

A Content and Thematic Analysis of Closed Claims Resulting in Death

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The analyses of malpractice closed claims conducted by the AANA Foundation Closed Claims Research Team are scientific studies of adverse anesthetic events where a Certified Registered Nurse Anesthetist was identified as potentially contributing to the outcome. From July 2013 to March 2014, the AANA Foundation Closed Claims Researchers evaluated 245 closed claims from the CNA Insurance Companies spanning from 2003 to 2012. An adverse event leading to death occurred in 87 of the claims. This article describes the use of content and thematic analysis in

the evaluation of these closed claims. The purpose of the study was to establish 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. Major themes identified include: (1) patient factors, (2) provider factors, (3) environmental factors, and (4) team/group factors.

Keywords: Certified Registered Nurse Anesthetist, closed claims, content and thematic analysis, malpractice death.

In developed countries, mortality solely attributable to anesthesia has declined greatly over time.¹⁻³ There are many reasons for this, including the introduction of modern respiratory monitoring, growing use of evidence-based practice guidelines and surgical checklists, improved selection of patients undergoing surgery, and advances in teamwork and education.³ Although anesthetic mortality has improved over time, studies evaluating the contribution of anesthesia to perioperative mortality are needed to enable further improvements in the safety and quality of perioperative care.

In the United States, the anesthesia-related mortality rate is about 1.1 per million persons per year.⁴ Because injury and mortality attributed to anesthesia is a rare occurrence, it is difficult to study prospectively or by retrospective medical record review.¹⁻³ The study of medical malpractice closed claims provides a cost-effective approach to data collection. Closed claims make available a concentrated collection of information on extremely rare events in one central location. The purpose of this article is to present themes identified through content and thematic analysis of closed claims involving Certified Registered Nurse Anesthetists (CRNAs) in which the primary outcome was death. In addition, the lessons learned and recommendations for improving patient safety are reported.

Materials and Methods

From July 2013 to March 2014, the American Association of Nurse Anesthetists (AANA) Foundation Closed Claims Research Team (CCRT) convened at the AANA headquarters and generated a database (N = 245) of closed malpractice claims spanning from 2003 to 2012. The review was conducted in collaboration with CNA Insurance of Chicago, Illinois. A descriptive analysis was conducted, and key findings were previously reported.⁵ For the present study, members of the CCRT manually queried the database for closed claims in which the outcome was death, for secondary analysis. Eighty-seven claims were identified and underwent content and thematic qualitative analysis following an established process formerly described in detail.⁶ The thematic analysis was directed at establishing 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. In addition, the dataset was exposed to standard descriptive statistical analysis using the software IBM SPSS version 22 (IBM). The CCRT included CRNAs with diverse clinical expertise from both clinical and academic settings. Table 1 depicts the steps taken in analyzing the data.

Results

Of the 87 claims, most were classified as ASA physical

Step	Action
1	Team leader conducted manual query of database for death claims
2	Team of 12 investigators reviewed claims for appropriateness of inclusion
3	Weekly, the team leader randomly assigned 2 investigators to work in pairs to code 2-3 claims
4	Weekly phone conferences were held to reach consensus on coding until saturation was reached (approximately 6 weeks)
5	Five of the 12 investigators were selected to meet face-to-face to conduct thematic analysis and identify themes in the case summary analyses
6	Consensus was reached on final themes

Table 1. Steps in Thematic Analysis of Death Claims

status class 3 (40.2%) followed by ASA class 2 (39.1%), ASA class 4 (16.1%), ASA class 1 (3.4%) and ASA class 5 (1.2%) respectively. Additionally, 6 claims (7%) were classified as “E” for emergency surgery. Most patients (69%) represented in the claims were male.

The specific events leading to death are depicted in Table 2. Respiratory events, including loss of the airway and aspiration, accounted for the largest portion (34.5%) of the death claims (30 of 87). Monetary damages were paid in 42 (48%) of the 87 claims, with a mean payout of \$307,190.95. It is important to note that claims that did not result in a monetary payout (52%) did not meet the requirements for mandatory reporting to the National Practitioner Data Bank. Of the files in which the time from the event to the time of settlement was identifiable (68%), the mean was 34.5 months. Table 3 presents data regarding the location and type of facility where surgeries were performed.

Four 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. A breakdown of the 4 themes and corresponding subthemes is provided in Table 4. What follows are case summaries that best illustrate each theme along with their affiliated subthemes. Closed claims often included events that encompassed more than 1 theme.

- **Theme 1: Patient Factors.** Patient factors comprise characteristics innate to the patient, such as preexisting conditions or comorbidities, and aspects of health over which the patient has control. Examples include a patient’s willingness to disclose information or compliance with a medication or therapeutic regimen. This theme also includes the subtheme “self-medication,” which refers to patient medication misuse or abuse. Self-medication often involved controlled substances that were not prescribed or not part of the perioperative plan. The following closed claim illustrates how multiple

Event	No. (%)
Respiratory event	
Airway loss	23 (26.5)
Aspiration	7 (8)
Cardiac event	
Cardiac arrest	15 (17.2)
Bradycardia	8 (9.2)
Myocardial infarction	3 (3.4)
Drug related	
Narcotics only	6 (6.9)
Other	4 (4.6)
Hemorrhage	9 (10.4)
Other	12 (13.8)
Total	87 (100)

Table 2. Events Leading to Death

Location	No. (%)
Hospital	58 (66.7)
Ambulatory surgical center	19 (21.8)
Office	5 (5.8)
Endoscopy center	2 (2.3)
Other	3 (3.4)
Total	87 (100)

Table 3. Type of Facility Where Event Originated

patient factors led to a patient’s death.

- **Claim.** A 26-year-old patient with a known history of drug and alcohol abuse underwent general anesthesia for a shoulder arthroscopy. In the recovery room, multiple doses of intravenous narcotic were administered to relieve pain. Once he was fully recovered, able to ambulate, and dress himself, the patient was discharged home with a prescription for oxycodone hydrochloride, 30 mg every 6 hours, for pain. On postoperative day 1, the patient was found dead surrounded by multiple bottles of prescription medications, including meperidine, oxycodone, carisoprodol, meprobamate, and promethazine. The cause of death was determined to be due to mixed narcotic use, pulmonary edema, aspiration, and pneumonia.

In this claim, the patient factors identified as contributing to death include lack of disclosure and self-medication. Although this patient had a known history of drug and alcohol abuse, he did not disclose the number and types of medications he was using and misusing. Following discharge, the patient self-medicated with a combination of substances leading to pulmonary edema, aspiration and death.

- **Theme 2: Anesthesia Provider Factors.** Common anesthesia provider factors identified by the CCRT included inappropriate responses, knowledge deficits,

Theme	Definition	Subthemes
Patient factors	What is innate to the patient and what the patient has control over	<ul style="list-style-type: none"> • Preexisting conditions • Lack of disclosure • Self-medication
Anesthesia provider factors	CRNA	<ul style="list-style-type: none"> • Knowledge deficit • Inappropriate response • Communication failure • Failure/inability to obtain information regarding patient
Environmental factors	Circumstances, objects, or conditions by which one is surrounded	<ul style="list-style-type: none"> • Setting • Adequate resources • Equipment
Team/group factors	Individuals interacting to provide patient care	<ul style="list-style-type: none"> • Situational awareness • Communication failure • Shared liability • Transfer of care • Normalization of deviance • Knowledge/skills/qualifications of team members

Table 4. Major Themes and Related Subthemes

Abbreviation: CRNA, Certified Registered Nurse Anesthetist.

communication failures, and the failure or inability to obtain pertinent information. The following claim illustrates many of these factors.

• *Claim.* A 70-year-old patient presented to the emergency department (ED) with a large tracheal mass just above the vocal cords causing obstruction of approximately 95% of the laryngeal/pharyngeal aperture. The patient was scheduled for emergency surgery and was transferred to the operating room for an emergency tracheostomy to be performed using a local anesthetic and sedation. Midazolam, 2 mg, was administered in divided doses, and oxygen (O₂) was provided via simple mask at 6 L/min. During the use of electrocautery, a flash fire ignited. The patient sustained second-degree burns to the face, neck, ears, upper aspect of the chest, and right shoulder and later died of complications related to the burns.

The anesthesia provider factors identified in this claim include failure to communicate and knowledge deficit. The surgeon and CRNA did not communicate and coordinate care during electrocautery. Continuous high-flow O₂ was administered near an ignition source. In addition, the CRNA demonstrated a lack of knowledge or disregard for recommendations to keep the fraction of inspired O₂ as low as clinically feasible when an ignition source is in proximity to an O₂-enriched atmosphere.⁷

In many of the claims, the anesthesia provider's response was inadequate or inappropriate. Inappropriate responses were often the result of cognitive errors, which are thought-process errors, or thinking mistakes, that lead to incorrect diagnosis or treatments or both.⁸ This phenomenon is demonstrated in the following claim.

• *Claim.* A 54-year-old patient presented for a cholan-

giopancreatogram. After induction of general anesthesia and placement of an endotracheal (ET) tube under direct laryngoscopy, the presence of bilateral breath sounds and end-tidal carbon dioxide (ETCO₂) was verified. The patient was transferred from the stretcher to the procedure table and placed in the prone position. Following the move, the CRNA noted that the electrocardiogram (ECG) tracing was absent and the arterial oxygen saturation (SaO₂) reading was erratic. The ECG pads were replaced, followed by the wires. Detecting no tracing, the CRNA palpated the carotid pulse at 30/min and determined the patient had no detectable blood pressure. Glycopyrrolate was administered, and the patient was turned supine to begin cardiopulmonary resuscitation (CPR). With the patient supine, it was discovered that the ET tube was in the oropharynx and the patient was not being ventilated. The patient was reintubated, resuscitated, and transferred to the intensive care unit where she remained in a coma and unresponsive until death 23 days later.

In this claim, the CRNA fixated on one issue at the expense of comprehending the whole situation. The ECG and SaO₂ changes were a response to hypoxia and lack of ventilation and not faulty lead placement or equipment. Although the presence of ETCO₂ was documented after endotracheal intubation, no further mention of it was identified in the claim. Cognitive error led the CRNA to inappropriately respond to the clinical presentation. In this case, the result was an incomplete assessment and failure to obtain vital patient information needed to make an accurate diagnosis.

The reviewers found that communication failure at some point during the perioperative period was central to many of the claims. These failures were the result of mis-

communication on the part of the individual anesthesia provider as well as teams or groups. The following claim demonstrates a communication breakdown between a CRNA and a surgeon.

- *Claim.* A 74-year-old patient presented for insertion of a surgically implanted intravascular port under monitored anesthesia care. During the procedure, bradycardia developed, and SaO₂ and blood pressure declined. The CRNA began to manually provide 100% O₂ and positive pressure ventilation but did not inform the surgeon of the changes until he inquired about the patient's condition after noticing the blood was dark. In addition, the surgeon did not inform the CRNA that the port placement was difficult. The patient became unresponsive, and CPR was initiated. The patient's hemoglobin level was found to be 5.7 g/dL. Despite efforts to resuscitate the patient, including insertion of chest tubes and the administration of multiple units of blood, the patient died shortly after arrival in the recovery room.

In this claim, the surgeon and the CRNA were operating in silos, each unaware of the actions of the other. Both failed to communicate vital information regarding the status of the patient.

- **Theme 3: Environmental Factors.** The researchers defined environmental factors as "the circumstances, objects, or conditions by which one is surrounded". Subthemes include setting and availability of adequate resources and equipment. The availability of resources is an important consideration when determining a patient's suitability or fit for the environment in which surgery is planned. The following claim demonstrates an environment that lacked the necessary equipment and resources needed to provide safe care.

- *Claim.* A 36-year-old morbidly obese woman (BMI > 50 kg/m²) underwent a transvaginal oocyte retrieval under local anesthesia and sedation in a freestanding clinic. The patient had multiple comorbidities, including noninsulin-dependent diabetes, pulmonary restriction/obstruction, suspected history of obstructive sleep apnea (OSA), and hypertension. The patient was sedated with midazolam, fentanyl, and propofol in divided doses intravenously. After positioning the patient in lithotomy, the obstetrician was unable to visualize the field. The circulating nurse responded by positioning the patient's legs over her shoulders. During repositioning, the patient was noted to "buck". The CRNA was unable to ventilate the patient and attempted to intubate several times. Disposable capnography was used to verify correct ET tube placement. Although the color did change after the first attempt, the patient's SaO₂ and heart rate continued to decline. Emergency medical services (EMS) were called while additional attempts were made by the CRNA to ventilate and secure the airway. An esophageal tracheal airway (Combitube) was placed by EMS during transit to the ED. The patient died shortly after arriving in the ED.

Multiple environmental and patient factors were identified when reviewing this claim. The patient was

morbidly obese with substantial comorbidities, making a freestanding clinic an unsuitable environment. The facility did not have the equipment needed to manage a difficult airway, measure ETCO₂, or provide mechanical ventilation. In addition, the facility was not equipped to properly position a patient of such extreme body habitus.

- **Theme 4: Team/Group Factors.** Theme 4 consisted of team/group factors. The "team or group" was defined as individuals interacting to provide patient care. Subthemes identified as contributing to death include loss of situational awareness, communication failure, shared liability, transfer of care, normalization of deviance, and lack of knowledge, skills, or qualifications. The following claims illustrate how these factors played a part in team dynamics that led to patient death.

- *Claim.* A 66-year-old patient with a history of smoking and advanced pulmonary disease underwent surgery to remove a vocal cord polyp. Following an uneventful surgery, the neuromuscular blockade was reversed and the patient was able to follow commands. Approximately 5 minutes after extubation, the patient began to indicate trouble breathing. The CRNA applied supplemental O₂ via mask. The patient continued to deteriorate, prompting the CRNA to call for help and assist ventilation with positive pressure and 100% O₂ via bag and mask. When the patient became apneic and unable to ventilate, the CRNA administered succinylcholine and reintubated. Following reintubation, the SaO₂ began to rise. An anesthesiologist responded to the call for help and confirmed the presence of bilateral breath sounds. Despite this, the anesthesiologist removed the ET tube and reintubated the patient. The rationale given was that the ETCO₂ waveform was weak. Following reintubation, the CRNA auscultated the lungs and notified the anesthesiologist that breath sounds were absent. Bradycardia developed, and CPR was initiated. The surgeon returned to the operating room and assessed placement of the ET tube with a fiberoptic bronchoscope, confirming the esophageal placement. He performed an emergency tracheostomy, and ventilation was reestablished. The patient later died of complications related to anoxic brain injury.

The team/group factors identified in this scenario include failed communication, loss of situational awareness, and shared liability. Communication concerning the success or failure of securing the airway was discounted several times. An improving SaO₂ after the first reintubation was dismissed, and signs of a failed second reintubation were rejected. Use of a fiberoptic bronchoscope to assess the airway delayed appropriate treatment. The breakdown of communication in this team resulted in information loss and degraded information sharing. The team exhibited loss of situational awareness, as evidenced by errors in the patient's management. Finally, this claim was similar to others found in the dataset in that the CRNA was named, even though the care the nurse anesthetist personally provided was deemed appropriate by the CCRT.

Analysis of the closed claims revealed that the mishandling of handoffs and transfer of care contributed to events that led to patient death in several cases. An example of a failed transfer of care was found in the case of a parturient who received epidural anesthesia for a cesarean delivery and postoperative pain management.

• *Claim.* A 22-year-old morbidly obese woman with a history of OSA labored for 12 hours with an epidural block that was placed without difficulty. Following the delivery of a healthy infant, the epidural anesthetic was dosed with 5 mg of preservative-free morphine. Within 5 minutes after administration, the patient's SaO₂ decreased into the 70% range, and she began exhibiting signs of airway obstruction and excessive somnolence. High-flow O₂ was administered, and she was transferred to the postanesthesia care unit (PACU), where her SaO₂ slightly improved. The obstetrician was notified of the patient's response and agreed to write orders for a pulmonary consult but never followed through. The CRNA wrote the orders for the consult and for monitoring according to the hospital's protocol for patients receiving a neuraxial opioid. The orders included assessment of respiratory rate and SaO₂. The patient was transferred to an obstetric unit, where she later died. It was noted that 2 hours elapsed between nursing assessments before her death. Anoxic brain injury with a secondary finding of right ventricular hypertrophy was identified as the cause of death.

The patient's history of OSA and morbid obesity placed her at increased risk of respiratory depression. The CCRT found the dose of morphine administered was within guidelines but agreed it was high for an obese patient with known OSA. Given the patient's history and presentation, the additional methods required for the prevention, detection, and management of respiratory depression associated with the administration of neuraxial opioids were beyond the capabilities of the obstetric unit to which she was transferred.⁹ In addition, there was inefficient or absent follow-through in arranging appropriate follow-up care for this patient.

Normalization of deviance is another subtheme associated with team/group factors identified by the reviewers. This phenomenon is one in which individuals, teams, and organizations repeatedly drift away from what is an acceptable standard of performance until the "drift" becomes the norm.^{10,11} In the following claim, a patient was transferred to a recovery facility lacking personnel with the requisite knowledge, skills, or qualifications to safely recover a complex patient.

• *Claim.* A 50-year-old patient underwent cosmetic surgery that included liposuction of the back, neck, thighs, flank, arms, knees, and fat transfer to the face. The patient had extensive tumescent liposuction with more than 6 L of aspirate removed. Following surgery and recovery in the PACU, the patient was discharged to a facility known as a retreat that employed unlicensed individuals to provide overnight care. While in the retreat, the patient received

hydrocodone for pain and a sleeping pill from an aide. Later the patient was found nonresponsive, and 911 was called. The autopsy revealed the cause of death to be hypertrophic cardiomyopathy. Other remarkable findings included hepatic stenosis and acute multiple drug intoxication.

Multiple factors (patient, provider, environmental) contributed to the patient's death, including the team factor, normalization of deviance. Numerous comorbidities and a large amount of aspirate removed during surgery placed the patient at increased risk. Complications are known to increase with removal of greater than 4 to 5 L of fat.¹² In addition, transferring patients to a "retreat" or "spa" under the care of unlicensed personnel is a deviation from AANA Standard VII, which requires that care is transferred to another qualified healthcare provider in a manner that assures continuity of care and patient safety.¹³

Discussion

The purpose of this study was to identify common themes through content and thematic analysis of closed claims in which the primary outcome was death. The analysis revealed 4 major themes (patient factors, anesthesia provider factors, environmental factors, and team/group factors) as well as numerous associated subthemes.

Many of the themes and corresponding subthemes shared vulnerabilities in communication that resulted in catastrophic outcomes. Nondisclosure was a recurring subtheme identified as a patient factor that led to poor outcomes. This term refers to the failure of patients to provide important health information such as preexisting conditions and past medical or surgical histories. In the claims reviewed, patients also failed to disclose major events such as a history of a difficult intubation or allergies to anesthetic agents. Patients may not disclose important medical health information for a variety of reasons, including lack of understanding medical terms, unwillingness to answer, lack of knowledge of various conditions, answering to please the clinician, forgetfulness, different perceptions of health and illness, and fear that certain responses will cause the case to be canceled.¹⁴

Patients also failed to communicate important information about the medications they had taken or planned to take during the perioperative period. The reviewers termed this behavior self-medication. Particularly troubling was the failure to communicate self-medication with opioids and other controlled substances, which was found to contribute to catastrophic outcomes in multiple claims. The closed malpractice claims reviewed spanned from 2003 to 2012. It is well known that our nation is currently in the midst of an unprecedented opioid epidemic.¹⁵ Findings from this study suggest that the misuse and abuse of drugs posed a major risk of perioperative mortality before the epidemic was widely publicized. All anesthesia providers should discard the notion that addiction and dependence is a rare consequence of long-

Lesson 1: Effective Communication Is Vital to Patient Safety

Employ “SBAR”,²² which provides a common and predictable structure to the communication.

SBAR stands for *situation* (what is going on with the patient?), *background* (what is the clinical background or context?), *assessment* (what do I think the problem is?), and *recommendation* (what would I do to correct?).

Use appropriate assertion:

- State the problem politely and persistently until you get an answer.
- Don’t “hint and hope.”
- Focus on the problem and avoid the issue of who’s right and who’s wrong.

Adopt critical language:

- Derived from the CUS program at United Airlines. It stands for “I’m *concerned*, I’m *uncomfortable*, this is *unsafe*, or I’m *scared*.”
- Adopt within the culture as meaning, “We have a serious problem; stop and listen to me.”

Improve situational awareness:

- Refers to the care team maintaining the “big picture” and thinking ahead to plan and discuss contingencies.
- Should include ongoing dialogue, which keeps members of the team up to date with what is happening and how they will respond if the situation changes.

Participate in debriefing:

Spend a couple of minutes after a procedure or at the end of a day to assess what the team did well, what were the challenges, and what team members will do differently the next time.

Lesson 2: Not All Patients Are Suitable for Surgery in Remote or Office-Based Locations

Adhere to the AANA Standards for Office-Based Anesthesia Practice, which establish a common base for the delivery of high-quality patient care in these environments.²³

- Consider the condition of the patient and the planned surgery in determining if there are appropriate resources to manage various levels of anesthesia.
- Develop policies that address patient selection criteria, monitoring equipment, availability of adequate numbers of well-trained support personnel, and the ability to treat foreseeable complications.

Lesson 3: Difficult Airways Can Be Encountered at Any Point in the Perioperative Period

- Patients with obstructive sleep apnea are at increased risk of perioperative complications, including postdischarge death.
- Assess early for causes of hypoxia when bradycardia develops.
- Continuously monitor ventilation and oxygenation and be vigilant in recognizing imminent respiratory adverse events during all anesthetics.
- Use end-tidal capnography to monitor ventilation, which is particularly important, because oxygen saturation is slow to decrease in the presence of supplemental oxygen.
- Adhere to the ASA Difficult Airway Algorithm.²⁴

Table 5. Lessons Learned and Recommendations to Improve Patient Safety

Abbreviations: AANA, American Association of Nurse Anesthetists; ASA, American Society of Anesthesiologists.

term opioid therapy. Greater emphasis should be placed on assessing patients who may be at risk of abusing substances and educating them about the danger of self-medicating during the perioperative period.

Communication failure was also identified as a sub-theme of “provider factors”. The Joint Commission has determined that miscommunication is the third leading root cause overall of sentinel events in healthcare.¹⁶ In addition, communication failures are the second largest contributor to sentinel events associated with perioperative complications and transfer-of-care-related events.¹⁶ Causes of communication failures in healthcare are varied. For surgical teams, a problematic pattern of communication that has been observed in the operating room is silence.¹⁷ Forms of silence include absence of communication, not acknowledging or responding to a colleague’s requests or questions, and quiet or hesitant speech.¹⁷

Studies examining the impact of communication on the culture of safety in operating rooms have revealed that a hierarchical environment frequently exists among

members of the surgical team.¹⁷ Team members may not be empowered to disclose concerns, speak up, and stay focused because of tacit hierarchical boundaries. Even though team members may be able to articulate the importance of “speaking up” to voice concerns, they fail to do so because of fear of being belittled or denigrated by those they perceive to have higher professional stature.¹⁷ In several of the claims, the researchers identified that the CRNA felt something was not quite right but did not speak up or persist and hold his or her ground. It is possible that perceived hierarchical boundaries prevented individual CRNAs from feeling empowered and advocating or intervening when they knew things were not acceptable.

Communication failures were also found to contribute to transfer-of-care-related events involving the team or group. Many barriers to providing effective and safe handoffs have been identified.^{18,19} In the claims reviewed, production pressure and goal conflicts between providers were examples of barriers that had an impact on the quality of communication during transfer of care.

Providers with different specialties or experience levels do not always share the same expectations about diagnosis and management of patients, which can serve to obstruct mutual understanding.²⁰

Another factor contributing to death was the environment. One-third (N = 29) of the claims reviewed involved patients who had procedures or surgery outside a hospital environment. Outpatient facilities pose potential risks, which fall into 2 categories: setting and the individuals working in those settings.²¹ With respect to setting, inconsistencies in how facilities are regulated, reporting of adverse events, and the relative isolation of the solo practitioner can pose problems.²¹ The equipment available in a particular setting may pose risks as well if it is outdated, inadequately maintained, or unavailable. Some of the claims involved patients who were transferred from freestanding or office-based surgical settings to recover in unregulated environments. These outpatient settings employed nonmedical personnel who did not have the education or skills necessary to identify or manage emergencies, leading to catastrophic results.

Events leading to death were also the result of inappropriate responses by the providers. Inappropriate responses are often due to critical errors in thinking and have been labeled as cognitive errors.⁸ Cognitive errors are errors in thinking that are usually the result of unconsciously held biases made in conjunction with failed analyses of clinical presentations.^{8(p230)} These errors are made despite the availability of knowledge and data needed to make the right the decision.⁸ Even the most qualified anesthesia providers may fall prey to this form of faulty thinking. Fourteen types of cognitive errors that are thought to contribute to medical errors in the practice of anesthesiology have been identified.⁸ For example, confirmation bias is evidenced by seeking or acknowledging only information that confirms the desired or suspected diagnosis.

Finally, the closed-claim review revealed multiple instances of individuals or, more often, teams deviating from known standards of care. The reviewers identified this drift from accepted standards as normalization of deviance. Normalization of deviance represents a break in safety culture.¹⁰ In its place, a slippery slope develops of accepting more and more risk and deviating from the standard of care. Over time, as the behaviors become ingrained, the result is a mindset that demands evidence that these behaviors will harm the patient vs demanding proof that they will not.¹⁰ As seen in this closed-claim review, harm causing medical errors is rarely the result of a single individual doing something incomprehensively foolish. Rather, major accidents require multiple people, committing multiple, often seemingly innocuous mistakes that breach an organization's fail-safe mechanisms, defenses, or safety nets.¹¹

There are key lessons to be learned from the review of

closed claims in which the primary outcome was death. Table 5 presents the lessons learned and recommendations for improving patient safety.²²⁻²⁴

Although the use of closed claims represents a cost-effective method of studying rare anesthetic complications, this approach includes inherent limitations. In review of the study documents, frequently descriptions of the claims were limited in extent, and details were not always complete. For this reason, the researchers were rigorous in avoiding inference to classify or interpret data and restricted themselves to the extracted information from the claim descriptions. Furthermore, the data were retrospective, and thus variables were not assessed in their natural setting. Additionally, closed claims represent only a subset of adverse outcomes (ie, claims are not filed by all patients who are injured—or in the case of death—by the family). Finally, the incidence and risk of anesthesia-related adverse outcomes is unknown because of the lack of a numerator representing the total number of adverse events and a denominator representing the total number of anesthetic procedures performed.

Conclusion

The AANA Foundation CCRT 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 identified as contributing to events leading to death include patient, provider, environmental, and team/group factors. The data derived from analysis of these claims exposed important and previously unappreciated aspects of adverse outcomes in cases involving CRNAs.

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