

## **(Qualitative Research)**

### **A Content and Thematic Analysis of Closed Claims Resulting in Death**

*Anne Marie Hranchook, DNP, CRNA; Lorraine M. Jordan, PhD, CRNA, CAE, FAAN; Marjorie Geisz-Everson, PhD, CRNA, FNAP; Maria Hirsch, DNAP, CRNA; Robert W. Matthews, PhD, CRNA*  
Oakland University

**Introduction:** Qualitative research methodology can be an effective approach to providing clarity and an understanding of anesthesia adverse events. Using content and thematic analysis, closed claims where the outcome was death were reviewed. The purpose of this study was to identify themes that would provide unique insights into the events leading up to death with a focus on the role anesthesia may or may not have had in the outcome.

**Literature Review:** Mortality attributable to anesthesia has declined significantly over time. The reasons include the introduction of respiratory monitoring, use of evidence-based practice guidelines, and advances in teamwork and education. Although anesthetic mortality has improved, studies evaluating the contribution of anesthesia to perioperative mortality are needed to enable improvements in quality and safety.

**Methodology:** This study was IRB approved by the American Institute of Research. Content and thematic analysis, a qualitative framework approach, was employed to analyze closed malpractice claims. Through this method, patterns, features, and themes specific to the sample could be identified facilitating interpretation and understanding of a dataset.

**Data Collection & Methods:** In 2015, the insurer, CNA, made available to the AANA Foundation Closed Claim Research Team 245 closed claim files. Of the 245 files, an adverse event leading to death occurred in 87 of the claims. Applying a qualitative thematic framework approach, data from each file were extracted and entered onto a previously validated closed claim instrument. The instrument has 4 distinct sections including the reviewer's narrative, reviewer's assessment, listing of accusations, and a description of key lessons learned. From the narrative, code words capturing the phenomena of interest were generated. Through analytical reflection of the data set, themes were identified. Prior to data entry, all research claim reviewers participated in a protocol session and interrater reliability was established.

**Results & Data Analysis:** All claims were analyzed adhering to the described method. Four major themes emerged from the thematic analysis: (1) patient factors, (2) anesthesia provider factors, (3) environmental factors, and (4) team/group factors. In addition, 16 subthemes were identified. Excerpts demonstrating evidence of the major themes were drawn from the claims.

**Discussion & Conclusions:** The AANA Foundation researchers identified 87 deaths resulting in closed malpractice claims during a 10-year period. Major events leading to death were categorized as respiratory, cardiac, and drug related. The major themes contributing to events leading to death include patient, provider, environmental, and team/group factors. The analysis of these claims exposed important and previously unappreciated aspects of adverse outcomes in cases involving CRNAs.

## **(Quantitative Research)**

### **The Effect of Debriefing with Good Judgment on Nurse Anesthesia Students' Critical Event Recognition, Response, and Treatment**

*Carlene McLaughlin, PhD, CRNA*

Villanova University

**Introduction:** This experimental study evaluated the overall effect of a structured method of debriefing compared with the usual method of debriefing conducted during a high-fidelity patient simulation experience in a nurse anesthesia program. The measured outcomes were: knowledge level, ability to recognize and treat critical events, and perceptions of debriefing quality as assessed by the Debriefing Assessment for Simulation in Healthcare student version (DASH-SV).

**Literature Review:** Research has shown high-fidelity simulation followed by debriefing to be an effective educational strategy for improving clinical performance and increasing clinical knowledge. The majority of debriefing studies have been conducted with undergraduate and graduate nursing students, medical students, and medical residents; however, none have been conducted with nurse anesthesia students.

**Research Design:** This study used a true experimental design with random assignment of students to 1 of 2 groups.

**Methods:** A sample of 24 nurse anesthesia students was randomly assigned to either the usual method of debriefing (control group) or the structured method of debriefing (experimental group). Each group completed a knowledge pretest and posttest, participated in the same 3 simulations that were scored, and received the assigned method of debriefing immediately following the simulation that was assessed for quality.

**Data Collection:** The Crisis Resource Management Scoring Rubric (CRMSR) evaluated task management, teamwork, and situation awareness during the simulations. The knowledge pre- and post-test assessed changes in the level of knowledge. The DASH-SV assessed the quality of each debriefing method. The demographic form assessed for differences between the groups.

**Results & Data Analysis:** The within-subjects 2 x 3 RM-ANOVA of the CRMSR categories revealed improved scores over time: task management ( $p = .008$ ), teamwork ( $p = .002$ ), situation awareness ( $p < .001$ ). The within-subjects 2 x 2 RM-ANOVA of the knowledge pretest and posttest revealed an improved level of knowledge ( $p < .001$ ). No significant difference was found between the 2 groups' performances or knowledge level as a result of the method of debriefing. The DASH-SV elements' 2 x 3 RM-ANOVA revealed no significant differences between the 2 groups' debriefing ratings suggesting similar debriefings. The demographic differences were not significant.

**Discussions & Conclusions:** This research study compared 2 methods of debriefing after simulation and aimed to contribute evidence to teaching strategies utilized in nurse anesthesia education. The results further supported findings in the current literature that support debriefing as an effective educational strategy. Debriefing should be used by nurse anesthesia educators to deliver important concepts to nurse anesthesia students, in order to prepare safe, competent professionals.

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## (Case Report)

### Synthetic Hallucinogenic Drugs

*Kelly Moon, MSN, CRNA; Christopher Humston, MSN, CRNA; Renata Miketic, MD; Joseph Tobias, MD; Peter Ma, MD*

Nationwide Children's Hospital

**Introduction:** The designer drug classification of illicit substances has gained the attention of law enforcement agencies, healthcare providers, and concerned families around the world. There has been a significant increase in the abuse of these new designer drugs and healthcare providers will see an increased prevalence of patients using these substances. Clinicians need to be knowledgeable regarding these substances and how to provide safe and appropriate anesthesia care.

**Literature Review:** NBOMe is a full agonist at the 5-HT<sub>2A</sub> receptor. This receptor is responsible for complex behaviors and thought processes, from working memory to affective disorders such as depression and schizophrenia. Stimulation of this receptor produces the hallucinogenic effects recreational users are seeking. Patients ingesting NBOMe frequently display signs of serotonin syndrome, a potentially fatal complication related to the overstimulation of the serotonin receptor. Diagnosis is purely clinical and differentiation is essential for the provision of safe anesthesia care.

**Description of the Case:** A 16-year-old male presented to the emergency department for assessment due to recent neurologic changes and abnormal findings on MRI at an outside facility. Upon evaluation, the patient was demonstrating left-sided weakness and persistent shaking without definitive seizure activity. Another MRI was ordered and the patient was placed under general anesthesia to obtain optimum MRI quality. The MRI revealed large zones of signal abnormality suggesting acute leukoencephalopathy. Exact etiology for these findings was unknown due to the patient not providing information regarding illicit drug use. Blood tests and cerebrospinal fluid analysis were all negative. Based on the lack of etiology, neurosurgical consultation determined a brain biopsy was indicated. After the patient's admittance to the ingestion of NBOMe, the diagnosis of toxic leukoencephalopathy and serotonin syndrome was determined.

**Discussion & Conclusions:** NBOMe is a designer synthetic hallucinogen that acts through the serotonin receptor, 5-HT<sub>2A</sub>. Toxicity is primarily related to the exaggerated serotonergic stimulation producing seizures, hypertonicity, hyperthermia, and rhabdomyolysis. Anecdotal experience in our patient also suggests that long-term use may result in irreversible damage to the central nervous system. Anesthesia providers should maintain a high level of suspicion for NBOMe use in any patient presenting with serotonin syndrome-like manifestations while also reporting the recent use of recreational drugs. As no antagonists currently exist, treatment for NBOMe intoxication remains largely supportive. Providers will see an increase in the number of patients presenting with serious adverse effects related to illicit drug use. Education regarding recognition and management is imperative to providing safe anesthesia care.

## **(Evidence Based - Literature Review)**

### **A Comparison of the Analgesic Efficacy and Side Effects of Paravertebral Blockade Versus Thoracic Epidural Blockade for Patients Undergoing Thoracotomy**

*Kaitlin Sanborn, BSN, RN, CCRN; Kristi Wade, CRNA, DNAP; Jessica Burton-Vigil, CRNA, MS*  
Albany Medical College Center for Nurse Anesthesiology

**Introduction:** Patients undergoing major thoracic surgery develop postoperative pain. It is difficult to treat because multiple sensory afferent fibers transmit nociceptive stimuli following thoracotomy. A literature review was conducted to investigate the analgesic effect and adverse outcomes associated with paravertebral blockade versus thoracic epidural blockade in patients undergoing thoracotomy.

**Methods:** The literature presented in this review was selected from a comprehensive electronic search of the PubMed, CINAHL, and Cochrane library databases through Albany Medical College's Schaffer Library. Key terms used for the search included pain, thoracic, paravertebral, epidural, block, thoracotomy, placement and anesthesia. Broad MeSH terms included thorax, and thoracotomy. They were selected from each database and used to identify further relevant research. Articles published between 2006 and 2016 and in the English language were included. Initially, 101 articles were identified, but only those articles investigating adult patients were selected for inclusion. Four articles are included in the final analysis.

**Analysis of the Evidence:** Four articles were included in the final analysis: Ding et al (2014), Raveglia et al (2014), Davies et al (2006), and Kobayashi et al (2013). Findings show that patients who received a paravertebral block (PVB) demonstrated fewer side effects when compared with those patients who received thoracic epidural blockade (TEB). PVB was associated with less hypotension, urinary retention, nausea and vomiting, and pruritis. Two studies also demonstrated a significant reduction in postoperative pulmonary complications in patients who received a PVB. Additionally, Davies et al and Ding et al both recorded a significantly lower incidence of failed block in the PVB group versus the TEB group.

**Recommendation for Practice:** Postoperative pain inhibits early ambulation, pulmonary recruitment, and discharge after thoracotomy. Nurse anesthetists strive to provide the safest, most effective analgesic technique for patients. While both blocks provided comparable analgesia, PVB provided a significant clinical advantage over TEB when considering adverse effects. There are fewer contraindications for PVB placement and more adverse effects with TEB. Larger, prospective, randomized trials comparing adverse outcomes of TEB to PVB for patients undergoing thoracotomy are required. Future studies should standardize placement of catheter, dosing of catheter, type of thoracotomy, and drugs and concentrations of anesthesia.

## **(Evidence Based - QI)**

### **Use of a Checklist for the Postanesthesia Care Unit Patient Handoff**

*Reed Halterman, MSN, CRNA*

Augusta University

**Introduction:** In the perioperative setting, patient care is transferred numerous times to different providers. During this transfer of care, handoff reports are used to pass critical health information to the receiving provider. With no specific guidelines in place, these handoffs can lack structure, formality, and result in key pieces of information being lost. The use of a handoff checklist is a potential solution for this issue.

**Methods:** The purpose of this literature search was to answer the following clinical question: Do adult patients admitted to the PACU who have their care transferred using a standardized handoff checklist compared with patients who were not transferred using a formal checklist have more important intraoperative data conveyed to the receiving nurse without increasing duration of handoff? The search used GALILEO, PubMed, CINAHL, Ovid, and NGC. Inclusion criteria were English language, adult population, and published between 2012 and 2017. Sixty articles were found that related to the PICOT with 7 articles selected that consisted of: 2 randomized controlled trials, 1 controlled trial without randomization, 1 systematic review of qualitative studies, 2 quality improvement (QI) projects, and 1 descriptive study.

**Analysis of the Evidence:** The literature reviewed showed that a standardized handoff checklist decreased omission of critical information. A quality improvement project was conducted to develop and implement a standardized handoff checklist. Preintervention and postintervention data were collected. With the use of the standardized handoff checklist, omission of critical health information decreased in all 5 areas measured: procedure decreased from 19% to 2%; allergies, 23% to 4%; input and output, 16% to 0%; antiemetic used, 21% to 4%; and lines, 19% to 11%. There was also a dramatic increase in the number of complete handoffs given when the tool was used, from 13% to 82%.

**Recommendation for Practice:** The use of a standardized checklist has been shown to improve the information transferred during handoff from 1 provider to the next. The goal of this project was to take that knowledge and use it to improve knowledge transfer and decrease omissions during the handoff period between the anesthesia staff and PACU staff. The project was successful in implementing a standardized checklist and echoed the success of the articles reviewed. Further education will be necessary to improve and maintain this success. Similar projects can be easily replicated in other settings, in this facility and others, to improve and deliver the best care possible for patients undergoing anesthesia care.

## **(Evidence Based - Survey)**

### **S.E.E.A.M. – Strategies for Effective Emergency Airway Management**

*Brian Estevez, BSN, RN; Jennifer Lanzillotta, MSN, CRNA; Beth Clayton, DNP, CRNA; Mary Bakis, DNP, CRNA; Meghan Johnson, MSN, CRNA*

University of Cincinnati, Nurse Anesthesia Program

**Introduction:** Predicting when an airway crisis will transpire is extremely challenging. Patients rarely present with obvious risk factors and most difficult airways are not identified until instrumentation has already been initiated. The aim of the S.E.E.A.M. project was to enhance multidisciplinary preparedness through staff education and standardization of emergency airway equipment.

**Methods:** PICOT - Does airway cart standardization and education improve clinician preparedness of emergency airway events? The literature review included peer-reviewed articles published between 2011 and 2016 in CINAHL, PubMed, Scopus, and EBSCOHOST databases. Abstracts were assessed and 131 articles were identified. Twenty-eight full-text articles were printed, read, and evaluated. Eight articles were eliminated because these did not satisfy the inclusion criteria, leaving 20 articles for the final analysis. The S.E.E.A.M. project was implemented at Highland District Hospital, a 25-bed, critical access hospital in Hillsboro, Ohio. Informed consent was waived per the IRB. OR staff voluntarily completed a pretest survey. An education module examined current airway literature, difficult airway guidelines, specific hospital policies, and the equipment stored in airway carts. A posttest survey was then administered.

**Analysis of the Evidence:** Presurvey data indicated that more than 50% of the participants were not aware of all the equipment located within the emergency airway cart. Following the education module, participants were familiar with the location of emergency airway equipment in their unit and in the facility and felt the cart was more organized. Additionally, all participants felt more prepared to assist clinicians with the placement of emergency airway devices. Not all participants completed both surveys, presurvey (n=10) and postsurvey (n=7). Qualitative feedback was positive, although some stated hands-on participation would have improved the experience. Further investigation is necessary to evaluate the S.E.E.A.M. project and its impact on emergency airway outcomes.

**Recommendation for Practice:** Securing an airway in an emergency requires skill, available equipment, and team collaboration. It is imperative that staff members know the location of emergency airway carts within their institution and feel prepared to assist clinicians during an airway crisis. Emergency airway carts should be standardized to meet the specific needs of the institution, clinicians, and patients served. Proactive approaches such as S.E.E.A.M. can increase access to airway equipment, expedite intervention times, and optimize patient safety standards.