The “second victim” phenomenon—when a healthcare provider experiences adverse events because of the adverse events of a patient—is not well known or understood among healthcare professionals, including Certified Registered Nurse Anesthetists (CRNAs). No published research is currently available on the impact of second victim specifically in CRNAs, but it is known that second victim poses major challenges for healthcare professionals. Therefore, it is important to acknowledge its occurrence and to develop an educational curriculum based on the available evidence in order to promote peer and organizational support infrastructures. A comprehensive literature review was conducted, 6 educational domains on second victim were developed, and an expert panel validated the content.

**Keywords:** Anesthesia, adverse events, second victim.

The first providers of anesthesia in the 19th century, Certified Registered Nurse Anesthetists (CRNAs), continue to be the principal providers of anesthesia, administering every type of anesthetic and providing care for every type of surgery and procedure. Nearly 47,000 CRNAs administer more than 34 million of the estimated 40 million anesthetics per year in the United States, accounting for approximately 85% of all anesthetics rendered. Additionally, CRNAs are the sole anesthesia providers in most rural hospitals; in some states, CRNAs are the sole anesthesia professionals in nearly 100% of rural facilities.

Historically, CRNAs rendered anesthesia alone in the 19th and 20th centuries because they were the most knowledgeable and experienced pioneers in the field. As entrepreneurs in anesthesia delivery for centuries, CRNAs have endured stressful factors of the evolving profession and adapted to sundry situations from the times of open-drop ether to the now more current, advanced, and innovative practice trends. Every day, CRNAs swiftly handle perioperative crises. However, according to Clegg and MacKinnon, little to no training occurs in the actual management of intraoperative morbidities or death, including the aftermath of such events. This is alarming because other stressful occupations, such as pilots, firefighters, and police officers, have education about the expected stressors and potential catastrophic events that can and do occur.

A 1 in 200,000 chance exists for a death in the operating room, with many variables that can contribute to negative outcomes. When situations unexpectedly or even expectedly go awry, CRNAs might be prone to the lasting effects of second victimhood. Fellow CRNA colleagues may have apathy or may not completely understand the overwhelming natural feelings related to such tragic events if they have not experienced second victimhood themselves. However, virtually every healthcare provider who experiences harm to or loss of the patient (the first victim) feels devastated and singled out, agonizes and perseverates over the event, hesitates about having discussions with colleagues, questions his or her competence even after years of training and experience, questions potential punishment and job security, fears the patient’s anger and the family’s scorn, laments about apologizing to the patient and family, and continues to feel tormented. All these factors might seem far worse when one considers the human aspects of nurse anesthesia and the role of the nurse anesthetist as protector and advocate for the patient in the operating room.
In 1956, another article was published about the horrible memoir of an operating room death, with risks attributed to anesthesia and consequences to the anesthetist. In 1990, the term vicarious traumatization was coined and introduced as a theory exploring mental health professionals’ own experiences of the traumatic psychological events their patients endured.

The concept of second victim is not widely acknowledged in healthcare systems. Nevertheless, the phenomenon is not new. Dr Albert Wu, a physician, coined the term second victim in the year 2000 when he discussed medical errors made by physicians and the negative impacts suffered. The term second victim is used in the literature to describe not only physicians but also nurses and other healthcare personnel who experience adverse events with their patients. Currently, to the authors’ knowledge, there are no published studies concerning second victimhood and nurse anesthetists. Based on the literature, little data are known about the impact of perioperative catastrophes on American anesthesiologists, and the effects of catastrophes on subsequent patient care in the aftermath are poorly understood.

Stress in Anesthesia. In 1981, Edgar Ansel described how being a nurse anesthetist must be one of the more stressful occupations in the entire world. The scope of responsibilities, work schedule, and acute split-second decisions required in anesthesia add to the physical and emotional stress experienced by CRNAs who already live and work in stressful environments. Training reinforces resiliency to work through tough situations and tumultuous cases, but this can become profoundly difficult when the provider is traumatized by a bad event. The bad event could have been years ago, yesterday, or this morning. Perioperative catastrophe covers a broad spectrum of events and can be multifactorial. The catastrophic event may be the perceived and lived stressful experience that engenders feelings of second victimhood for the affected provider. The experience of losing a patient in the operating room may be exacerbated by assuming care of the next patient and being overwhelmed with worry over what might happen during the next anesthetic course. Operating room deaths have profound and personal effects on nurses, especially nurses who administer anesthesia.

This life-altering event may lead to professional paralysis, which may leave a competent practitioner unable to work proficiently or to reach his or her potential because of the fear of experiencing another adverse event. Affected individuals, peers, and departmental leadership may have difficulty realizing the impacts and unintended consequences of the ordeal, but the aftermath of the event can lead to many afflictions. Although human bereavement processes and coping repertoire are part of the life and death cycle, there is a need to succinctly characterize the second victim plight and operationalize second victim support in healthcare systems. The lack of translational and meaningful support systems, at the peer level and above, further contributes to the psychological aftermath experienced, such as professional isolation and suicidal tendencies. Because useful, meaningful support for affected CRNAs is not commonly available or understood, the rarely existent support structures may be poorly accessed or not well utilized. Unfortunately, anesthesia providers are at risk of punishing themselves harshly in the wake of perceived failures with memories of the errors for years.

Consequences of Second Victim. The second victim phenomenon is complicated. Not only is the second victim viewing himself or herself as a problem, but also the organization (third victim) may not want to deal with the second victim’s issues. The second victim may experience 1 or more of 3 outcomes: (1) survive, (2) thrive, or (3) drop out. More research could help explore and understand why some practitioners thrive and return to work strong and resilient vs why some lean toward outcomes such as professional paralysis, dropping out, or disappearing, and in the worst cases commit suicide. The dropout option is the consequence of the barriers created by severe second victim feelings of guilt, shame, and self-blame, which lead to professional paralysis and the inability to cope in the necessary occupational framework.

Anecdotes, surveys, personal commentaries, and literature reviews all constitute the evidence revealing that those involved in medical errors or adverse events suffered posttraumatic type syndromes described as an array of psychological distress symptoms. The associated feelings and symptoms have been described as denial, guilt, decreased performance, anxiety about committing more errors, loss of confidence, vulnerability, substance abuse tendencies, disrupted sleep patterns, need for recovery time, reduced job satisfaction, weakened reputations, permanent scars, increased burnout trajectory, and career exodus. Institutions and individual practitioners must acknowledge second victimhood, including the potential acute and downstream personal, professional, and organizational impacts. The issue will not enhance patient safety if not addressed. Social and institutional failings can be mitigated by better understanding the lived experience of the second victim.

National and international incidence rates of second victim experiences vary across the literature. In 2007, the University of Missouri Healthcare system reported that almost 1 of 7 staff members were involved in patient safety events that led to personal problems such as anxiety, depression, and questions about competence. Scott and colleagues also had data that revealed 68% of University of Missouri Healthcare staff reported no institutional support, 30% of healthcare personnel experienced anxiety and/or depression over a 12-month period related to a patient safety event, and 15% contemplated leaving their chosen profession. Greater than 196,000
healthcare providers are affected by medical errors each year, with 53% of providers reporting no emotional support offered after an adverse medical event and 11% offered support only after specifically requesting it.27

More globally, according to a questionnaire survey of Nigerian anesthetists, 86% of the respondents had psychological afflictions from perioperative catastrophes leading to unpleasant memories, depression, sleep disorders, guilt, desire to not return to work, and even physical manifestations such as cardiac dysrythmias.24 In Great Britain, 92% of practicing anesthetists experienced an intraoperative death in their career.33 In 2012, a survey of anesthesiologists in the United States revealed that 84% of respondents experienced at least one unanticipated death or serious event in their career; 70% experienced guilt, anxiety, and reliving the event; 88% required time off for recovery; 19% never recovered; 12% made career changes; and 67% felt their ability to provide safe anesthesia afterward was compromised; however, 7% reported being given time off.15

• A Proposed Solution. The Institute for Healthcare Improvement acknowledges that healthcare organizations lack response plans for adverse events,34 yet organizational involvement to set the conditions for success are essential for employees and patient stakeholders. Social support measures ameliorate the short-term and long-term impacts of second victim issues because social support is the most important factor in determining whether a clinician will drop out of practice, survive the experience, and ultimately thrive from the lessons of the lived experience.6 Because no currently known education about second victim exists in anesthesia training programs and many organizations also lack policies or programs to address second victim, the issue might be approached after the incident if at all or it becomes an afterthought.14 After the incident is not an ideal time to begin thinking about a response or educating the affected provider surrounding the impact. Often, support might be vague, forgotten, and lacking in clear processes.14 The patient safety movement in healthcare is becoming increasingly more aware that to err is human, and evidence-based improvement initiatives are necessary to help providers who experience adverse events.27 Education is paramount before the implementation of second victim support measures. An evidence-based, strategic educational program with clear objectives can set the conditions to successfully build a sound, thoughtful, tactical plan in the event of a second victim occurrence.

The quandary is why more CRNAs and anesthesia departments, in general, are not learning about the second victim problem. The proposed solution is an evidence-based curriculum for CRNAs. The curriculum outline was developed with 2 specific aims: (1) to identify content for an educational program on second victim for nurse anesthetists through a systematic review of the scientific literature and (2) to validate the content for an educational program on second victimhood using a panel of experts on second victim in healthcare.

Methods
The design of an evidence-based second victim curriculum for CRNAs was conducted from February 7, 2014, through August 9, 2014. It encompassed 2 steps: (1) a comprehensive literature review and delineation of the content domains, and (2) content validity by an expert panel with content validity analysis.

In the first step, a systematic review of the literature yielded 24 articles. The articles were retrieved from medical, patient safety, and health quality journals. The literature on the definition and major components of second victim phenomenon, its prevalence and sequelae among healthcare providers and nurses, and strategies for preventing and addressing second victim effects were systematically reviewed and stratified to identify content for an educational program. Search terms used were second victim, second victim in healthcare, second victim in nursing, adverse events in healthcare, second victim in anesthesia, adverse events in anesthesia, anesthesia mishaps, stress in nurse anesthesia, loss of a patient, operating room death, and critical incident management. Exclusion criteria included resources that lacked improvement recommendations on how to better acknowledge and address the second victim experience. Search engines used included Orbis Yale University Library Catalog, Cumulative Index to Nursing & Allied Health Literature (CINAHL), PubMed, Ovid, The Cochrane Library, EBSCOhost Research Databases, and Google Scholar. Resources and support included Yale University’s library system and voluntary and confidential collaboration with professional peers and mentors on the second victim topic. The evidence was organized and presented in a table that described the author, journal, place of publication, title, purpose of study, identified content, and level of evidence. The identified content was then written as elements of the educational program, and these were grouped into categories. A curriculum outline was developed based on the review of the literature and stratification of evidence. Six domains were identified as broad categories with specific subdomains under each of the broad categories.

The second step was to validate the content for an educational program on second victim using a panel of experts. A 5-member expert panel, according to the Yale School of Nursing Doctor of Nursing Practice program guidelines for expert panel methodology, validated the content identified in step 1. The expert panel (Table 1) included doctoral-prepared researchers and clinicians in medicine, nursing (RN and CRNA), and psychology, all with expertise in the second victim phenomenon in healthcare. They were identified through their prominence in the literature, selected with the deliberate in-
A rating guide was developed for relevance, clarity, and importance. The project committee members reviewed the rating guide and helped develop rating content for the expert panel per the established guidelines. The categories and specific content were then organized into a binary rating guide for relevance and importance for second victim educational goals in nurse anesthesia. A short letter was sent to each of the 5 participating experts with the curriculum outline and coinciding binary survey form for rating the curriculum content. The experts reviewed and rated the categories and elements for relevance and importance using the developed rating guide and returned the surveys within 2 weeks. The percentage of agreement for the categories and elements were calculated. The categories and elements with more than 78% agreements were judged as evidence-based content. No institutional review board approval was necessary for this project because it was a literature review to design an educational program, using professional experts to validate the content. The elements for the educational program rated by the experts are presented in Table 2.

**Results**

The systematic review revealed 6 broad domains: (1) define and describe second victim, (2) second victim risks for nurse anesthetists, (3) barriers for the second victim, (4) unintended consequences of second victim, (5) evidence-based understanding and interventions frameworks, and (6) support systems. There was 100% agreement on the relevance and importance of these 6 domains. This unanimous rating on these domains by the experts underscores their importance and inclusion as basic core content for CRNAs. In the definition domain, there was 100% agreement on the relevance of the subdomains, but 2 experts scored the history as low importance. Most of the subdomains also were rated 100% relevant, and the remaining ones were rated 80% relevant. Similarly, most of the subdomains (n = 15) were rated 100% as high importance, and 9 subdomains were rated 80%.

Four subdomains were rated as low importance: history of second victim, Denham’s Five Rights, Scott’s Recovery Stages, and survive/thrive/dropout. Expert reviewers reported that they rated these subdomains of low importance only as a way of prioritizing the content if decisions needed to be made to meet time constraints for educational offerings.

**Discussion**

Although no research specifically addresses second victim phenomena for CRNAs, there are data and literature to support the identification of content for the development of an educational curriculum for CRNAs and student registered nurse anesthetists (SRNAs). The content represents the basics to help increase knowledge on second victim, its consequences, potential interventions to cope, and support systems needed. Five national experts confirmed the evidence and substantiated the importance of preparing CRNAs for the full responsibilities of their role.

Social support expectations by CRNA peers are difficult when didactic content related to stress, burnout, second victim, and coping strategies is not required during nurse anesthesia training or in continuing education offerings. Perhaps such educational content should be required. The lack of recognition and response to second victim stands in contrast with other safety-critical disciplines where occupational stress may arise from second victim syndromes. Air traffic controllers, commercial aviators, firefighters, and law enforcement officers have response programs in place ready to offer support in a second victim critical incident phenomenon. The Institute of Medicine report *To Err is Human* revealed that although medical errors are more common than airline accidents, the public has more concern with safety in the airline industry than the
healthcare industry.37

Second victim education is beneficial in both research and clinical practice. More research about second victimhood among CRNAs is recommended in exploring educational content even more specific to the population. To date, there are no publications on second victimhood among American CRNAs. Also, there is no standardized program to implement knowledge dissemination about second victim in nurse anesthesia. The second victim curriculum outline (see Table 2) was developed to incorporate domains and subdomains that reflect the multi-dimensional impacts of the second victim phenomenon existent in the literature.

The second victim curriculum can be used as follows:
1. Educate CRNAs and SRNAs about second victim.
2. Acknowledge and address the second victim phenomenon among new graduate and student nurse anesthetists who experience abuse by staff, faculty, and pre-

<table>
<thead>
<tr>
<th>Domains and subdomains</th>
<th>Is the category relevant? (% agree)</th>
<th>Is the category important? (% agree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Define and describe second victim</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Definitions</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>b. History of second victim</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>c. Examples of second victim</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>d. Incidence</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1. Healthcare</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2. Anesthesia</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>II. Second victim risks for nurse anesthetists</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Stressful profession</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>1. Everyday risks/adverse events in a routine case</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>2. Expected death vs unexpected death</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3. Complex cases, high-risk cases, emergencies, pediatrics, obstetrics</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>4. Predicted vs unpredicted difficult airway</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>b. Factors surrounding case, patient, history, expectations (just culture)</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>III. Barriers for second victims</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Lack of recognition/respect for the issue</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>b. Peers, department, institutional barriers</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>c. Lack of support systems</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>d. Lack of knowledge about existing support systems</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>IV. Consequences of second victim</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Personal</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>b. Professional</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>c. Environmental</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>V. Evidence-based understanding and interventions frameworks</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Denham’s Five Rights</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>b. Critical incident stress management/critical incident stress debriefing</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>c. Scott’s Recovery Stages</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>1. Survive, thrive, dropout</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>VI. Support systems</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>a. Scott’s Three-Tiered Model of Support</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>b. Peer</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>c. Departmental and institutional</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>d. National</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>1. Medically Induced Trauma Support Services (MITSS)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2. AANA Health and Wellness and Peer Assistance</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Domains and Subdomains for a Second Victim Education Curriculum

aPercentage agreement is calculated as number responding “yes”, divided by the number of experts responding (n = 5). This is equivalent to the Item Content Validity Index (I-CVI), for which the proposed standard is 0.78.38
ceptors specifically during times when support should be rendered.

3. Provide a standard for an evidence-based curriculum guide to construct educational offerings on second victim.

4. Start the impetus for interventional studies and measure the effect of educational offerings and implementation plans to promote better understanding of peer and support protocols.

5. Function as part of required content in nurse anesthesia training curriculum. Clinically, the second victim educational curriculum could be used as a content guide with the use of all items to determine second victim knowledge in a pretest and posttest fashion, and individual items can be examined to determine baseline knowledge and postintervention knowledge attainment. Ease and accessibility of an available curriculum program fosters the ability for CRNAs and departmental leadership to create educational opportunities without the cumbersome and time-consuming efforts to create such a program from the ground up.

Consensus from the literature and the expert panel supports the multidimensional knowledge dissemination about second victim. Therefore, the inclusion of multiple second victim domains as components of an educational program is warranted by the literature. Further experimental and translational implementation of the educational program would provide additional evidence on the impact of strategic and tactical benefits of second victim support programs across institutions.

Conclusion

This evidence-based project substantiates the need for second victim educational programs for current and prospective CRNAs. Downstream development and dissemination of such an educational program across academic and clinical settings have the potential to increase awareness, compassion, empathy, and resilience, and to initiate development of essential peer support groups within organizations. In addition, this educational program has the potential to be generalizable to other healthcare professionals not inclusive to CRNAs. The importance of this project is directly related to the need for CRNAs to possess knowledge about the psychological resources to cope with the inexplicable professional stress and moral distress in order to survive perioperative catastrophes and deaths emotionally, physically, and professionally. Outcomes from this translational educational impetus could also be used to help healthcare organizations create supportive environments for their employees and patients.

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DISCLOSURES
The authors have declared they have no financial relationships with any commercial interest related to the content of this activity. The authors did not discuss off-label use within the article.

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