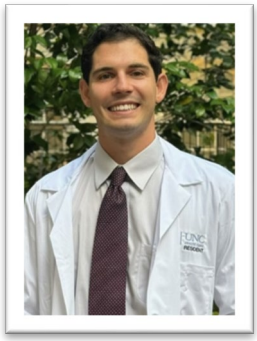
UNC | SCHOOL OF MEDICINE
Anesthesiology

Academic Medicine Rotation Symposium

December 18th, 2024

7:00 AM – 8:00 AM
Bondurant G100
Breakfast is Provided

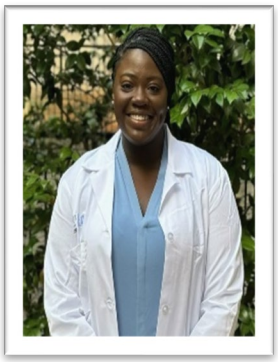


Andrew Blake

Michael Conti

Andrew Delahunty

Kaitlyn Freels

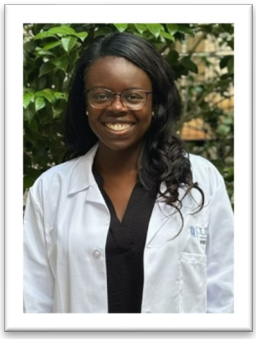


Clara Joseph

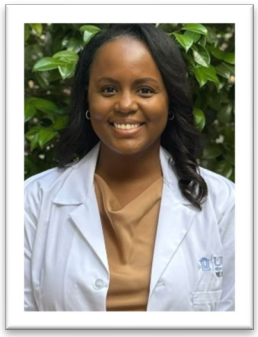
Brenna Katz

Resha Kodali

Andrew Monick

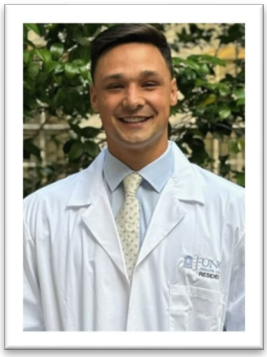


ChrisTina Okolo



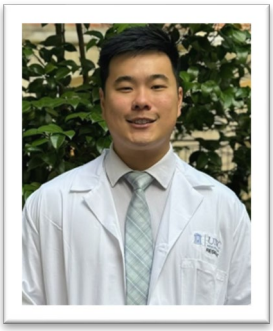
Latiffa Smith

Ashley Stewart



Elijah Strong

Kevin Welch



Richard Zhao

Program

Introduction: Benjamin Cobb, MD

Presentations:

Seal the Deal: Pre-Splitting BOugie Packages for Difficult Airway Management

Andrew Blake, MD **(Mentors: James Williams, MD)**

Needle Meets Vessel: Assessment of a flipped classroom model demonstrating real-time neddle tip observed ultrasound guided vascular access

Michael Conti, MD **(Mentor: Shawn Jia, MD)**

Have We MET? Evaluating Anesthesiology Provider Knowledge of Metabolic Equivalents

Andrew Delahunty, MD **(Mentor: Emily Teeter, MD)**

LEADing the Way: Radiation Safety for Anesthesiology Residents

Kaitlyn Freels, MD **(Mentor: Adam Suchar, MD)**

Perception of Perioperative Resuscitation and Life Support

Clara Joseph, MD **(Mentors: Benjamin Cobb, MD & Robert Isaak, MD)**

Epic-durals: Standaridizing Intraoperative Management of Thoracic Epidurals

Brenna Katz MD **(Mentor: Dominika James, MD)**

Freeze Tag: Chasing the Pre-Paralytic Start Up Sequence Via Senzime Tetragraph

Resha Kodali, MD **(Mentor: Sally Stander, MD)**

Saying No to Nocebo - An Educational Intervention

Andrew Monick, MD **(Mentor: Joseph Sisk, MD)**

The Flick of the Wrist: Does the use of an arm board in arterial line insertion lead to efficiency in placement of radial arterial lines?

ChrisTina Okolo, MD **(Mentor: Daniel Rosenkrans, MD)**

“Seal the Deal: Pre-Splitting Bougie Packages for Difficult Airway Management”

Andrew Blake MD, James Williams, MD

Background:

The ASA Difficult Airway Algorithm includes use of a soft silastic bougie to supplement laryngoscopy and intubation1. This can serve as a potentially life-saving tool to assist with airway management during an emergency, with studies demonstrating that Bougies improve first-pass success rates in challenging intubations234. However, some anesthesiology providers have noted subjective difficulties in opening the Bougie package to access the tool. This allows for delays in care and may contribute to prolonged hypoxia in patients with a compromised airway, as well as increased provider anxiety5. This quality improvement project aims first to estimate average duration needed to open the Bougie packaging. It will then analyze anesthesiology providers’ comfort and practice associated with Bougie use before and after providing an educational summary and proposed solution regarding Bougie access.

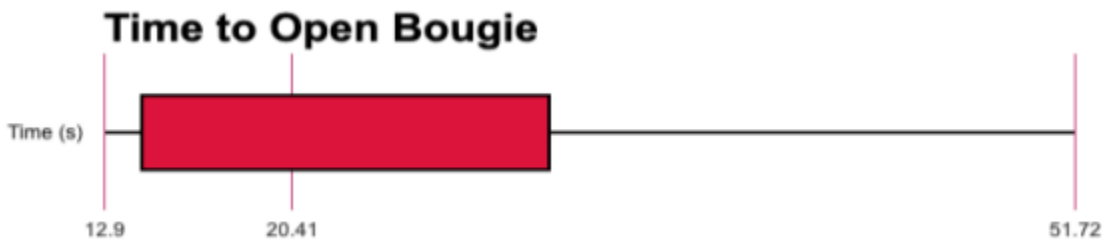
Methods:

First, 14 anesthesiology trainees were timed to determine average duration needed to open Bougie packaging. Subjects were first instructed to wear appropriately sized wear nitrile gloves. Subjects then placed .09oz of lubricating jelly on their gloves, to mimic the fluids (saliva, emesis, blood) that may be present in an airway emergency. Participants were then timed as they attempted to open the Bougie package and access the tool. The results from this test were summarized into a brief educational summary to inform providers on various data points regarding time needed to open a Bougie package.

Next, a Qualtrics survey was created and distributed to 70 anesthesiology providers at UNC, including attendings, fellows, residents, interns, and CRNAs. Participants first completed a pretest to assess their baseline comfort and practice associated with Bougie use. An educational summary was then provided to inform participants of the previously obtained data regarding time needed to open Bougie packaging. This educational summary also proposed a solution of pre-splitting the Bougie packaging to improve ease and efficiency of Bougie access. A post-test was then performed to assess for a significant change in participants' responses following this educational intervention. The pre- and post-intervention surveys used a 5-point Likert Scale Model. The obtained survey responses were re-categorized into one of two nominal data categories. One category included Strongly Agree/Agree responses, while the other included Neutral/Disagree/Strongly Disagree responses. Statistical analysis was performed with McNamer’s Test to determine if there was significant change in survey responses after participants reviewed the provided educational material.

Results:

After timing 14 participants as they opened the Bougie packaging, the average time needed to access the tool was found to be 24.47s. Times ranged from a minimum of 12.9s to a maximum of 51.72s, with a median time of 20.41s.



Pre- and post-survey data for each individual question was analyzed using McNemar's test. For survey prompt "I am confident in my ability to open a Bougie package in an expedited and efficient manner", there were significantly more Strongly Agree/Agree responses after the educational intervention, with a two-tailed p value of .000011. Similarly, survey prompt "I feel that difficulties with Bougie access could influence patient care during a critical event", and "I am likely to modify the packaging of the Bougie before case start if a challenging airway is predicted" also demonstrated significantly more Strongly Agree/Agree responses after the educational intervention, with two-tailed p values of .0074 and .031, respectively.

Conclusions:

Overall, the survey results suggest that there was a significant number of participants who shifted from "Neutral/Disagree/Strongly Disagree" to "Strongly Agree/Agree" for each survey prompt after reviewing the provided educational and proposed solution of pre-splitting Bougie packaging. This significant result suggests that the educational intervention had a positive impact on the participants' perceived confidence in handling Bougie packaging, awareness that delays in opening Bougie packaging may affect care, and likelihood of pre-splitting the packaging with future Bougie use. Future direction involves analyzing time needed to open pre-split Bougie packaging, and determining if this is significantly different from time needed to open standard Bougie packaging

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Assessment of a flipped classroom model demonstrating real-time needle tip observed ultrasound guided peripheral vascular access

Dr. Michael Conti; Mentor: Dr. Shawn Jia

Academic Medicine Rotation 2024

Introduction:

Successful vascular access is a critical step during patient care to quickly provide anesthetics, fluids, blood products and medications during critical care and other various daily hospital operations. Landmark or palpation-based techniques have been the standard approaches, but may be limited by operator skill, vessel size, and patient factors. Real-time ultrasound (US) guidance visualizing needle tip vasculature access has increasingly become more prevalent.1 US for vascular access has been shown to increase success rates from 60% to 90% in patients with difficult veins.1 US has additionally been shown to reduce hematoma and unintentional arterial puncture complications.2,3 Increasingly, medical centers have developed training, and journals have emphasized standardized training.3,4 The goal of this quality improvement (QI) project was to assess if a standardized flipped classroom workshop increases ability, comfort and knowledge compared to the current method of independent study and experiential learning gained during intern year.

Methods:

A 5 question 10-point integer scale pre-intervention survey was distributed electronically with a subsequent link to a 15-minute free New England Journal of Medicine video demonstrating real-time US needle tip guided vascular access to the UNC anesthesia intern class. The pre-intervention survey assessed the intern's ability, comfort and knowledge with this technique. The intern class then completed a thirty-minute didactic portion incorporating a demonstration by an in-house staff anesthesiologist expert and getting an attempt to replicate the taught method. A 5 question 10-point integer scale post-intervention electronic survey was distributed to assess changes in their ability, comfort and knowledge. Pre and post survey's additionally asked interns if they viewed US training was applicable beyond performing peripheral vascular access and if this skill set is beneficial during intern year. Results from both surveys were compiled and data was compared using a paired t-test.

Results:

A 100% percent response rate (n=13) was obtained for pre-intervention and post intervention surveys with 100% attendance at the live US didactic workshop. Two-tailed paired two sample t-tests revealed statistically significant improvement for intern ability ($p=0.025$), comfort

(p=0.012), and knowledge (p=0.0069). US technique applicability beyond performing peripheral vascular access displayed similarly high values pre and post intervention survey without statistically significant differences (pre-intervention mean 8.07;

post-intervention mean 8.61; p=0.47). US technique benefit throughout intern year also displayed similarly high values pre and post survey without statistically significant differences (pre-intervention mean 8.15; post-intervention mean 8.54; p= 0.62).

Discussion:

Successful vascular access is a critical component of patient care, with evidence showing that real-time US guided needle tip visualization improves success rates from 60% to 90% in patients with difficult vasculature. Journals highlight the importance of standardized training in this technique. Currently, UNC anesthesiology employs self-study and experiential rotational learning for US-guided peripheral vascular access. The survey indicates a statistically significant improvement in interns' ability, comfort, and knowledge of real-time US needle tip identification for vascular access. The findings suggest broader applicability of this technique beyond peripheral veinous access. Future research will replicate this study at the start of the intern year to expand the sample size and account for variations in prior rotational experience and baseline skills. Incorporating this training into intern orientation could enhance vascular access resources, improve efficiency, increase patient satisfaction and reduce the burden of existing resources throughout the hospital.

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Have We MET? Evaluating Anesthesiology Provider Knowledge of Metabolic Equivalents

Andrew Delahunty MD

Advisor: Emily Teeter, MD

Background:

During the preoperative evaluation, an anesthesiology provider must do their best to evaluate a patient's ability to tolerate the cardiovascular stress of surgery. While there are structured and validated questionnaires that can be used for this purpose--such as the Duke Activity Status Index (DASI)5--many of these preoperative functional assessments are informal and subjective. A common approach for these assessments often relies on simple questions such as "Can you climb two flights of stairs without stopping to catch your breath?" or "Can you walk a couple of city blocks?"3,5. These two questions are most often used because if the patient is able to truthfully answer "yes", the provider can reasonably infer that they can tolerate 4 METs (Metabolic Equivalent of Tasks) of activity and therefore tolerate a non-cardiac surgery based on the former ACC/AHA guidelines2,4. This quality improvement project aims to evaluate anesthesiology providers' understanding and ability to accurately categorize physical activities according to their relative amount of metabolic effort.

Methods:

A 10-item questionnaire was administered to multiple cohorts within the department of anesthesiology including interns, anesthesiology residents, CRNAs/AAs, and attendings to assess their ability to correctly identify activities associated with varying levels of physical exertion. The questionnaire presented a list of common activities, and participants were asked to classify each activity into one of three categories: less than 4 METs, between 4.0 to 6.9 METSs, and greater than 7.0 METs. These activities and their associated METs were identified from the 2024 Compendium of Physical Activity1, published in the Journal of Sport and Health Science. In addition to assessing knowledge, the questionnaire asked respondents to identify their level of training (i.e. attending, resident, etc.) as well as their confidence level when answering the questions. Following the questionnaire, a statistical analysis was performed to evaluate for any significant differences between the various levels of training and knowledge of METs to assess whether educational interventions should take place in the department.

Results:

The primary outcome was measuring either the similarities or differences between the percentage of correct answers regarding the identification of METs for various activities between the various cohorts of anesthesiology providers. Secondary outcomes included measuring either similarities or differences in the self-reported confidence of anesthesiology providers in evaluating the METs these activities. Our results showed no significant difference in percent correct between any resident cohort when compared to any other resident cohort and/or the cohort of attendings. Due to very small response rate from CRNAs and AAs (two total), these results were not included in the statistical analysis. When it came to the secondary outcome of confidence, the intern cohort had significantly lower confidence compared to CA-1's, CA-2's, CA-3's, and attendings. There was no significant difference in confidence level between the CA-1, CA-2, CA-3 and attending cohorts.

Conclusion:

Overall, there was no statistical difference in knowledge of METs based on level of training. However, if this 10-question quiz was subject to a standard academic grading scale (i.e. passing grade >70% correct), then the entire department would be awarded a failing grade as the highest scoring cohort only achieved 56% correct on average with no statistical difference among any of the tested cohorts. Our results suggest that a focused educational intervention should take place for residents and attendings with an emphasis on common activities of daily living with their associated METs. This intervention has the potential to enhance the perioperative risk assessment process by providing anesthesiologists with a broader set of tools to assess functional capacity beyond traditional questions.

References:

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LEADing the Way: Radiation Safety for Anesthesiology Residents

Kaitlyn Freels, MD, Adam Suchar, MD

Introduction:

Occupational radiation exposure is likely to increase in the coming decades for anesthesiology team members, as the use of image-guided procedures becomes more prevalent. According to the International Atomic Energy Agency, these procedures have increased six-fold in the last 12 years (1). Anesthesiologists may be exposed to unsafe doses and should understand radiation safe practices to minimize risk. One study published in Anesthesiology found that radiation exposure to the anesthesiologist in a neurointerventional suite was 3-fold greater than the radiologist (2). Currently, formal teaching of radiation safety practices is not a standardized element of medical education or anesthesiology residency despite the anticipation of radiation exposure potentially throughout their career. Proper use of protective equipment is learned incidentally through on-the-job training and the current practice of residents is unknown. The International Commission on Radiological Protection (ICRP) reports the maximum annual occupational radiation dose is 20 mSv, averaging over 5 years (3). The University of North Carolina (UNC) School of Medicine Radiation Safety Manual recommends wearing a dosimeter when exposure exceeds 10% of the annual limit, which is standard across numerous states (4). Anesthesiology residents at UNC are not provided with dosimeter badges; therefore, exposure is unclear. Some studies report highly variable radiation doses depending on the procedure room set up and techniques of the trainee (1, 5). Lee et al. (2019) found that, of three senior residents in an ERCP room over 3 months, the resident with the highest exposure was the one who performed the most jaw thrusts (1.27 mSv). While reported exposure rates are low compared to the annual allotment stated above, there is growing concern that some radiation induced hazards such as cataract formation or DNA injury may be due to stochastic effects rather than deterministic ones, meaning that the effect may be independent of dose. There is no threshold dose below which cancer induction will not occur. The goal of this study was to identify the current knowledge of basic radiation safety concepts and the current practices (i.e. donning of protective equipment) of anesthesiology residents and to determine if they can be influenced with brief introductory educational intervention.

Materials and Methods:

Residents during their clinical anesthesia years (1-3) at the University of North Carolina Hospital program were included in the study on a volunteer basis. A survey was distributed via email to test baseline basic radiology safety knowledge. Additionally, a Likert scale was used to determine current personal safety practices. After completion of the survey, residents were provided with a brief information sheet (Figure 1). One week later, the survey was sent again to evaluate if the materials improved safety knowledge and/or changed predicted future personal safety practice. The survey responses were anonymous. Therefore, two sets of data (knowledge

and practices, before and after education) were analyzed using unpaired t-tests ($\alpha = 0.05$) assuming equal variances.

Results:

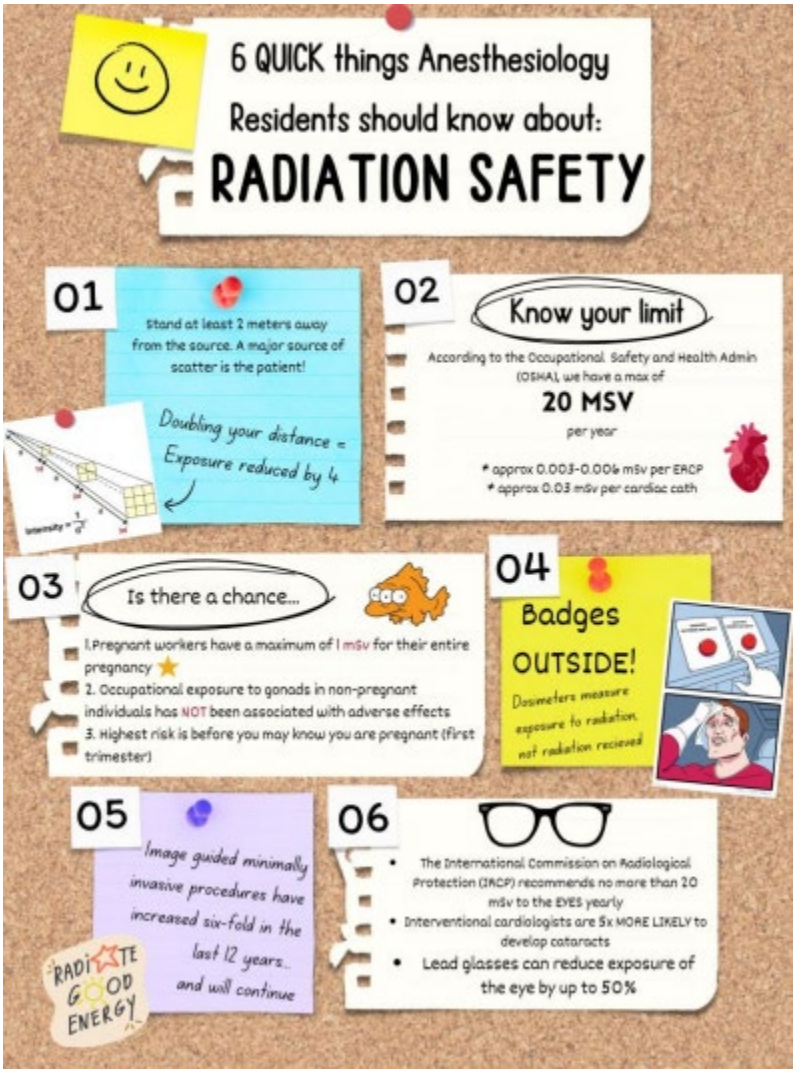
Of the demographics collected in the initial survey (21 participants), representation of gender identity (M 48%, F 52%) and year of training (7 per class) were well distributed. Alternatively, the study is limited by lower participation in the post-education survey (10). The mean score on the pre-test was 48.8%, while the mean score on the post-test was 72.5%. This difference was significant ($p < .039$). More than 90% of participants reported they are “extremely likely” to wear a thyroid shield when exposed to radiation currently, and the information sheet did not significantly improve this ($p = 0.64$). Residents also initially reported they were “somewhat likely” to wear a dosimeter badge if provided with one, and this was not significantly influenced by the information sheet ($p=0.76$). However, residents were more likely to wear radiation glasses in the future after the intervention ($p = 0.008$).

Conclusions:

In this study, brief educational materials were effective in conveying basic concepts of radiation safety. This suggests there is a knowledge gap that could be addressed with formal instruction. While the likelihood of residents wearing dosimeter badges was not influenced by the materials, there was a high likelihood they would wear one if available. This would enhance residents’ personal safety and aid our institution in better defining risk for all members of the anesthesia team. Finally, participants were more likely to wear radiation glasses with better understanding of their benefits. Further investigation could determine if current resources are a barrier to proper eye protection.

Figures

1. Brief Information Sheet provided to residents



Citations

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Perception of Perioperative Resuscitation and Life Support

Clara Joseph, MD; Benjamin Cobb, MD; Robert Isaak, DO

Background: Peri-procedural cardiac arrest (PPCA) often arises from different etiologies than out-of-hospital or hospital floor cardiac arrests, highlighting the need for specialized intraoperative and peri-procedural training for anesthesia providers—training that goes beyond standard Advanced Cardiac Life Support (ACLS) protocols. Some of the causes of PPCA not discussed in ACLS include malignant hyperthermia (MH), massive trauma, and local anesthetic systemic toxicity (LAST), among other factors (McEvoy, Matthew D et al., 2018). In response to these gaps in ACLS, the American Society of Anesthesiologists developed the Perioperative Resuscitation and Life Support (PeRLS) program to better prepare anesthesia providers for these critical emergencies.

Approximately 16 months ago, PeRLS training was introduced to anesthesia providers at UNC Anesthesiology as an alternative to ACLS. Since then, 54 of 216 of the department's anesthesia providers have completed the training.

Methods: To explore why providers had not yet completed the PeRLS training, a educational module and survey was developed to increase anesthesia provider knowledge about PeRLS training and assess their perceptions about PeRLS. The responses were obtained both before and after the educational intervention, which provided additional background information on the topics covered in PeRLS (such as LAST, MH, etc.), the certification and renewal process, the available Continuing Medical Education (CME) credits, and the cost for ASA and non-ASA members (currently funded by the department) (Anesthesia Education Department). The survey also assessed the likelihood of providers to complete the PeRLS training within the next 6 to 12 months, both before and after the educational session.

Results: A total of 80 anesthesia providers participated in the survey, including 43 attendings, 2 fellows, 25 residents, 9 certified registered nurse anesthetists (CRNAs), and 1 anesthesiology assistant (AA). Of the respondents, 53% had completed PeRLS, while 47% had not. Among the participants who had not completed PeRLS (total 38 people), 24 expressed plans to do so in the future. The number of providers intending to complete the training remained unchanged (24) both pre- and post-education. However, the proportion of providers who initially indicated they would not complete the training dropped significantly, from 19 to 4. Additionally, 14 providers remained neutral, neither agreeing nor disagreeing with the likelihood of completion. The most common reported barriers to completing the training included lack of time (10 responses) and uncertainty about how to access the course (7 responses).

Conclusions: While there was no substantial increase in the number of providers intending to complete the PeRLS training within the next 6 to 12 months following the education module, there was a noteworthy decrease in the number of those opposed to

undertaking the course within that period. Raising awareness of PeRLS training among anesthesia providers and offering a centralized access point on the department's website are likely to improve completion rates. PeRLS requires less time than ACLS, with an estimated duration of three to five hours (without the need for an in-person component), compared to the six hours required for ACLS, which includes an in-person session. By fostering a deeper understanding of PeRLS training, anesthesia providers will be better equipped to manage peri-procedural emergencies

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Epic-durals: Standardizing Intraoperative Management of Epidurals

Brenna Katz, MD; Dominika James, MD

Introduction

Acute Pain Services (APS) play a vital role in perioperative pain management, promoting recovery and enhancing surgical outcomes. These multidisciplinary teams focus on evidence-based approaches such as regional anesthesia and systemic analgesics to minimize pain, reduce opioid use, and mitigate side effects, resulting in faster recovery and improved patient satisfaction. Epidural analgesia, a cornerstone of APS, involves placing a catheter in the epidural space to deliver local anesthetics, often combined with opioids. This technique provides superior pain control by blocking pain transmission at the spinal level and is especially beneficial for thoracic and upper abdominal surgeries. Thoracic epidurals reduce the surgical stress response, improve respiratory function, and lower postoperative complication rates such as pulmonary infections and ileus (1,2). At UNC, APS protocol for intraoperative management of thoracic epidurals includes initiating 0.25% bupivacaine infusion and bolusing hydromorphone 0.4 mg epidurally at the start of surgery, and transitioning to a lower concentration of bupivacaine plus opioid infusion postoperatively. These standardized practices ensure consistency and optimize pain management. While epidural use varies depending on the type of surgery and individual patient needs, APS emphasizes protocols that align with best practices. To evaluate and enhance staff knowledge on epidural management, we conducted a quality improvement project. This project assessed baseline knowledge among anesthesiology staff before introducing an educational intervention designed to standardize and improve practices.

Methods

This quality improvement project was conducted over two-weeks and assessed the impact of an educational intervention on knowledge about continuous thoracic epidural management among anesthesia providers, including residents, CRNAs, and attendings. A three-question questionnaire was distributed electronically to participants one week prior to the intervention to establish baseline knowledge on epidural techniques and safe bolus practices. A week later, an educational tool developed with the APS, including an instructional document, was distributed alongside the same questionnaire. Responses from the pre- and post-intervention questionnaires were collected and compared to evaluate changes in knowledge. Pre-intervention and post-intervention scores were compared using chi-squared analysis.

Results

Seventy-nine participants completed the pre-intervention questionnaire while fifty-five participants completed the post-intervention questionnaire. Prior to educational intervention, 33 out of 79 (42%) participants were familiar with UNC APS guidelines for intraoperative management of thoracic epidurals, and 46 out of 79 (58%) participants were not. Following intervention, 47 out of 55 (94%) participants were familiar with UNC APS guidelines for intraoperative management of thoracic epidurals, and 8 out of 55 (16%) participants were not. There was a statistically significant difference in pre and post intervention in familiarity with UNC APS guidelines ($p<0.0001$, chi-square=25.718).

Conclusions

For this study, we assessed the anesthesia team's familiarity with UNC APS guidelines regarding epidural use before and after introducing an educational tool. Providing an educational tool led to a statistically significant increase in awareness of epidural protocol. While multiple methods exist for safely managing epidurals, the educational tool ensured consistency in using best practices per UNC APS guidelines. Study limitations included a small sample size and a brief timeframe. Future directions could involve integrating the educational tool into the APS cart to increase accessibility and reinforce learning.

Resources:

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Freeze Tag: Chasing the Pre-Paralytic Start Up Sequence Via Senzime TetragraphÒ

Resha Kodali MD, Sally Stander MD

Introduction

Postoperative residual neuromuscular blockade is a common adverse outcome associated with neuromuscular blocking drugs (NMBDs), occurring in at least 30% of cases.1 It can lead to many complications including aspiration secondary to pharyngeal dysfunction, respiratory failure, and pneumonia. There are three types of methods commonly used to assess recovery of paralysis: clinical observation, qualitative monitoring, and quantitative monitoring. 1 The ASA recommends against clinical observation (i.e. spontaneous respiratory efforts or tidal volumes) as the sole assessment of neuromuscular blockade given its lack of sensitivity. 2 Qualitative and quantitative monitoring both yield an objective measurement known as the train of four (TOF) ratio. However, qualitative monitoring requires subjective assessment of muscle twitches and is prone to variation while quantitative monitoring uses sensors to precisely calculate muscle response. As a result, the ASA recommends the use of quantitative monitoring over qualitative monitoring as a measure of neuromuscular blockade to reduce the risk of postoperative residual neuromuscular blockade. 2 At UNCH, quantitative TOF monitoring is provided by the Senzime Tetragraphâ. This device uses EMG to measure neuromuscular blockade by calculating the compound motor action potential (CMAP). Senzime recommends completion of a startup sequence with the Tetragraphâ to obtain a patient-specific supramaximal stimulus and to assess the signal strength prior to administration of any NMBD. The aim of this quality improvement study was to first evaluate how frequently UNC Hospital (UNCH) anesthesia care team providers were practicing this startup sequence as recommended by Senzime and then encourage providers to incorporate the startup sequence in their pre-induction routines.

Methods

This study was completed at UNCH over the course of a 2-week period. A survey was sent to 295 anesthesia care team providers comprised of residents, attendings, CRNAs, and AAs employed at UNCH. Participants were each asked to reflect on their experience in the North Carolina Surgical Hospital operating rooms for the three preceding weeks and characterize their utilization of pre-NMBD TOF monitoring via Senzime Tetragraphâ. A 5-point Likert Scale was provided to quantify frequency with the following options: Always (100%), Often (75-99%), Sometimes (50-75%), Seldom (25-50%), and Rarely (0-25%). After responses were collected, the intervention was then implemented, consisting of 1. placement of the Senzime Tetragraphâ cord alongside traditional monitor (EKG, pulse oximeter, etc.) cords by anesthesia technicians during set up in all North Carolina Surgical Hospital operating rooms and 2. an educational email sent to all 295 subjects discussing Senzime's recommendation to complete a pre-paralytic startup sequence. Both interventions were implemented on the same day, and a post-intervention survey was sent one week later asking participants to reflect on their cases over the preceding one week during which the intervention was in place. Responses from the pre- and post- intervention surveys were grouped (Always + Often ; Sometimes + Seldom + Rarely) and compared using Chi-squared analysis.

Results

80 responses were received for pre-intervention survey, and 42 responses were received for the post-intervention survey. Prior to intervention, 35 (44%) participants indicated they use the Senzime Tetragraphâ prior to administration of paralytic in ³75% of cases. One week after intervention was implemented, 20 (47%) participants indicated pre-paralytic TOF monitoring in ³75% cases. There was no statistically significant difference in frequencies between pre- and post-intervention (P= 0.6837, Chi-squared analysis, a < 0.05).

Conclusion

TOF monitoring is a tool used by anesthesia care team providers to guide their dosing or reversal of NMBDs. As recommended by the ASA, there is a movement that favors the use of quantitative over qualitative monitoring. The Senzime Tetragraphâ is our institution's chosen quantitative TOF monitoring device and is often used for the first time toward the end of a case when extubation is imminent. However, during this phase of the case, there is often little time to troubleshoot the equipment if the electrode placement or signal strength are suboptimal, and providers will often resort to qualitative monitoring to guide extubation readiness. As a result, it is advised that a startup sequence be completed with the Tetragraphâ prior to the first dose of paralytic when there is theoretically more time to troubleshoot malfunctions, thus limiting the instances of providers resorting to qualitative measures in times of necessity. The data showed that one week of intervention failed to promote the implementation of Senzime Tetragraphâ prior to administration of paralytic. We suspect barriers to the success of the interventions include limited reach of the educational email, inconsistencies in the room set-up adjustments given the muscle memory of the anesthesia technicians, and transient study period. As a result, there is an opportunity for future quality improvement projects to promote the use of quantitative monitoring with more robust and permanent interventions.

Resources

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No to Nocebo – An Educational Intervention

Andrew Monick, MD; Joseph Sisk, MD

Introduction

The language that physicians choose when speaking with patients influences their perceptions and expectations. In the context of mask induction, well-intentioned but negatively-valent language may increase stress and anticipatory anxiety surrounding the procedure. The nocebo effect refers to the non-pharmacologic, undesirable consequences of a medical intervention.(1) Children commonly report high levels of anxiety prior to induction of anesthesia,(2) and fear appears to potentiate the nocebo effect.(3) Perioperative anxiety, beyond its contribution to subjective distress, affects outcomes in pediatric populations.(4) The goal of this quality improvement project is to educate pediatric anesthesiologists about the nocebo effect and provide recommendations surrounding language choice during mask induction.

Methods

Our population was board-certified pediatric attending anesthesiologists, pediatric anesthesiology fellows, anesthesiology residents, and pediatric CRNAs at the University of North Carolina. We sent an email containing information about the nocebo effect to this group. We also posted informational flyers in prominent locations around physician workspaces and the pediatric pre-operative workspace. We distributed an electronic survey to assess understanding of the nocebo effect and intent to use nocebo-avoidant language in the operating room using a retrospective, pre-post study design.

Results

28 providers responded to our survey. Paired, two-tailed t testing revealed a statistically significant difference between level of understanding of the nocebo effect before and after our educational intervention ($t = 2.07$, $p < .001$). 96% of participants reported an increased likelihood of using nocebo-avoidant language during induction of anesthesia.

Conclusion

Our intervention was successful in raising awareness of and providing teaching surrounding the nocebo effect. Future directions include broadening this effort to other members of the anesthesia care team and validating the effect of an intervention among pediatric patients.

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The Flick of the Wrist: Does the use of an arm board in arterial line insertion lead to efficiency in placement of radial arterial lines?

ChrisTina Okolo, MD, Daniel Rosenkrans, MD

Introduction:

Arterial lines are placed by anesthesiologists in the operating rooms and intensive care units for continuous blood pressure and hemodynamic monitoring, as well as frequent blood sampling. Insertion of a radial arterial line is an invasive procedure requiring proper wrist positioning for optimal placement. Studies indicate that a wrist extension of 45 degrees is ideal because it increases radial artery height, allowing for the optimal target. Cannulation time is also significantly shorter at 45 degrees wrist extension. At UNC, providers have various methods of wrist positioning for cannulation of the radial artery, including using an arm board, rolled 4x4s, or washcloths underneath the wrist. This project aims to measure the efficiency of arterial line placement with and without using an arm board to determine if arm boards provide benefits and faster placement of arterial lines.

Methods:

A survey was conducted amongst anesthesia providers to gauge preferences, benefits, ease of use, and overall thoughts on efficiency regarding the utilization of the arm board provided by UNC. Patients undergoing elective CABG or valve replacement surgeries were randomly assigned to two groups for two weeks. The control group had arterial lines placed without using an arm board, while the intervention group had arterial lines placed with an arm board. Efficiency was measured by the total time it took to place the arterial line from the time the arterial line kit was opened until a waveform was achieved on the monitor. A two-sample t-test was performed to compare the time it took for arterial line insertion between the two groups. A descriptive statistics analysis was performed for the control group and intervention group separately to determine the average time for arterial line insertion.

Results:

There were 71 responses to the survey, which were composed of attendings, residents, nurse practitioners, and CRNAs. 45% of respondents reported always using an arm board when placing arterial lines, followed by 38% reporting frequent use. 77% of respondents reported that using the arm board makes the procedure process efficient, while 17% reported that it does not. There were 4 patients in the control group and 3 patients in the intervention group. For the control group the average time for arterial line insertion was M = 259 seconds (SD = 42

sec). For the intervention group the average time for arterial line insertion was M = 203 seconds (SD = 20 sec). There was no statistically significant difference in radial arterial line cannulation efficiency (P = 0.19, two-sample t-test) between the two groups.

Conclusion:

The insertion of arterial lines is a critical skill that anesthesiologists perform to monitor patient hemodynamics. At UNC, arm boards are used for positioning of the wrist for this procedure. Based on this quality improvement project, there was no statistically significant difference in the

efficiency of arterial line placement when arm boards were used compared to when they were not; however, results indicated that on average, successful arterial line cannulation was achieved faster with the use of an arm board as compared to no use of an arm board.

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“Dub the Glove: Investigating the Adoption of the Double Glove Technique During Intubation to Prevent Oral Contamination of the Anesthesia Workspace”

Latiffa Smith, MD, & Adam Suchar, MD

Introduction:

Oral contamination in the operating room following intubation is a frequent occurrence and poses a risk of infection to both patients and healthcare personnel. Specifically, upper respiratory secretions and bloodborne pathogens have been directly associated with the contamination of the anesthesia workspace (AW). Gloves used during intubation serve as vectors for contaminating critical items within the AW, including the anesthesia machine, computer keyboards, IV tubing, and other equipment. Bacterial contamination of the AW has been identified as a root cause of 30-day postoperative health care associated infections aPecting approximately 16% of all surgical patients. 1 It has demonstrated that anesthesia providers alone have the capability to reduce contamination within the operating room by four-fold with the implementation of a double gloving technique.2 The double gloving technique entails the anesthesia provider to don a single pair of gloves and an extra glove on the right hand, induce, use the scissor technique with right hand to manipulate the patient’s airway, insert advanced airway, sheath contaminated laryngoscope blade inside of outer right glove, and interact with AW with clean inner right glove. Although double gloving on induction is an infection prevention guideline of the American Society of Anesthesiologists (ASA) and the American Association of Nurse Anesthesiologists (AANA) there is currently no guideline or formal education addressing double gloving on induction within our organization. Despite its proven ePicacy, the double gloving method remains underutilized by many anesthesia providers. This study aims to evaluate the adoption of the double gloving technique among residents and CRNAs.

Methods:

Anesthesiology residents in their second through fourth years and CRNAs were administered a pre-survey containing declarative statements regarding their knowledge of the double gloving technique for preventing oral contamination, their understanding of the proper method for double gloving, their history of formal training in the technique, and whether they had received an educational video on the subject. Upon completion of the pre-survey, participants were provided with an educational video on the double gloving technique. Following the video, they completed a post-survey that evaluated their comfort level with the double gloving method and their likelihood of incorporating the technique into their future practice. The pre-survey and post-survey each utilized a 10-point scale ranging from strongly disagree (1) to strongly agree (10).

Results:

A total of 48 participants completed the pre-survey, while 20 participants completed the post-survey. The mean scores assessing knowledge of the double-glove technique ranged from 2.45 to 7.2, with the CA1 cohort scoring 2.45 and the CRNA cohort scoring 7.2. Standard deviations for each group ranged from 1.5 to 2.5. When evaluating each cohort's knowledge regarding the impact of double gloving on infection reduction, the mean scores ranged from 4.7 to 7, with the CA1 cohort scoring 4.7 and the CRNA cohort scoring 7. In terms of formal training in the double-glove technique, the mean scores ranged from 1.36 to 4.4, with the CA2 cohort scoring 1.36 (SD= 1.2) and the CRNA cohort scoring 4.4 (SD = 3.37). 21 participants completed the post-survey. The mean rating for the perceived benefit of the educational video was 8.86, with 10 representing the highest level of perceived benefit. Regarding the likelihood of incorporating the double-glove technique into future practice, the mean rating was 7.76, with 10 indicating the greatest likelihood of adoption in future practice.

Conclusion:

Overall, the study revealed that a significant number of anesthesia providers were initially unaware of the ePectiveness of double gloving and the potential risks associated with using a single glove method, particularly in relation to increased infection risk. The results of this study indicate that while there is variability in knowledge and formal training regarding the double gloving technique among anesthesia providers, the educational intervention significantly improved participants' understanding and perceived benefit of the method. The high perceived value of the educational video and the increased likelihood of adopting the double gloving technique in future practice suggest that targeted educational ePorts could enhance the utilization of this proven strategy for reducing oral contamination in the operating room. The implementation of a double-gloving technique to reduce anesthesia workspace contamination allows anesthesia providers to protect both patients and providers from harm. Further studies are needed to evaluate long-term adherence to the technique and its extended impact on infection rates within the anesthesia workspace.

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Keeping it Cool: Does Refrigerating Bicitra Improve its Palatability in Cesarean Section Patients?

Ashley Stewart, DO; Jennifer Tripi, MD; Ben Cobb, MD; Lindsey Gouker, MD

Introduction:

Physiologic and anatomic changes during pregnancy increase the risk of pulmonary aspiration during anesthesia.1 The American Society of Anesthesiologists (ASA) Practice Guidelines for Obstetric Anesthesia recommend administration of nonparticulate antacids to neutralize gastric hydrochloric acid prior to cesarean delivery.2 At many institutions, including UNC Medical Center, sodium citrate (Bicitra) is routinely administered for this purpose. However, Bicitra's sour and unpleasant taste frequently results in nausea, vomiting, non-compliance, and overall poor patient satisfaction.3 This quality improvement project aims to evaluate whether chilling Bicitra can enhance its palatability, improve its ease of consumption, and increase patient satisfaction among scheduled cesarean section patients.

Methods:

This quality improvement project was conducted over two weeks in the Labor and Delivery Unit at UNC Medical Center. In the first week, patients scheduled for elective cesarean section deliveries received the standard room-temperature (20°C) Bicitra, while patients undergoing the same procedure in the second week received chilled (4°C) Bicitra. After ingesting the medication pre-induction, both groups completed a standardized 5-question survey to evaluate their perceptions of taste, ease of consumption, lingering taste, incidence of nausea, and willingness to take the medication again in the future. Responses were recorded using a Likert scale (1 = strongly dislike, 5 = strongly like). To maintain objectivity, surveys were conducted exclusively by anesthesia providers who were instructed to use non-biased language when administering the Bicitra and collecting patient feedback. Statistical analysis, including unpaired t-test and chi-square analysis, was used to evaluate differences and determine statistical significance between the two groups.

Results:

Fourteen surveys were completed, with seven participants in each group. To assess differences in taste between chilled and room-temperature Bicitra, an unpaired t-test was preformed to compare average Likert scale ratings (1 = strongly dislike, 5 = strongly like). The chilled Bicitra group had a lower average palatability score (1.57 ± 0.79) in comparison to the room-temperature group (1.86 ± 0.69), though this difference was not statistically significant ($p = 0.48$). Regarding ease of consumption, 57% of patients in the chilled Bicitra group found it easy

to take, compared to 43% in the room-temperature Bicitra group. However, this difference was also not statistically significant (X2 (2, N = 14) = 0.22, p = .89). Similarly, there was no statistical significance in the duration of lingering taste between the groups (X2 (2, N = 14) = 1.17, p = .59). Notably, 100% of patients in both groups reported Bicitra did not cause nausea and all would be willing to take it again, if given the choice.

Conclusion:

This study suggests that refrigerating Bicitra does not significantly alter its sour taste or improve overall palatability in patients undergoing scheduled cesarean deliveries. Although the small sample size limits the generalizability of these findings, the data indicates that chilled Bicitra may improve ease of ingestion, potentially enhancing patient experience for L&D patients at UNCMC. This simple, cost-free adjustment in the current storage of Bicitra has the potential to positively impact patient satisfaction. Further research on this topic is therefore warranted to explore this intervention's effect in a larger patient population and better assess its feasibility for clinical implementation.

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From Heart to Chart: Streamlining Handoffs from the Cardiac OR to CTCCU

Elijah Strong, MD & Daniel Rosenkrans, MD

Introduction

Handoffs of patients within the medical setting are key portions of patient care, and such transitions are prone to communication failures and are a leading cause of sentinel events and medical errors.1,2 These adverse outcomes are particularly true in the OR-to-ICU transition, and current literature emphasizes the importance of structured handoff protocols in these settings.1,2 Although the implementation of structured tools such as checklists and protocols improve information transfer and patient safety, they can also be time-intensive, sometimes introducing inefficiencies or redundancies in the handoff process.3,4 These findings highlight the need for balancing thoroughness with operational efficiency.

This project targets the cardiac OR and Cardiothoracic Critical Care Unit (CTCCU) handoff process within the UNC Surgical Hospital (UNCSH), addressing feedback from ICU providers indicating dissatisfaction with the existing handoff tool, the “pink sheet,” citing irrelevant information and inconsistent reporting.. The aim of this project is to streamline the handoff process, reduce redundancy, improve information relevance, enhance ICU team satisfaction, and decrease handoff time.

Methods

This is a pre-and post-intervention quality improvement study. It involved evaluating the current handoff tool ("pink sheet"), gathering feedback on ICU team satisfaction, timing the handoff process, redesigning the tool (the new “blue sheet”), and reassessing outcomes after implementation. The participants include cardiac anesthesia care teams (ACTs), CTCCU intensivists, and CTCCU APPs. Participants who filled out the surveys included the advanced practice providers (APPs) who are routinely involved in cardiac OR to CTICU transitions at the institution. The handoff times were recorded in minutes by the cardiac ACT who staffed the case and who were performing the handoff. The cases chosen to evaluate the handoff tools included all scheduled cases over a seven day (weekdays only) span from December 2nd through the 10th. The first three days of data collection were used to evaluate the current handoff process, with the latter four days dedicated for the assessment of the new handoff tool. Introduction of the edited handoff tool, the “blue sheet,” was the intervention for this project. The handoff tool was redesigned based on feedback and discussion with CTCCU APPs.

The primary outcome included the time required to complete handoffs, measured pre- and post-implementation. Secondary outcomes included staff perceptions of the handoff process,

assessed via a survey comprising four Likert-scale questions with one question dedicated to the assessment of each of the following four metrics: overall satisfaction, efficiency, consistency, and clarity.

Results

Primary Outcomes: Handoff times were recorded from four cases pre-intervention and from six cases after the introduction of the new handoff tool. The mean handoff time decreased from 4.17 minutes pre-implementation to 3.21 minutes post-implementation. A two-sample t-test assuming equal variances revealed no statistically significant difference in handoff time ($p = 0.11$, two-tailed).

Secondary Outcomes: A total of three surveys were completed pre-intervention, and two were completed post-intervention. Staff perceptions of the anesthesia handoff process demonstrated improvements across most domains:

· Question 1 (Overall satisfaction): Pre-intervention, 33% of respondents "strongly agreed" that they were satisfied with the anesthesia handoff process. Post-intervention, this increased to 100%.

· Question 2 (Clarity): Pre-intervention, 33% of respondents "strongly agreed" that the information was structured in an easy-to-follow format. Post-intervention, 100% of respondents "strongly agreed."

· Question 3 (Efficiency): Pre-intervention, 33% of respondents "neither agreed nor disagreed" and 33% "disagreed" that aspects of the handoff were irrelevant to their needs. Post-intervention, 100% "strongly agreed" that some of the information given during handoff was irrelevant to what they need to know.

· Question 4 (Consistency): Pre-intervention, 66% of respondents "strongly disagreed" that the anesthesia handoff consistently failed to report important aspects. Post-intervention, only one of the two surveyees completed this question and likewise “strongly disagreed” to the question.

Conclusion

Although not statistically significant, the edited handoff protocol led to a trend of reduced handoff time and some improvement in staff satisfaction, specifically increased overall satisfaction and clarity. These findings highlight the value of structured protocols in streamlining communication and fostering better collaboration among healthcare providers. A surprising result from the survey was question three, assessing handoff efficiency. The results appear to report increased irrelevance of information with the redesigned tool, while the same respondents also reported increased overall satisfaction. Again, the interpretation of the

surveys is limited by its small sample size. It is possible that the surveryees may have misread/misinterpreted this question, leading to this unexpected outcome. Some other limitations that may impact the general interpretation of all results include variability in surgical case complexity, and potential confounding factors affecting handoff efficiency, such as patient acuity or staffing levels. Additionally, the satisfaction survey results may also be influenced by subjective biases. Overall, these findings are promising, but given the time limitations of this study, further data collection comparing the current handoff tool ("pink sheet") to the redesigned tool ("blue sheet") are recommended.

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Staying Strapped: Hands-free preoxygenation using mask-harnesses

Kevin Welch, MD and Greg Balfanz, MD

Introduction

Preoxygenation is universally recommended before induction of general anesthesia given it's known effectiveness in prolonging safe apnea time. Specifically, preoxygenation increases the functional oxygen reserve and delays desaturation, thus allowing a provider more time to solve a difficult airway scenario and avoid critical hypoxemia.1 Evidence suggests that the duration of adequate pre-oxygenation is 3 minutes to optimize oxygen reserve in our alveolar, arterial, tissue, and venous compartments.2,3 This depends on breathing 100% oxygen at tidal breathing (to denitrogenate our functional residual capacity) without mask leak. However, the time period preceding induction is rather busy for anesthesia providers, making it difficult to

achieve a full three minutes of preoxygenation. Furthermore, unexpected needs often arise during this period (troubleshooting IVs, setting up monitors and airway equipment, patient positioning, administering medications) which interferes with the ability to hold the face mask securely to the patient's face. For this reason, tools such as facemask harnesses have been implemented to allow for hands-free oxygenation in many operating room settings, including various UNC sites. Despite this, the availability and usage of mask-harnesses at UNC's main campus has anecdotally been scant. The purpose of this study was to assess provider satisfaction using black mask-harnesses, and subsequently to determine whether their use affects duration of adequate preoxygenation prior to induction.

Methods

The intervention for this study was randomly providing black mask harnesses to anesthesia providers caring for adult patients undergoing surgical procedures at the UNC Surgical Hospital. The study spanned two weeks between November and December 2024. Providers were asked to use the harnesses throughout their entire preoxygenation prior to induction of anesthesia. They were asked to complete a pre-intervention survey as well as an identical post-intervention survey. These surveys consisted of Likert-style questions on a 5-point scale to assess 1) Perceived ability to provide adequate pre-oxygenation per practice guidelines, 2) Satisfaction with their pre-oxygenation practices, and 3) Importance of preoxygenation for patient safety. The differences for pre- and post-survey means were analyzed using a paired t-test. Furthermore, chart review was performed to compare duration of adequate preoxygenation (which we defined as an $EtCO2 \geq 20$) prior to induction. The mean duration was compared between a historical control group of patients who underwent non-harness preoxygenation in the month of November at UNC Surgical Hospital, and our intervention group.

Results

Our pre-intervention and post-intervention Likert-scale surveys were completed by 11 anesthesia providers implementing our mask-harness preoxygenation intervention strategy. The first question assessed how often a provider perceived they could provide adequate pre-oxygenation on a scale of 1 (Never) to 5 (Always). The intervention resulted in a mean increase of 0.18 Likert scale points ($p = 0.16$ using paired t-test). The second question assessed how satisfied a provider felt pre-oxygenating

a patient on a scale of 1 (Very dissatisfied) to 5 (Very satisfied). The intervention resulted in a mean increase of 0.64 Likert scale points ($p = 0.01$ using paired t-test). The third question assessed agreement with the statement "Adequate pre-oxygenation is important for patient safety" on a scale of 1 (Strongly disagree) to 5 (Strongly agree). All 11/11 providers answered that they "Strongly agree" with this statement. Next, we attempted to extract objective data via chart review regarding the duration of adequate oxygenation provided to a control group and our intervention group. Unfortunately, it was discovered that preprocedural EtCO2 was not

reliable and would therefore not provide meaningful results. Out of our intervention group, only 5/11 had EtCO2 measurements recorded in EPIC prior to the induction timestamp with an average adequate preoxygenation time of 1.27 mins. There was likely considerable inter-provider variability with regards to when the induction timestamp (and induction medication administration) was charted. Thus, historical comparison was not pursued at this time.

Conclusion

This study established that anesthesia providers feel that preoxygenation prior to induction is very important for patient safety. The ability to provide hands-free pre-oxygenation allows providers to tend to any unexpected needs that arise during the pre-induction period. The results of this study also demonstrate that the use of mask-harnesses improves satisfaction with, and potentially the perceived efficacy of, pre-oxygenation practices. Avoiding a leak between the mask and the face is one of the most important factors in effective preoxygenation because it cannot be compensated for by an increased duration of preoxygenation, and minor degrees of leak are hard to appreciate. Future studies may look at whether harnesses improve efficacy of pre-oxygenation via measures such as EtCO2 to evaluate degree of leak and EtO2 to evaluate degree of oxygenation. Furthermore, quality improvement measures such as induction efficiency could be evaluated by measuring the time from "In Room" to induction. This, in conjunction with a cost analysis, would be useful in advocating for more mask-harnesses to be available at UNC. Limitations to our study include small sample size, patients' willingness to wear a mask-harness, and reliability of timestamp charting practices amongst anesthesia providers.

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Call Me… Maybe? – Text-Based Nerve Block Follow-Up

Richard Zhao, MD & Jeremy Armbruster, MD

Introduction

Following ambulatory surgery, anesthesiologists are responsible for contacting patients one day postoperatively to assess the resolution of nerve block effects and evaluate for potential complications. This follow-up process can be time-consuming, and nearly 40% of patients may not be reached on the first phone call attempt. Phone calls for follow-up are inefficient and frequently result in missed connections, leading to suboptimal care and wasted provider time.1 Additionally, patients may require language interpretation during follow-up, further complicating the process and contributing to delays and potential inaccuracies in communication. This highlights the need for a more effective and efficient method of patient follow-up after nerve block procedures, such as text messaging, which may offer improved accessibility and response rates.2

Methods

Patients who received preoperative peripheral nerve blocks at UNCH between 12/2/24 and 12/9/24 were contacted via text message following surgery and discharge in a HIPAA-compliant manner through Doximity. The text contained a link directing patients to a message with a link to a survey that asked standard follow-up questions regarding current pain levels, the time at which the nerve block wore off, and signs of complications. Patient responses were documented in a standard Anesthesia Post-Op Follow-Up Note. Response rates from this group were compared to those of patients who received preoperative peripheral nerve blocks at UNCH between 9/1/24 and 10/1/24, who were contacted via phone call for follow-up.

Results

A total of 29 patients were included in the follow-up study investigating response rates for text versus phone call outreach after peripheral nerve block procedures. Of the 9 patients who received text-based follow-up, 2 (22%) responded, while 12 out of 20 (60%) patients responded to phone call follow-up. There was no statistically significant difference between the two methods of follow-up ($p=0.109$).

Conclusion

Response rates were higher for phone call follow-ups compared to text messages, with phone call responses occurring nearly three times more frequently than text responses. Although the difference was not statistically significant, this trend suggests that patients may be more likely

to engage with follow-up calls than text-based communication. The use of Doximity-based text messaging presents challenges, as the message is only accessible through an initial link sent from an unknown number, leading to lower engagement. In fact, less than half of the patients who were texted even opened the message. Future research is needed to explore the efficacy of text-based follow-up when patients receive the full message and survey link directly, without needing to click on an external link. Additionally, informing patients in advance that they will receive a text for follow-up may further improve response rates.

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AMR 2024 Contributor List

Name	Topic	Affiliation
CA-1s: Dr. Hasty- Peggins & Dr. Catalano	-Review of Previous AMR QI Projects	UNC Anesthesiology
Chris Johnston	-Emotional Intelligence and Leadership	Clinical Skills and Patient Simulation Center (CSPSC) at the University of North Carolina School of Medicine
Confession Session: Dr. Bingham & Dr. Jennings-Davis	- Confession Session	UNC Anesthesiology
Dr. Ben Antonio	-How to Maximize Anesthesia Billing & Profit	UNC Anesthesiology
Dr. Greg Balfanz	-Organizing Effective M&M - MPOG/ASPIRE/Healthcare Database	UNC Anesthesiology
Dr. Kim Blasius	-Team STEPPS	Former UNC Anesthesiology
Dr. Sharon Cannon	- Public Speaking at a High Level	Clinical Professor of Management and Corporate Communication The University of North Carolina at Chapel Hill, Kenan-Flagler Business School
Dr. Fei Chen	-Welcome and Rotation Overview -Review of Previous AMR QI Projects -Project Timeline: Overview of Individual Projects -Review of Study Designs -Abstract Writing Workshop and Brainstorm -Review of Week 1 -Excel Statistics Workshop	UNC Anesthesiology
Dr. Ben Cobb	-Welcome and Rotation Overview -Review of Previous AMR QI Projects	UNC Anesthesiology

	-Project Timeline: Overview of Individual Projects -Leadership Series #1: Kickoff	
Dr. Lindsey Gouker	-Cognitive Base of Professionalism	UNC Anesthesiology
Dr. David Hardman	-Current CRNA/AA Issues -Understanding Anesthesia Billing	UNC Anesthesiology
Dr. Rob Isaak	-OSCE Theory and Introduction to the ABA	UNC Anesthesiology
Dr. Shawn Jia	-Disclosing Peri-Procedural Complications	UNC Anesthesiology
Dr. Moe Lim	-Operating Room Management	UNC Surgery
Dr. Elisa Lund	-How to Plan an Effective Journal Club - Journal Club	UNC Anesthesiology
Dr. Erin Manning	Perioperative Medicine & Changes to the field of Anesthesiology	UNC Anesthesiology?
Dr. Susan Martinelli	-Feedback in Learning and Teaching -Make it Stick -ACGME Survey -Generations Workshop -VR Workshop	UNC Anesthesiology
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Dr. Matt Mauck	-Intro to Anesthesiology Resident Research	UNC Anesthesiology
Dr. David Mayer	-Role of NCSA and Specialty Advocacy -Supporting ASAPAC	UNC Anesthesiology
Beth Moreton	-Asking a Question & Searching for answers: an overview -An Overview of the HSL – Anesthesiology Library Resource Guide	UNC Health Sciences Library
Dr. Bryant Murphy	-Demonstrating Value Outside Clinical Care -The Role of the State Medical Board in Your Career	UNC Anesthesiology

Dr. Kim Nichols	-Evolution of Healthcare Disparities in the US	UNC Anesthesiology
Dr. Anthony Passannante	-Clinical Application of Evidence Based Medicine -Understanding MOCA & Lifelong Learning	UNC Anesthesiology
Dr. Janey Phelps	-Career Advancement	UNC Anesthesiology
Dr. Daniel Rosenkrans	-How Anesthesia Residents are Evaluated? -Dealing with Difficult Colleagues	UNC Anesthesiology
Dr. Ted Sakai	- Welcome Session	UNC Anesthesiology Chair
Dr. Alan Smeltz	-How to Approach Ethical Dilemmas in Medicine	UNC Anesthesiology
Dr. Lacey Straube	-Informed Consent/Discussion of Treatment Options	UNC Anesthesiology
Dr. Robb Wasserman	-OR Structure	UNC Anesthesiology
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