgesia. Intraoperative opioid use is associated with negative patient outcomes, such as postoperative nausea and vomiting (PONV), respiratory depression, and persistent postoperative pain. These complications contribute to increased length of stay (LOS) and healthcare costs. Although research demonstrates that adding dexmedetomidine as an anesthetic adjunct leads to reduced opioid-related postoperative complications, many anesthesia providers are not utilizing this medication. The purpose of this quality improvement project was to increase the utilization of dexmedetomidine by anesthesia providers to improve outcomes among spinal and orthopedic surgery patients at this facility through the implementation of an anesthesia training bundle.

Method: A pre-implementation retrospective chart review of 50 orthopedic and spine procedures was used to determine dexmedetomidine utilization. A pre-implementation anonymous online survey was distributed to all Certified Registered Nurse Anesthetists (CRNAs) at this facility to determine baseline perception of dexmedetomidine use, barriers to use, and perception of readiness for practice change. Next, the project team implemented an anesthesia training bundle, including an in-person educational presentation, distribution of the recorded presentation to all CRNAs, reference flyers posted in the lounge, and ongoing support for the utilization of dexmedetomidine by CRNA and project team members championing its use. A post-implementation anonymous online survey was then distributed to all CRNAs at this facility to determine perceptions of education effectiveness and interest in changing practice. Finally, a post-implementation retrospective chart review of 50 orthopedic and spine procedures was used to determine dexmedetomidine utilization.

Results: The results of the staff surveys demonstrated that most CRNAs were amenable to changing their practice and including dexmedetomidine with their anesthetic, as well as their eagerness to learn more. Anonymous qualitative responses identified the lack of availability of dexmedetomidine within the operating rooms (OR) as the major barrier to its use. After receiving education, staff requested dexmedetomidine to be stocked in every OR. This request was approved and implemented during the intervention period. Intraoperative utilization of dexmedetomidine increased by 67% from pre-implementation (9% of cases) to post-implementation (15% of cases). The results of the post-intervention surveys demonstrated that most CRNAs at this facility were open to practice change, willing to include dexmedetomidine as an anesthetic adjunct, and eager to learn more about this newer medication.

Discussion: The project aimed to increase the utilization of dexmedetomidine among CRNAs at this acute-care regional referral center in the Southeast. Dexmedetomidine utilization in the cases reviewed increased from 9% to 15%, resulting in an overall increase of 67%. A future retrospective chart review

with a larger sample size to assess for utilization and patient outcomes is recommended. Many barriers and limitations were encountered during this project, such as a lack of education of the PACU nurses, patients receiving peripheral nerve blocks, and the introduction of a new automated medication dispensing system during the project implementation. Despite these limitations and barriers, the project team successfully increased dexmedetomidine utilization through education, continued support, and stakeholder buy-in. The eagerness and willingness of the staff to learn and accept new evidence-based practices greatly contributed to the success of the intervention. The atmosphere of acceptance enhanced the implementation of the new anesthetic technique and paved the way for future improvement in patient care.

Quantitative Research

Abstract 14

Phosphodiesterase-5 Inhibitor (PDE5I) Use and Intraoperative Hypotension during General Anesthesia: A Non-experimental, Causal-Comparative Retrospective Study

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Introduction: Phosphodiesterase-5 Inhibitors (PDE5I) have become increasingly popular, yet studies exploring the effects of PDE5Is under anesthesia are limited. Erectile dysfunction affects over 30 million men in the United States. In 2020, ~3 million sildenafil prescriptions were filled. The additive vasodilatory effects of inhaled anesthetic agents and PDE5Is can lead to profound intraoperative hypotension resulting in adverse events. The aim of this study was to investigate intraoperative hypotension with PDE5I use. We hypothesized that male patients who use a PDE5I before a general anesthetic are at increased risk of intraoperative hypotension. The primary research question: Are male patients who have an active prescription for a PDE5I more likely to experience hypotension during general anesthesia than males who do not have an active prescription for a PDE5I?

Methods: The study used a non-experimental, causal-comparative retrospective design featuring multiple hospitals from a single healthcare system in the Southeastern United States. A nonprobability convenience sampling method was applied. The inclusion criteria characteristics were patients who underwent elective surgery requiring inhalational general anesthesia during the period from January 2021 until June 30, 2023, male gender, and ≥ 18 years of age (n = 6,361). PDE5I use was measured by whether or not the patient had an active prescription. Intraoperative hypotension was measured based on a systolic blood pressure percentage change from baseline up to 30%. Sociodemographics of patients were described as proportions or means with standard deviation as appropriate. Comparison of proportions among groups was examined using the chi-square test or Fisher's exact test. The student's independent sample t-test was used for continuous variables, and the Spearman rank-order correlation coefficient test was used for categorical ordinal variables.

Results: The sample contained 683 patients who had an active prescription for a PDE5I and 5,678 patients who did not have an active prescription for a PDE5I. Among the patients with an active PDE5I prescription, ~70% had hypertension and ~50% took two or more antihypertensives daily. There was a statistically significant result between patients with an active prescription of a PDE5I and an intraoperative decrease in systolic blood pressure (SBP) ≥ 20% from baseline and ≥ 30% from baseline.

Discussion/Conclusion: Overall, male patients who have an active prescription for a PDE5I and undergo general anesthesia experience more hypotension than male patients who do not have an active prescription. In the study sample, the patients with an active prescription also experienced greater degrees of hypotension at 20% and at 30% from the SBP baseline. These results were statistically significant with a $P < 0.05$, as tested by the chi-square and Fisher's exact tests. The data further showed that 70% of the patients with an active prescription for a PDE5I had hypertension, putting this population at an increased risk of detrimental effects from intraoperative hypotension. In a healthy myocardium, the cardiovascular system autoregulates mean arterial pressures between 50-120 mmHg. The autoregulation curve shifts to the right in patients with hypertension, requiring higher pressures to maintain perfusion. Limitations of the study include the inherent threat to internal validity of selection

bias from using a nonprobability, convenience sample. The data obtained from chart reviews were limited to the information collected from the perioperative multidisciplinary team, and information pertinent to this study's aim may not have been reported. A recommendation for future research is to conduct experimental studies that compare male patients who take a PDE5I before undergoing general anesthesia to male patients who do not take a PDE5I before undergoing general anesthesia.

Quantitative Research

Abstract 15

Nurse Anesthesia Program Administrator Assessment

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Introduction: Nurse anesthetists are the first advanced practice nursing specialty to require a practice doctorate for entry to practice. Doctoral programs necessitate intense faculty mentoring and support, which increases faculty workload. Practice doctorate faculty report less personal scholarship activity and more frequent engagement in clinical practice. The scholarly productivity, academic rank, and tenure status of faculty in pharmaceutical and physical therapy programs vary, as evidenced in the literature, but no such data were identified regarding nurse anesthesia faculty.

Methods: Nurse anesthesia program directors (PD) and associate program directors (APD) from all 121 programs (*n* = 242) were surveyed by mail. A 24-item survey instrument was adapted and content validity was confirmed. PD and APD demographic and employment characteristics were quantified as well as methods and frequency of scholarship and barriers to scholarly productivity. Seventy-eight percent reported engagement in clinical practice. Data were self-reported and collected during the COVID pandemic.

Results: The response rate was 43.3%. PD and APD demographic and employment characteristics were quantified. Seventy-five percent of PDs and APDs reported no refereed research presentations over the prior three years; however, 52.3% reported publication of a peer-reviewed manuscript during the same time period. Seventy-eight percent reported engagement in clinical practice. Time constraints were reported as the most significant impediment to scholarly productivity.

Discussion/Conclusion: The response rate was 43.3%. PD and APD demographic and employment characteristics were quantified as well as methods and frequency of scholarship and barriers to scholarly productivity. Seventy-eight percent reported engagement in clinical practice. Time constraints were reported as the most significant impediment to scholarly productivity and the associated advancement in academic rank and tenure. Surveys were mailed. Data were self-reported and collected during the COVID pandemic. Wide institutional variations in faculty roles, titles, and ranks exist but were not assessed in this study. Results suggest that nurse anesthesia PD and APD roles are similar to those in other healthcare specialties with clinical doctorate programs. Clinical practice is prioritized but may limit scholarly work. Defining a balanced role for clinical doctorate faculty may help recruit and retain faculty and best manage the increased number of clinical doctoral students, as well as aid other advanced practice nursing specialties considering a clinical doctorate as entry-to-practice.

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