EDUCATING SRNAS ABOUT THE PRACTICE OF LEGALLY DEFENDABLE ANESTHESIA

by

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DNP Capstone Project Approval Form

This is to certify that Peter Steele successfully defended his/her Capstone project entitled: Educating SRNAs about the Practice of Legally Defendable Anesthesia on December 11, 2018.

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Abstract

SRNAs take on a great legal risk as they enter into the field of anesthesia, but their current educational program does not adequately prepare them to practice in a way that limits this risk. The goal of this project was to improve SRNAs’ understanding of how to provide anesthesia care in a manner that is safe and legally defendable. Numerous studies detailing anesthesia closed claims illustrate the need for this intervention, and serve as guidelines for SRNAs to learn from. Piaget’s Genetic Epistemology provides a theoretical framework for the project, as the SRNAs involved received new information and determined how to adjust their schemas, following the theory’s major concept of balancing assimilation and accommodation processes. Data was collected using a quantitative, pretest-posttest format. First- and second-year SRNAs attending the University at Buffalo comprised the sample, and completed an assessment of understanding of legal concepts in anesthesia before and after receiving an educational intervention. Assessment scores were analyzed alongside variables collected using a demographic survey. Statistical analyses included dependent groups t-test and Pearson’s r. Group mean assessment score demonstrated a statistically significant improvement ($t = 4.772, p < .001, CI = 7.206 - 18.339$), suggesting that the project’s primary goal of improving SRNAs’ understanding of how to provide legally defendable anesthesia was achieved. The lack of a statistically significant correlation between demographic variables and assessment scores indicate that the educational intervention can be used effectively for nurses of all ages and levels of prior experience.

Keywords: anesthesia, malpractice, legally defendable, SRNA, Genetic Epistemology
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assessment tool. Despite taking on very different projects, I enjoyed working through this part of my program, and managing common obstacles accompanied by my classmates.
Over the course of caring for a patient, anesthesia providers are tasked with making numerous decisions, such as what medications to administer and what type of anesthetic approach to take. An individual can be found legally responsible if negative patient outcomes can be tied back to an element of the care they provided. One does not have to look far in an anesthesia group to find providers who have spent years working with an attorney on a legal strategy for litigation that they have been pulled into, as a result of a decision they made or action they took or failed to perform.

Healthcare professionals who experience malpractice litigation often continue to be impacted by it years later, because of its traumatic effect on their life. Knowing that one’s actions may have caused a patient’s negative outcome can leave feelings of guilt and depression. Being required to think about such an incident for years while the consequences are sorted out, unsure of how one’s future ability to practice may be impacted prevents an individual from being able to move past these feelings.

A study conducted by Jordan, Quraishi, and Liao (2013) analyzed data from the National Practitioner Data Bank (NPDB), the largest national-level database providing information on medical malpractice claims paid on behalf of a provider. Looking at NPDB data from January 31, 2004 to December 31, 2010, a total of 2,664 anesthesia-related malpractice payments were identified, 369 of which involved CRNAs. While this figure is not enormous in comparison to the total number of CRNAs practicing at the time, it also does not represent all malpractice claims against CRNAs, as the database is limited to paid malpractice claims. In addition to the frequency of claims, the monetary value of malpractice claims can be quite significant, with payments examined for this study ranging from $33,816.70 to $9,550,000.00.
In a separate study by Mello, Chandra, Gawande, and Studdert (2010), that looked more broadly at all medical liability rather than anesthesia specifically, it was estimated that the total cost of the medical liability system annually is $55.6 billion, or 2.4 percent of total health care spending. Another consideration highlighted in this study was the fact that malpractice lawsuits are costly to providers in the form of time away from patient care for legal proceedings, resulting in lost productivity and income.

The code of ethics for CRNAs (American Association of Nurse Anesthetists [AANA], 2013a) identifies “responsibility as a professional” as part of the ethical foundation upon which one should base their practice. CRNAs recognize that in their practice as independently licensed professionals, they are accountable for all of their judgments and actions. Even if a judgment or action leads to patient harm, the CRNA accepts responsibility for it. The AANA statement on CRNA scope of practice (AANA, 2013b) also highlights the role of CRNAs as providers working both autonomously and in collaboration with other providers. Like the code of ethics, the scope of practice specifically mentions the accountability and responsibility of CRNAs for their services and actions. It is evident throughout the AANA professional practice manual that the national organization representing CRNAs acknowledges the principle of accountability for one’s decisions and actions. Recognizing that this concept is a core value of the profession, it is necessary to optimize CRNAs’ and SRNAs’ ability to make appropriate clinical decisions that reflect their understanding of the current scientific knowledge and standards of care, in order to limit the risk of professional accountability turning into malpractice litigation.

**Purpose**

To protect themselves legally, anesthesia providers must make decisions based on current literature and standards of care. Practicing with this level of autonomy in decision-making is new
for many nurse anesthesia students and therefore, it is necessary to educate them on this concept. Given the serious legal implications, it is vital that this group receives this education, and acquires a strong understanding of how to provide care as an anesthesia provider in a manner that is safe, effective, and legally defendable.

Two important principles of legally defendable anesthesia are the need for justification for every decision and action, and the fact that malpractice litigation can proceed only if patient harm occurs. With these principles in mind, teaching SRNAs to practice in a way that is legally defendable and that limits their risk of malpractice provides them with a set of skills that makes them safer, smarter providers. As a result, these SRNAs have an enhanced ability to care for patients and protect them from potential harm.

In New York, the political agenda of CRNAs includes working to gain title protection and full scope of practice. To achieve this, CRNAs need to be seen as safe, smart providers. An improved understanding of how to engage in legally-defendable decision-making as an anesthesia provider has the potential to reduce the rate of malpractice lawsuits filed against CRNAs. Fewer malpractice suits supports the image of CRNAs as safe, smart providers, supporting our political efforts.

The group of stakeholders impacted as a result of this project are important to note and include SRNAs, CRNAs, Anesthesiologists, hospital administrators, patients, and families. While the impact of the project on SRNAs and CRNAs has been discussed, views on the project from the perspective of additional stakeholders is necessary. Anything that improves the practice of an anesthesia provider should be seen as having a potential benefit for patients and families. Avoidance of negative patient outcomes and malpractice litigation is a goal of any hospital administrator, so a project that enhances the knowledge of anesthesia providers should be seen as
beneficial from this perspective. Because CRNAs and Anesthesiologists are able to provide the same type of care and therefore compete, some Anesthesiologists may think of more malpractice litigation against CRNAs as helpful in their desire to be seen as superior anesthesia providers. However, if working in an anesthesia care team model in which CRNAs and Anesthesiologists work together, more knowledgeable CRNAs and the avoidance of malpractice litigation would be beneficial for both parties. Additionally, Anesthesiologist-owned anesthesia groups and any individual prioritizing patient outcomes would like to see a reduction in malpractice litigation against any anesthesia provider in their group.

The American Association of Colleges of Nursing (AACN) developed a list of essential elements to be included in the curriculum of DNP programs. This project aligns with four of the eight essentials: scientific underpinnings for practice, organizational and systems leadership for quality improvement and systems thinking, clinical scholarship and analytical methods for evidence-based practice, and advanced nursing practice (AACN, 2006). In regard to the scientific underpinnings for practice, the project involved the development and evaluation of a new practice approach based on theory. Thinking about organizational and systems leadership for quality improvement and systems thinking, the project educated SRNAs knowing that professional accountability for healthcare quality and patient safety is part of their code of ethics. It was not the goal of the project to teach SRNAs to avoid malpractice litigation by passing on accountability to others, but rather to teach them to act in a smarter, safer way, that protects their patients. This project relates to clinical scholarship as existing literature was critically appraised in order to identify the best evidence for practice, and to present that information to SRNAs. Finally, this project is in line with the advanced nursing practice essential as it aimed to enhance SRNAs’ level of clinical judgment, and allowed the researcher to act as a mentor to support other
nurses in achieving excellence in nursing practice. Given its links to the DNP essentials, this project is relevant to the curriculum of the DNP program at the University at Buffalo.

**Objectives**

The primary goal of this project was to improve first and second year SRNAs’ understanding of how to provide anesthesia in a legally defendable manner. To achieve this goal, an educational intervention was provided to students. A pretest-posttest format was used to evaluate the level of success of the project in achieving this goal. By improving students’ understanding of the concept of legally defendable practice, a secondary goal was to reduce the rate of malpractice suits filed against practicing CRNAs who complete their training at the University at Buffalo.

**PICO Question**

In first and second year students enrolled in the University at Buffalo Nurse Anesthesia program, does an educational lecture on legal concepts in anesthesia result in a higher level of understanding of how to provide legally defendable anesthesia care, when compared with the level of understanding of students who have not received this type of educational lecture?

**Literature Review**

It is important for new anesthesia providers to look at past malpractice claims to know what elements of care are commonly found to be the source of provider error and negative outcomes. By understanding what the common issues are, new anesthesia providers will be better prepared to avoid making the same errors and avoid litigation. A search of the current literature revealed several studies investigating the details of past anesthesia malpractice claims.

Wilbanks, Geisz-Everson, and Boust (2016) performed a qualitative descriptive study, looking at 245 anesthesia-related closed claims, with a specific focus on determining the factors
impacting and consequences of documentation quality in the claims reviewed. The major factors identified as contributing to poor documentation were production pressure, normalization of deviance, and perceived healthcare provider complacency. Consequences of poor documentation identified in the study included using inaccurate information to guide patient care decisions, impeding the evaluation of patient care events in the defense against malpractice allegations, and questioning the quality of care provided. The major themes identified from the analysis were that poor documentation quality can result in negative consequences for clinicians and can negatively impact patient safety.

A study conducted by Ranum, Ma, Shapiro, Chang, and Urman (2014) sought to examine anesthesia closed claims for patterns of injuries, to assess how patient comorbidities affect outcomes, and to determine how patterns of injury vary based on practice setting. Using a quantitative approach, the researchers analyzed 607 claims. The results showed that the most frequent injuries were teeth damage, death, nerve damage, organ damage, pain, and arrest. It was found that patient comorbidities can affect outcomes, with obesity identified most frequently as a contributing factor. Hospitals with less than 100 beds had the highest injury-to-claim rates, while ambulatory surgery centers were found to have the lowest death-to-claim rates.

Jordan and Quraishi (2015) examined 245 closed claims in order to identify quantitative trends as well as qualitative themes and underlying concepts. This mixed methods descriptive analysis found that the majority of claims involved a male CRNA, working as an independent contractor. Most adverse events were found to have taken place during the intra-anesthesia period. Death resulted from an adverse event in 35.1% of claims. It was concluded that 45.5% of negative outcomes were preventable, a CRNA’s actions were the cause of a negative outcome 29% of the time, and anesthesia treatment was found to be inappropriate 32.7% of the time. Pre-
induction activities such as physical examinations and chart reviews were identified as contributing to the lawsuit in 22.9% of claims. The authors concluded that the data they disseminated identifies anesthesia safety topics to be further investigated in order to support best anesthesia practice.

In a similar study, Jordan, Quraishi, and Liao (2013) performed a retrospective analysis of 369 anesthesia-related malpractice payments. The aim of the review was to quantitatively assess the frequency and trends of CRNA-associated malpractice payments. The most common allegations against CRNAs were failure to monitor, improper performance, and problems with intubation. A relationship was noted between the rate of committing a specific allegation and the severity of injury. Prevalent characteristics of patients involved in CRNA malpractice claims were age 40 to 59 years, inpatient status, and female gender. Greater malpractice payments resulted if injuries greatly impacted quality of life. In comparison to a similar study that gathered data from the same database approximately 14 years earlier, it was noted that there have been only minor changes regarding the occurrence of specific allegations, and there has been a decrease in the total frequency of CRNA malpractice payment reports.

Larson, Matthews, Jordan, and Hirsch (2018) conducted a study focused on analyzing the characteristics and patterns of closed claims in which a CRNA was involved and a respiratory event was the cause of an adverse outcome. The researchers used a retrospective, exploratory, quantitative research design, gathering data from the AANAF Closed Claim database. A total of 84 claims were determined to meet the inclusion criteria and were used for analysis. It was found that respiratory adverse outcomes resulted in mortality or significant, permanent morbidity in 69% of claims, and it was determined that these adverse outcomes were preventable in 81% of claims. In 37% of claims, the use of respiratory depressant medications was identified as the
cause of inadequate ventilation and oxygenation. Failure to optimally monitor the patient’s ventilation was noted to be a contributory practice pattern in every hypoventilation claim. The researchers concluded that reviewing closed claims as they have done can reduce adverse outcomes in the future, by sharing and learning from these events.

A report by Genovese, Blandino, Midolo, and Casali (2016) details a study they performed to identify possible recurrent pitfalls in anesthesia-related malpractice claims. Using a retrospective, quantitative approach, the research team conducted an analysis of archival data from a large, Italian insurance broker, gathering information from 317 claims. A surgery-linked adverse event was identified in 225 malpractice claims. A surgeon’s activity was not considered contributory to the claim in 92 cases, with 42.3% of these instances involving dental damage associated with oral intubation procedures. Of 114 intraoperative malpractice events, 66 cases were found to be acute iatrogenic injuries occurring during anesthesia procedures, while 45 cases involved adverse reactions to medications. In three of the claims, incorrect patient positioning was identified as the cause of sciatic nerve dysfunction. The patient outcome found to be most frequently associated with a malpractice claim was permanent impairment. Based on their findings, the researchers stated that anesthesia as a medical specialty has a low risk for medical malpractice claims.

Kent, Stephens, Posner, and Domino (2017) performed a study to analyze anesthesia malpractice claims in nonspine orthopedic surgery. They sought to determine how claims associated with this surgical specialty differ from others. Using a retrospective, quantitative approach, the research team gathered data from the Anesthesia Closed Claims Project database. A sample of 475 claims related to nonspine orthopedic surgery were analyzed and compared with 1,592 claims related to other procedures. It was found that anesthesia malpractice claims
related to nonspine orthopedic surgery were more often associated with events resulting from the use of regional anesthesia, such as nerve injuries. Of the set of claims filed for the development of neuraxial hematomas, ninety percent of patients had been receiving anticoagulant medication, and severe long-term injuries occurred in all cases. Central ischemic injuries associated with the beach chair position for orthopedic surgery occurred in more patients than just those considered to be at high risk for ischemic stroke. Most claims for respiratory depression involved events occurring on the day of surgery or the next day, and primarily consisted of patients who underwent lower extremity procedures. Given the findings, the researchers concluded that the higher frequency of nerve injury in orthopedic surgery may simply be the result of the increased use of regional anesthesia. Providers must be careful when using neuraxial anesthetic approaches in the presence of an anticoagulation regimen. Cerebral perfusion pressure needs to be calculated and blood pressure monitored closely when patients are in the upright position. Last, providers must exercise caution in the administration of multiple opioids, and ensure patients are provided care in settings with enhanced respiratory monitoring.

In a study by Honardar, Posner, and Domino (2017), the research team analyzed anesthesia malpractice claims to identify factors contributing to instances of delayed detection of esophageal intubation. Using a retrospective, quantitative approach and gathering data from the Anesthesia Closed Claims Project database, a total of 45 malpractice claims were analyzed. Delayed detection of esophageal intubation occurred 49% of the time in a location where CO₂ detection equipment should be available, such as an operating room. Ignoring, misinterpreting, or not using CO₂ readings were identified as common factors contributing to delayed detection. Misdiagnosis was cited in 33% of claims, while communication problems were noted in 27% of claims. Delayed detection of esophageal intubation resulted in patient death or severe brain
damage in 96% of claims. Despite the availability of technology to confirm correct endotracheal tube placement, an array of factors, including the cognitive factors of fixation error, confirmation bias, and overconfidence, have allowed the problem of delayed detection of esophageal intubation to persist.

Woodward, Urman, and Domino (2017) conducted a study in which they evaluated claims from the Anesthesia Closed Claims database to assess current trends and outcomes of non-operating room anesthesia (NORA). Using a retrospective, quantitative approach, analysis was completed on 1,900 claims, 72 involving procedures in NORA locations and 1,828 claims for operating room procedures. A higher proportion of malpractice claims for both aspiration pneumonitis and death were identified in NORA locations, when compared to the OR setting. Monitored anesthesia care was found to be a common anesthetic approach cited in NORA malpractice claims, with inadequate oxygenation and ventilation responsible for one-third of claims. There was a higher frequency of NORA claims in cardiology and radiology locations in relation to the number of anesthetics administered, indicating an increased risk of adverse events in these locations. According to the researchers, poor outcomes in closed claims can be due to suboptimal care and non-adherence to basic safe practice principles. Despite some findings that may question the safety of NORA, the research team argued that it is safe overall.

There is ample literature available that reviews past anesthesia malpractice claims. Since anesthesia providers are tasked with keeping patients safe, a failure or mistake made by an anesthesia provider can easily lead to patient harm and result in a malpractice lawsuit. A majority of the studies reviewed showed that negative outcomes resulted from the actions of providers. These actions could have been prevented if providers were more aware of the potential consequences of their behaviors. Educating SRNAs on how to practice in a legally defendable
manner can limit their legal risk by making them more vigilant of their actions and their approach to practice.

**Theoretical Framework**

The focus of this project was on improving SRNAs’ understanding of how to provide anesthesia in a legally defendable manner. Based on the nature of the project, a theory from the discipline of psychology was applied. Jean Piaget’s theory of Genetic Epistemology looks at knowledge development (Boettcher & Conrad, 2016). Specifically, this theory is based on the idea that cognitive development is the result of a constant effort to balance assimilation and accommodation processes in order to adapt to the environment (Boettcher & Conrad, 2016). Assimilation takes place when information is taken into an individual’s existing schema. Conversely, accommodation occurs when changes are made to existing schemas based on new information or experiences. An additional component of Piaget’s theory is cognitive structures, or patterns of mental or physical action underlying specific acts of intelligence (Boettcher & Conrad, 2016). This theory applies to both the content provided by the educational lecture and the future actions of the study participants. In both instances, individuals need to take in new information and determine if and how to adjust their schemas based on the information. Actions are then taken according to this updated intelligence.

Piaget (1970) makes the point that scientific knowledge cannot be considered definitive or stable, as it exists in a state of perpetual evolution, changing rapidly. He goes on to discuss the concept of scientific thought as a process rather than a momentary, static instance. This process consists of continual construction and reorganization. The goal of this project was not to teach a specific set of knowledge to students, but rather, to teach them how to review the current state of knowledge on a continual basis, and how to go about adopting it into practice. The aim was for
these new anesthesia providers to be familiar with how to adjust their practice to what would be considered appropriate and legally defendable based on the current literature and scientific findings of that moment in time.

Methods

Design and Variables

The goal of this project was to improve SRNAs’ understanding of how to provide anesthesia in a legally defendable manner. Using a quantitative, pretest-posttest design, assessment of student understanding took place before and after an educational intervention in order to assess the impact of the intervention. Students received an electronic version of the assessment early in the fall semester for completion at that time, then received the educational lecture later in the semester, followed immediately by a repeat assessment.

The primary outcome assessed was student scores on an assessment of their understanding of legal concepts in anesthesia. This primary outcome was also the dependent variable, while the primary independent variable was the receipt of the educational intervention. Demographic data collected from subjects provided additional independent variables, including age, years of experience as a nurse or in the healthcare field, and amount of previous training or experience with malpractice litigation and the legal aspects of healthcare delivery.

Population, Sample, Setting

The population of interest is the SRNA community as a whole. This population is made up of Bachelor’s-prepared registered nurses with a minimum of one year of critical care experience, currently enrolled in a Master’s or Doctorate-level graduate nursing program. The source of subjects for this study was the University at Buffalo Nurse Anesthesia program. Recruitment materials consisting of a flier, description of the study, and consent form were sent
via email to all first- and second-year students. Of the 36 potential participants, 25 completed the pre-test, but only 23 completed consent forms, attended the educational lecture, and completed the post-test. Of these 23 participants, 22 completed all questions in the pre- and post-test, producing a final sample size of 22 for analysis.

Data Collection

The data collection tool used for this study was a written assessment designed by the researcher, and an accompanying survey to collect demographic data. The assessment aimed to evaluate SRNAs’ understanding of decision making in anesthesia, legal concepts and definitions pertaining to medical negligence and standards of care, and current anesthesia malpractice trends gathered from existing literature on closed claims (see Appendix A). With no prior use, the research instrument was distributed to senior SRNAs for evaluation, in order to establish its validity and reliability. A test-retest approach was used to establish the reliability of the instrument. Content validity of each question was assessed by asking senior SRNAs to rate each question’s readability, clarity, and relevance to the topic of defendable anesthesia care and legal considerations for anesthesia providers. Using a likert scale, each of the three elements was rated for each question. Scores were then averaged and any question with an average score below a designated threshold was removed from the assessment.

Educational Intervention

To achieve the goal of improving SRNAs’ understanding of how to provide legally defendable anesthesia, an educational intervention was provided to students. The intervention was administered on two separate days, once to any first-year students who chose to participate, and once to any second-year students who chose to participate. Each session lasted approximately 90 minutes, and took place on days that students were already on campus for their
other coursework. The intervention consisted primarily of a lecture format with a presenter discussing various legal topics guided by a powerpoint presentation. The topics covered in the lecture included: medical negligence, standards of care, decision making in anesthesia, informed consent, documentation, postoperative follow-up, and communication. Additionally, literature on past and current anesthesia malpractice trends was discussed. Participants were placed into small groups to discuss case studies, then brought back together to share their findings with the larger group. A game was implemented at the conclusion of the lecture, that along with the groupwork, was intended to improve participants’ understanding and retention of the content covered in the lecture.

**Statistical Analysis**

Upon completion of both assessments and the demographic survey, data was entered into Microsoft Excel and coded for transcription into SPSS. Data was analyzed using IBM SPSS Statistics version 25. Certain assumptions were needed in order to perform the statistical analysis. Though the ideal approach would have been to obtain a group of study participants via random sampling, the research team settled for a non-random convenience sample. All first- and second-year SRNAs at the University at Buffalo who agreed to participate made up the sample. This group was still relatively representative of the SRNA population as a whole, but the research team remained cautious when attempting to make generalizations, based on the findings, about the entire SRNA population (Polit, 2010).

Parametric tests were run on the data, one specific test being a dependent groups two-sample t test. It was hypothesized that the post-intervention group mean assessment score would be higher than the pre-intervention group mean assessment score. Pearson’s r was used to
evaluate the degree of correlation between additional variables gathered from the demographic survey and assessment scores.

**Results**

A total of 22 SRNAs completed the pre- and post-test and were included in the sample for analysis. Their demographic data is displayed in Table B1. The mean age of the sample was 29.5 ± 4.26, and the mean number of years as a nurse prior to starting CRNA school was 5.75 ± 2.96. Most participants (19/22) rated their prior knowledge or experience with malpractice litigation and the legal aspects of healthcare delivery as “minimal”.

Table B2 reveals that pre-intervention assessment scores ranged from 43% to 86%, with a group mean of 65.55% ± 10.756. Post-intervention assessment scores showed improvement, ranging from 57% to 90%, with a group mean of 78.32% ± 8.126. A dependent groups two-sample t test was run to compare the pre-intervention and post-intervention sets of assessment scores. Displayed in Table B3, the mean difference in assessment scores between groups was 12.773 ± 12.554, with a statistically significant t value of 4.772 ($p < .001$, CI = 7.206 – 18.339).

Analyses were run to determine any statistically significant correlations among age, years as a nurse before starting CRNA school, pre-test score, post-test score, and change in score. A matrix of the correlation findings is presented in Table B4. Age and years as a nurse before starting CRNA school were each found to lack any statistically significant correlation to pre-test score, post-test score, or change in score. Age was found to have a statistically significant correlation to years as a nurse before starting CRNA school ($r = .883$, $p < .01$). The only other statistically significant correlations were pre-test score and change in score ($r = -.767$, $p < .01$), and post-test score and change in score ($r = .529$, $p < .05$). Figure B1 consists of a scatterplot demonstrating the correlation between pre-test score and change in score.
Discussion

Reviewing the pre- and post-intervention sets of assessment scores, the minimum score, maximum score, and group mean score all showed improvement. Though a few participants’ scores decreased or remained the same, most increased. The degree of improvement in scores was substantial enough to be found statistically significant when measured with a dependent groups two-sample t test. This confirms the hypothesis that post-intervention group mean assessment score would be higher than pre-intervention group mean assessment score. Based on this finding, it can be argued that the educational intervention was effective in achieving the primary goal of the project of improving SRNAs’ understanding of how to provide legally defendable anesthesia.

The testing of correlations between variables yielded limited statistically significant relationships. Age and years as a nurse prior to starting CRNA school had a relatively strong correlation with statistical significance. However, it is reasonable to assume that individuals who are older likely spent more time working as a nurse prior to CRNA school. This explanation of the correlation reflects the fact that this finding was expected. Change in score was correlated with pre-test score as well as with post-test score. Pre-test score and post-test score could each independently be used to predict an individual’s change in score. The pre-test score – change in score correlation was negative, reflecting the fact that a higher pre-test score was associated with a lower change in score. Conversely, the post-test score – change in score correlation was positive, therefore, a higher post-test score was associated with a higher change in score.

The lack of a statistically significant correlation between age or years as a nurse prior to starting CRNA school and assessment score or change in score suggests that the educational intervention is suitable and effective for nurses of all ages and levels of prior experience as a
nurse. A 26 year old nurse with 5 years of ICU experience and a 36 year old nurse with 12 years of ICU experience had comparable pre- and post-test scores, and both showed a substantial improvement in score of greater than 20 points. Both the younger and more experienced nurse appear to have had similar success in learning and retaining the information presented in the educational intervention.

The third demographic variable measured in the study was prior knowledge and experience with malpractice litigation and the legal aspects of healthcare delivery. With 86% of the sample selecting “minimal” as their response to this question, it was made clear these first- and second-year SRNAs were lacking knowledge vital for their own legal protection as they complete or prepare to complete their clinical rotations as part of their program. Between their undergraduate nursing program, experience working as a nurse, and first part of their CRNA program, these students had not received adequate educational preparation on the subject of legal considerations in healthcare. Based on this finding, it is reasonable to suggest that the educational intervention used in this study should be incorporated into the UB CRNA curriculum. Incorporating the educational intervention earlier would allow students to acquire a strong understanding of legal considerations and how to protect themselves legally before they begin clinical rotations.

Of the 22 participants, 3 of them rated their prior knowledge and experience with malpractice litigation and the legal aspects of healthcare delivery as higher than “minimal”, answering “some” or “fairly comfortable”. This sub-group’s pre-test mean score was 65%, post-test mean score was 85.67%, and change in score was 20.67. The pre-test mean score was equal to the entire sample’s pre-test mean score, while the post-test mean score and mean change in score were greater than those of the entire sample. A possible explanation for this sub-group’s
differences in scores is that they may have learned about legal concepts in healthcare previously through their education or professional experiences, but had not drawn from that knowledge recently. The educational intervention allowed this subgroup to reacquaint themselves with material they had previously learned. Because they were simply reviewing concepts that they already knew, they were able to make a more drastic improvement in their assessment score.

Despite the sample being relatively homogenous, there was some degree of difference in participants’ age, years as a nurse prior to starting CRNA school, and prior knowledge and experience with malpractice litigation and the legal aspects of healthcare delivery. Based on the success of the educational intervention in being associated with an improved assessment score for the full range of participant demographics, it is reasonable to think that the intervention could be used effectively with other groups of anesthesia students and providers.

**Ethical Considerations**

As with all human subjects research, it is vital to ensure that all participants are protected from any unethical practices. Prior to the involvement of students in the research, this project was submitted to the IRB for approval. Additionally, students asked to participate were made aware that their participation in the study was voluntary, the extent of what would be asked of them was made clear up front, and they were informed that they were free to withdraw from the study at any time. Confidentiality was upheld, and any identifying student information has been kept on a flash drive stored in a locked file cabinet drawer of the primary investigator’s home office. This secure information will be kept for three years after the completion of the study, at which time the data will be destroyed.
Strengths and Limitations

The design of the project strengthens the findings. Because the sample consisted of students with similar professional backgrounds, enrolled in the same educational program, it can be considered a fairly homogenous group. Additionally, the assessment was administered before and immediately following the educational intervention. Together, these considerations helped to limit the effect of extraneous variables on the results produced. Another strength of the project was that the data collection tool and content of the educational lecture can be replicated for use in future studies.

The project had a narrow scope, as it focused on the major ideas necessary for a baseline understanding of legal concepts of anesthesia. Additionally, though it would be ideal to work with a large group of SRNAs from several different programs, a small group of SRNAs from a single program made up the sample for this study. Both the size and characteristics of the sample were limitations of the study, as the sample was small and was gathered using convenience, rather than random sampling. As a result, the strength of the statistical findings was limited, as a small, non-random sample impaired the ability to strictly abide by all assumptions necessary for the statistical analyses. This translates to a limited ability to generalize any findings to the larger population.

Further Implications

The goal of this project was to improve SRNAs' understanding of how to provide anesthesia in a legally defendable manner. The educational intervention was shown to be associated with an increased level of understanding as indicated by assessment scores, therefore this study has achieved its primary objective. By proving that this educational intervention can be used effectively to transform students into safer, smarter providers, more able to avoid
malpractice litigation, the argument can be made to incorporate the content of the educational intervention into the curriculum of the CRNA program at the University at Buffalo. It is also important to consider the fact that the risk of malpractice litigation continues to rise as an individual’s time in the field increases. This justifies another use of the project’s content for the development of a continuing education module for currently practicing CRNAs.

Complacency is one of several factors contributing to why practicing CRNAs make inappropriate decisions that lead to negative patient outcomes and malpractice litigation. Review of the current literature found that patient harm resulted from mistakes being made by providers that were clearly wrong. The improper actions were not a questionable difference of opinion, but a concept learned in school that aims to diminish known risks such as neuraxial anesthesia being contraindicated for patients on certain anticoagulation regimens. Ignoring such concepts increases a provider’s legal risk as they are canceling out these established risk reduction strategies. Use of this project’s content throughout a provider’s career to reiterate the importance of their behaviors and the potential legal consequences of their actions has the potential to counter complacency. Future studies need to look at additional factors impacting anesthesia providers’ actions and decision making, and strategies that promote safe, legally defendable behaviors.
References


### Demographic Data

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
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<td>Age (Years)</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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Table 2

Comparison of Pre- and Post-Intervention Assessment Scores

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<tr>
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<th>Std. Deviation</th>
<th>Minimum</th>
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<tr>
<td>Pre-Intervention</td>
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<td>Post-Intervention</td>
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<td>78.32</td>
<td>8.126</td>
<td>57</td>
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Table 3

*Dependent Groups Two-Sample t Test*

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<tr>
<th>N</th>
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<th>Std. Error of Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>dF</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td>22</td>
<td>12.773</td>
<td>12.554</td>
<td>2.677</td>
<td>7.206</td>
<td>4.772</td>
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Post-test Score – Pre-test Score
Table 4

**Correlation Matrix of Independent and Dependent Variables**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Years as a nurse before starting CRNA School</th>
<th>Pre-test Score (%)</th>
<th>Post-test Score (%)</th>
<th>Change in Score (%)</th>
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<tr>
<td>Age</td>
<td>-</td>
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<td>Years as a nurse</td>
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<td></td>
<td></td>
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<td>before starting</td>
<td>.883**</td>
<td></td>
<td></td>
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<td>CRNA School</td>
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<tr>
<td>Pre-test Score (%)</td>
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<td>Post-test Score (%)</td>
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<td>-</td>
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<tr>
<td>Change in Score (%)</td>
<td>-.141</td>
<td>-.130</td>
<td>-.767**</td>
<td>.529*</td>
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**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).
Figure B1. Higher Pre-Test Score Trend Toward Lower Change in Score
Appendix A

Data Collection Tool

Demographic Data

1. What is your age?

2. For how many years did you work as a nurse before starting CRNA school?

3. How would you rate your prior knowledge/experience with malpractice litigation and the legal aspects of healthcare delivery? Minimal / Some / Fairly Comfortable / Expert

Assessment

1. What elements are necessary for a medical negligence claim? (select all that apply)
   a. Duty
   b. Breach of Duty
   c. Fraud
   d. Causation
   e. Tort

2. What are common items cited in anesthesia malpractice claims?
   I. Opioids/respiratory depression
   II. Regional anesthesia
   III. Nerve injuries resulting from positioning
   IV. Dental damage associated with intubation
   V. Adverse reactions to medications
   a. I, II, III
   b. I, II, IV
   c. I, III, IV, V
   d. I, II, III, IV, V
3. What is the best approach to take when deciding on the administration of antiemetics?
   a. Zofran
   b. Zofran & Decadron
   c. Zofran, Decadron, & Phenergan
   d. At least two medications for all patients
   e. Consider the PONV risk factors of the patient
   f. Ask the Anesthesiologist for their opinion

4. Standard of Care can be defined as all of the following, EXCEPT:
   a. The level of care generally practiced by members of the profession in the same or similar circumstances
   b. Academic and clinical constructs against which your performance will be measured
   c. Care measures that would be provided by other CRNAs, but not necessarily Anesthesiologists
   d. The level of care expected of any anesthesia provider in a given situation

5. Define negligence
   I. Occurs when a CRNA does not exercise the required degree of skill and reasonable care espoused by the standard of care
   II. Presence of duty, breach, and fraud
   III. Intentional or unintentional
   a. I, II
   b. I, III
   c. II, III
   d. I, II, III
6. Which is the safest approach to care?
   a. Give every indicated medication
   b. Give only the medications that are absolutely necessary
   c. Base the selection of medications on the justification for them
   d. Base your approach on the patient's previous anesthetic records

7. What is the legally safest approach to communicating with patients and families? (Select TWO)
   a. Inform families immediately of any major patient complications that arise perioperatively
   b. Avoid any extra communication with families/do not make your role as a care provider widely known to the patient’s family
   c. Describe any major events impacting the patient to the family, including what treatments, interventions, and follow-up is planned
   d. Have the surgeon talk to the family about any intraoperative events

8. How is the standard of care established in a legal setting?
   I. Expert witness testimony
   II. Textbooks
   III. Authoritative treatises
   IV. Professional journal articles
   V. Facility policy and procedures
   VI. Standards or policy statements of professional organizations
   VII. State or federal statutes
   VIII. Prior case law
   a. I, VII, VIII
   b. I, II, VI, VII, VIII
   c. III, V, VI, VII
   d. I, II, III, IV, V, VI, VII, VIII
9. True/False: A provider must intentionally cause harm to the patient for a negligence claim to be brought against them.

10. All of the following are guidelines for obtaining informed consent, EXCEPT:
   a. List family members present for discussion on the consent form
   b. List what specific risks of anesthesia were discussed
   c. Avoid mentioning death as a risk to prevent any unwarranted anxiety
   d. List options of anesthetic approaches discussed and what was decided

11. True/False: It is appropriate to document equipment/machine checks on each patient’s anesthetic record.

12. Which of the following are reasons why the quality of a CRNA’s documentation can pose a legal risk for the provider? (select all that apply)
   a. Detailed, legible documentation makes information about the course of the anesthetic and the provider’s actions widely available
   b. Documented information, accurate or not, guides patient care decisions
   c. poor documentation leads to questioning of the quality of care provided
   d. difficult to defend provider if nobody can determine what was done

13. All are important aspects of the post-operative follow-up visit, EXCEPT:
   a. To provide an explanation for any negative parts of the anesthesia experience
   b. To inquire about and make note of any pain or awareness during the anesthetic
   c. To check and report on the patient’s post-operative condition while avoiding taking responsibility for any negative experiences
   d. To ensure transfer of care to an appropriate licensed individual has taken place
14. True/False: To reduce potential liability, CRNAs should always pattern their practice in accordance with the established standards of care.

15. What are the common factors contributing to the delayed detection of esophageal intubation? (Select TWO)
   a. Ignoring $CO_2$ readings
   b. Misinterpreting $CO_2$ readings
   c. Lack of $CO_2$ detection equipment
   d. Failure of $CO_2$ detection equipment

16. What commonly leads to legal action being carried out following the administration of regional anesthesia?
   a. Incomplete nerve block when used in combination with GA
   b. Lack of sensation in the extremity four hours postoperatively
   c. Lack of motor function in the extremity four hours postoperatively
   d. Neuraxial hematoma associated with anticoagulant therapy

17. True/False: Documentation indicating review of the patient’s medical history by the Anesthesiologist is adequate for the CRNA’s assumption of care.

18. All of the following are common findings in anesthesia malpractice claims, EXCEPT:
   a. Inadequate ventilation/oxygenation
   b. Failure to provide complete analgesic relief postoperatively
   c. Failure to optimally monitor the patient
   d. Central ischemic injury related to beach chair position

19. True/False: Facility policies and procedures are considered self-imposed standards of care.
20. Case Study (part 1): A CRNA induces the patient for general anesthesia, intubates the patient, and turns on the ventilator and inhaled anesthetic vaporizer. The provider then leaves the room. Is the provider guilty of medical negligence?

a. Yes
b. No
c. Only if harm to the patient occurred as a result of the provider’s absence
d. Not enough information to determine

21. Case Study (part 2): The patient’s ureter is nicked by the surgeon during the period of time that the CRNA is absent from the room. Is there adequate evidence to support a medical negligence claim against the CRNA?

a. Yes
b. No
c. Not enough information to determine
September 5, 2018

Dear Peter Steele:

On 9/5/2018, the IRB reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Initial Study</th>
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<tr>
<td>Title of Study:</td>
<td>Educating SRNAs about the Practice of Legally</td>
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<tr>
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<td>Defendable Anesthesia</td>
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<tr>
<td>Investigator:</td>
<td>Peter Steele</td>
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<tr>
<td>IRB ID:</td>
<td>STUDY00002783</td>
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<tr>
<td>Documents Reviewed:</td>
<td>Steele Data Collection Tool, Category:</td>
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<td>Steele Lecture Topical Outline, Category: Other;</td>
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<td>Steele Recruitment Flyer, Category: Recruitment</td>
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<td>Materials</td>
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The IRB approved the study from 9/5/2018 to 9/4/2019 inclusive. The Initial study materials for the project referenced above were reviewed and approved by the SUNY University at Buffalo IRB (UBIRB) by Non-Committee Review. The IRB has determined that the study is no greater than minimal risk. Before 9/4/2019 or within 30 days of study closure, whichever is earlier, you are to submit a continuing review application with required explanations. In order to avoid a lapse in IRB approval, it is recommended that you submit your continuing review at least 30 days for an expedited study and at least 45-60 days for a full board study, prior to the approval end date of the study. You can submit a continuing review application by navigating to the active study in Click IRB and selecting ‘Create Modification / CR’. Studies cannot be conducted beyond the expiration date without re-approval by the UBIRB.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

UBIRB approval is given with the understanding that the most recently approved procedures will be followed and the most recently approved consent documents will be used. If modifications are needed, those changes may not be initiated until such modifications have been submitted to the UBIRB for review and have been granted approval.
University at Buffalo Institutional Review Board (UBIRB)
Office of Research Compliance  Clinical and Translational Research Center Room 5018
875 Ellicott St.  Buffalo, NY 14203
UB Federalwide Assurance ID#: FWA00008824

As principal investigator for this study involving human participants, you have responsibilities to the SUNY University at Buffalo IRB (UBIRB) as follows:

1. Ensuring that no subjects are enrolled prior to the IRB approval date.

2. Ensuring that the study is not conducted beyond the expiration date without re-approval by the UBIRB.

3. Ensuring that the UBIRB is notified of:
   - All reportable information in accordance with the New Information SOP (HIRP-024).
   - Project closure/completion by submitting a Continuing Review/Modification submission.

4. Ensuring that the protocol is followed as approved by UBIRB unless a protocol amendment is prospectively approved.

5. Ensuring that changes in research procedures, recruitment or consent processes are not initiated without prior UBIRB review and approval, except where necessary to eliminate apparent immediate hazards to subjects.

6. Ensuring that the study is conducted in compliance with all UBIRB decisions, conditions, and requirements.

7. Bearing responsibility for all actions of the staff and sub-investigators with regard to the protocol.

8. Bearing responsibility for securing any other required approvals before research begins.

If you have any questions, please contact the UBIRB at 716-888-4888 or ub-irb@buffalo.edu. Please include the project title and number in all correspondence with the UBIRB.
Educating SRNAs about the Practice of Legally Defendable Anesthesia

Peter Thomas Steele

Background Justification & Significance

- Financial Impact
- Time away from patient care for litigation - lost productivity, income
- AANA Code of Ethics

Purpose

- Primary goal: To improve first and second year SRNAs' understanding of how to provide anesthesia as a legally defendable service (measured by this study)
- Secondary goal: To reduce the rate of malpractice suits that against graduating CRNAs who complete that training, at the University at Buffalo (measured by surveys sent periodically to US Nurse Anesthesia program graduates)
PICO Question
- A first- and second-year student in the University at Buffalo House Anesthesiology program
- A teaching lecture on legal considerations for providing anesthesia care, as compared with the level of understanding of students who have not received this type of educational lecture
- Population: First- and second-year students enrolled in the University at Buffalo House Anesthesiology program
- Intervention: A teaching lecture on legal considerations for providing anesthesia care
- Comparison: Students who have not received this type of educational lecture
- Outcome: Level of understanding of how to provide legally defensible anesthesia care

Summary of Literature Review
- Scientific knowledge (Paget, 1970)
- Not definitive or stable
- Exists in a state of perpetual evolution
- Scientific thought
  - A process rather than a directory, static existence
  - Continuous construction and reorganization
- Goal of the project: To teach students how to review the current state of knowledge on a continual basis, and how to adapt it into practice

Theoretical Framework
- Scientific Knowledge
  - Jean Piaget
- Based on the idea that cognitive development is the result of a constant effort to balance assimilation and accommodation processes in order to adapt to the environment (Piaget, 1937).
- Applies to both the content provided by the educational lecture and the future actions of the study participants
- Individual tasks in new information and determine if and how to adjust their schemas based on the information
- Authors are then driven according to this updated intelligence.
Summary of Literature Review

- Adverse events that are preventable or avoidable – negative outcomes could have been prevented.
- Need to better educate providers to be more aware of the potential consequences of their behaviors.
- Goal of this project to address this problem.

Methods

Design:
- Quasi-experimental
- Pretest/posttest

Setting:
- University of Buffalo Nurse Anesthesia Program

Sample:
- 90 subjects – first-year and second-year students
- Second-year students randomized to attend the educational intervention at least one year ago in ICU anesthesia

Educational Intervention:
- PowerPoint presentation on material covered in lecture
- Small group discussion of case studies
- Game to review content covered in lecture

Data Collection Procedures/Pretest:
- Admitted to 50 exit criteria set by the institution
- Demographic data collected

Data Collection Tool:
- Written examination, web-based, and accompanying demographic survey
- Validity and reliability: Cronbach’s alpha = .80
- Retest-retest reliability evaluation over 2 weeks
- Decision making in anesthesia
- Legal concepts/terms pertinent to medical negligence and standards of care
- Current anesthesia sedation trends (published based on existing literature and deal cases)

Educational Intervention:
- 90 minutes
- Administered on two separate days to accommodate participant's scheduled coursework

Format:
- Lecture - presenter discussed various legal topics guided by a PowerPoint presentation
- Small group discussion of case studies
- Game to review content covered in lecture
Methods

- Case Selection
- Pre-interaction Assessment Scoring
- Post-interaction Assessment Scoring

Results

- Pre-interaction Assessment Scores
  - Mean = 83.90% ± 15.75% (Range: 42% to 88%)

- Post-interaction Assessment Scores
  - Mean = 80.32% ± 13.53% (Range: 57% to 97%)

- Independent Groups Two-Sample T Test
  - Difference in assessment scores between groups
  - Mean = 3.57% ± 1.55% (Range: -0.61% to 7.60%)

Results

- Age
  - Mean = 26.3 ± 4.36

- Years as a nurse before starting CRNA school
  - Mean = 6.79 ± 3.74

- Prior knowledge/experience with malpractice litigation and the legal aspects of healthcare delivery
  - Mean = 7 (0-10) (10 = Fully Comfortable, 0 = Not Comfortable)
Conclusions

- Degree of improvement in group mean assessment scores was substantial enough to be found statistically significant when measured with a dependent groups two-sample t test.
- Confirm hypothesis that post-intervention group mean assessment score would be higher than pre-intervention group mean assessment score.
- Primary goal achieved - improved SRNA's understanding of how to provide legally defensible anesthesia.
- No statistically significant correlation between age or years as a nurse prior to starting SRNA school and assessment scores or change in score.
- Intervention resulted in excellent marks of all ages and levels of peer experience.

Contribution to Clinical & Professional Practice

- Two important principles of legally defendable anesthesia:
  - The need to justify actions for every decision and action.
  - Malpractice litigation can proceed only if patient harm occurs.
- Treating SRNA's to practice in a way that is legally defendable and that finds their skill of practice provides them with a set of skills that enables them safer, smarter, and proficient.
- This enhances their ability to care for and protect patients from potential harm.

Conclusions

- Poor training/Legal exposure to malpractice litigation and the legal exposure of healthcare delivery.
- The paucity of the literature indicates that training and ongoing training for SRNA's should be emphasized.
- Educational information used in this study should be incorporated into the US CRNA curriculum.
- Role of malpractice litigation continues to rise up on individual's lives in the field.
- Future use of the project's content for the development of a continuing education module for currently practicing CRNAs.
### Strengths

- Study Design: multi-effect of extensive variance on the results
- Management sample similar to educational background, admitted to the same educational program
- Timing of the assessment before and immediately after the educational intervention
- Able to replicate the data collection tool and content of the educational lecture for use in future studies

### Limitations

- Sample
  - Characteristics - homogeneous, not representative sampling
- Variable Score
  - Limited to the major scale necessary for a limited understanding of the rapid concepts of anesthesia

### References