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THE LIVED EXPERIENCE OF SECOND VICTIM CRNAs

A Dissertation

Submitted to Duquesne University

Duquesne University

In partial fulfillment of the requirements for  
the degree of Doctor of Philosophy

By

Michael W. Neft

May, 2022

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2022

THE LIVED EXPERIENCE OF SECOND VICTIM CRNAs

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Approved March 15, 2022

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## ABSTRACT

### THE LIVED EXPERIENCE OF SECOND VICTIM CRNAs

By

Michael W. Neft

May 2022

Dissertation supervised by L. Kathleen Sekula, PhD

A second victim is a health care provider who has been involved in a critical event. A critical event is a clinical situation in which an unforeseen clinical outcome occurs, or the clinical deterioration of the patient takes place for many different reasons. The patient and his/her family are the first victims. The health care provider(s) involved in the event are second victims. After such an event, the healthcare provider may experience a constellation of negative emotions, such as guilt, sadness, depression, somatic symptoms, hypervigilance, and fear. Most second victims require support to cope with the adverse clinical situation. Second victims, their need for support, and methods of assistance are studied in this integrative review. Many of the studies addressed in this integrative review, revealed that having a trusted colleague or staff member with whom to discuss the critical event is therapeutic. Some organizations have developed programs to support second victims in which specially trained staff members are deployed to discuss critical events with those involved, if the participant(s) desire the support. Other

clinical facilities do not have established support programs; however healthcare providers have expressed desire to discuss the event in order to gain perspective, understand why it happened, and sometimes just to ventilate about it.

## ACKNOWLEDGEMENT

I would like to acknowledge the contributions of Nicholas Bircher, MD, FCCM assisting with quantitative data analysis.

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## Chapter 1

This dissertation follows the manuscript option. The first manuscript, an integrative review, is published by the American Association of Nurse Anesthetists Journal and is reproduced here with permission from Chuck Biddle, PhD, CRNA, Editor-in-Chief.

Chapter 4 will include the second manuscript which has been submitted for publication in the *AANA Journal*

## **Manuscript One-In AMA style due to journal requirement**

### **In Press in AANA Journal**

Support Methods for HC Professionals who are Second Victims: An Integrative Review

#### **Introduction: Problem identification and significance**

"Second victims" <sup>1</sup> are healthcare (HC) providers who have been emotionally affected by an adverse patient event. An adverse event of this nature could be an error, an unexpected situation (e.g., massive intraoperative bleeding in a case where this would not normally occur), a health care system-related situation that resulted in patient suffering, a patient safety violation, a near-miss issue, or some other sort of patient-related injury. The HC provider may feel responsible for the event, think that they have failed in their role, or begin to doubt their abilities. <sup>2</sup> The emotional effects that the second victim may experience may vary from anxiety, guilt, sadness, shame/embarrassment, anger, <sup>3</sup> loss of confidence and depression,<sup>4</sup> to a broad range of negative emotional, physical, and psychological results.<sup>5</sup> Second victims' emotions may also be moderated by how much they may identify with the patient and family.<sup>6</sup> Margulies and colleagues<sup>6</sup> studied anesthesiologists and obstetricians (attending physicians and residents), nurses, midwives, nurse practitioners, and medical technicians (n=105) involved in adverse events regarding the impact of the events. The researchers found that the possible reason for the extent of the residents' negative emotions about the adverse event was related to their closeness in age to the patients.<sup>6</sup> Lack of support for a second victim may result in unresolved stress and emotional effects. Some HC professionals experiencing critical events who have been unable to resolve their emotional issues may change jobs. They may experience higher levels of absenteeism,<sup>7</sup> develop poor attitudes toward patients,<sup>8</sup>

experience burnout and post-traumatic stress disorder (PTSD),<sup>8,9</sup> and in extreme cases commit suicide.<sup>4,9</sup> Therefore, it is crucial to support second victims to remain productive, confident professionals.<sup>2, 5, 10-14</sup>

### **Purpose and Specific Aims**

The purpose of this review is to explore, evaluate, and synthesize the methods of support for HC professionals who are second victims. The specific aims are: 1) to determine the support methods available to second victim HC professionals, 2) assess professionals' access to support methods; and 3) determine methods that proved helpful/not helpful to second victims.

### **Methods**

#### **Design**

The design of the review is guided by the methodological approach for integrative review.<sup>15</sup> The methodology consists of five stages: problem identification, the literature search process, data evaluation and analysis, and synthesis of information.

#### **Literature Search**

A health services research librarian aided in the literature search, conducted using PubMed, PsychInfo, and CINAHL. Search terms used included: *nurses, physicians, paramedics, anesthesiologists, emergency medical technicians, advanced practice nurses, medical error, wrong-site surgery, crisis intervention, critical incidents, adverse events, and adverse outcomes*. The Boolean terms AND and OR were used. Inclusion and exclusion criteria were determined as the search evolved. The inclusion criteria included papers published in the English language from 2008-2018 that discussed or studied HC providers who were second victims. Exclusion criteria included articles that were commentaries, editorials, anecdotally based, or un-informative.

## Data Evaluation

A total of 519 papers were identified; 384 were excluded based on the exclusion criteria. One hundred twenty-eight full-text articles were assessed; 92 were excluded because of the exclusion criteria. However, a few anecdotally oriented papers by subject matter experts were included. A total of 43 articles were ultimately included in this integrative review.

Articles were rated on a scale of 0-2 based on content, methodology, and rigor. A *zero*-rating meant that the paper offered no insight into second victims' issues or stress management (e.g., editorials or commentaries). A rating of *one* suggested that the article provided some insight in terms of a case study or anecdotal evidence, but not in terms of scientific inquiry. A rating of *two* indicated the paper offered significant insight into some aspect of second victimology or stress management (e.g., qualitative, quantitative, mixed methods studies, or a case report authored by a known expert in the areas of interest). Examples of this are studies that evaluated methods of support or explained the needs of second victims and studies that made recommendations for second victim program implementation methods.

Papers were primarily from the United States, with several from European countries. Most of the studies met Whittimore and Knafl's criteria for contributing to the body of knowledge of second victimology and support. Their criteria consist of five stages: Problem identification, Literature search, Data evaluation, Data Analysis, and Presentation.<sup>15</sup> The goal in the problem identification stage is to have a clearly defined purpose for the review and its variables; this will help to differentiate between what is important and what is not during data extraction. It is important to carefully assess the

databases used and keywords during the literature search stage, using adjuncts such as ancestry searching to locate pertinent papers that will contribute meaningful works to the integrative review. Inclusion and exclusion criteria must be carefully defined during the literature search phase. In the data evaluation stage, references are evaluated based on research design and methodological quality. Data is coded and summarized as the researcher sees fit, i.e., how s/he can best categorize it so that meaningful information is easy to retrieve. The researcher can then easily discern which studies are best categorized and written about together in the review. During the presentation stage, the information disseminated should “capture the depth and breadth of the topic and contribute to a new understanding of the phenomenon of concern”.<sup>15</sup>

Each study's specific methods of inquiry, sample and setting, intervention(s), tools used, findings, implications, and method of support used by second victims were extracted. Not all studies addressed all areas; for example, not all discussed a specific method of support. The exclusion of one area did not necessarily eliminate the study's value as meaningful information could be gleaned from other areas of the study.

## **Results**

### **Synthesis of Results**

The purpose of the review was to explore, evaluate, and synthesize the methods of support for HC professionals who are second victims. Three themes emerged: 1) *methods of support for second victims*, 2) *accessibility to those methods*, and 3) *the utility of those methods*.

### **Methods of support for second victims**

The methods of support available for second victims who are HC professionals focus on communication. The primary approach is talking to a trusted colleague or friend. In a study by Coughlan et al.<sup>16</sup> some second victims said they were most comfortable speaking with trusted peers about the critical event in which they were involved. They felt that colleagues understood their work-life and could best empathize with what had happened to the patient and what the second victims felt. Those with the same clinical knowledge as the second victim are likely to be effective in helping them to understand "imperfect systems and inevitable human error".<sup>17</sup>

Conversely, second victims may feel uncomfortable talking with peers about the event because they know that there may be an investigation.<sup>16</sup> If they have discussed their role in the incident, they may fear that their remarks may be taken out of context and used against them by the facility leadership, their state licensing board, or the legal system. Some second victims found that talking with a person outside of the work environment was helpful (e.g., spouse, parent). This method is one which second victims may implement on their own.

Han et al.<sup>3</sup> studied surgeons who had experienced an adverse intraoperative event. The surgeons felt that colleagues, not family, and friends constituted a helpful support system. However, the surgeons approach colleagues with caution due to fears of negative peer perceptions. Therefore, they often react to their emotions (e.g., sadness, anxiety, and shame) after an adverse intraoperative event with "repression, self-defense, or depersonalization of the event."

May and Plews-Ogan<sup>18</sup> studied the role of talking to physicians who have experienced a medical error. The role of talking is postulated to help the physician to

develop a description regarding the error. Three themes emerged: silence, talking that did not help, and talking that did help. Silence could be experienced in two ways: the physician who made the error and did not speak about it due to fear and embarrassment, or colleagues and superiors who did not discuss the error with them. As a result, these physicians felt isolated, feeling that no one cared.

White et al.<sup>19</sup> surveyed 5272 risk managers belonging to the American Society for HC Risk Management (ASHRM) regarding their perceptions of available programs to support second victims. Surveys were completed by 635 risk managers. Support providers were connected with second victims via self-referral or the second victims' supervisors or risk managers. Employee Assistance Programs (EAP) were often the only support available to second victims. However, EAP staff were often not trained to help second victims specifically, especially HC staff. Other potential shortcomings of EAPs were the use of non-clinical staff to support second victims who may lack credibility with clinicians, being located off-site, and possibly having restrictive hours of operation. At other facilities, it was the risk manager's job to provide support to the second victims. Participants replied, "don't know" (60%) when responding to the question about the preparedness of the facility to support second victims.

Interestingly, the participants noted that the activities of a second victim support program were considered confidential only when they were provided by the EAP. Some other areas that could be cited in order to maintain confidentiality were the provider-patient relationship and Quality Improvement (QI) activities. Barriers cited for second victim support program success were lack of funding, lack of staff willing to serve as a support person, poor buy-in from executive leadership, and lack of definition about what

best practice is for supporting second victims. Additionally, many clinicians are not always willing or able to access support programs. They often fear that what they say to a support person may be used against them during an incident investigation, or they may not know how to access support systems. The lack of use of second victim support programs may erroneously lead executive leadership to believe that their facility does not have second victims, or perhaps only a few.

### **Types of Second Victim Support Programs**

**Critical Incident Stress Management:** Critical incident stress management involves debriefing allowing the participants to express their thoughts and feelings about the most intense, terrifying aspects of the event. The debriefer acknowledges the intensity of the event and may take the opportunity to educate the participants regarding feelings to expect regarding reactions to the event and possible helping coping strategies. Critical incident stress management is thought to have a positive impact on helpers who have experienced tragic events.<sup>20</sup>

**RISE Program:** Edrees and colleagues<sup>21</sup> conducted a mixed-methods study investigating a specific second victim support program at Johns Hopkins Hospital known as the Resilience in Stressful Events (RISE) program. RISE is often cited in the literature as an example of programs to support second victims. The study spanned four years. The average number of calls to the support program was 1-4 per month. Individual nurses and multidisciplinary groups made the majority of the calls. Calls were made because individuals wanted to call the team or at the behest of a supervisor. Most calls were due to adverse events as opposed to actual errors, such as patient death, difficult decisions, staff assault, intrastaff conflict, burnout, and others. Sometimes a team representative met



with only one person (43%); other times it met with groups (56%). There were few barriers to accessing the support team; most were related to staff being unsure of how to initiate the call. Some challenges to the initial implementation of the program were lack of awareness about what a second victim is, staff concerns about confidentiality regarding seeking help, and risks of potential disciplinary or legal action. Peer responders felt that their initial training and refresher training was essential to maintaining valuable skills.

It emerged during this study that the strength of the RISE program was based on the Johns Hopkins' staff acknowledging that second victims exist and that there were resources to help them. The employees surveyed noted that primarily they wanted to speak with a colleague or peer about the event; after that, they would opt for family, friends, or a supervisor.

**ForYou Program:** The ForYou Team at Missouri University Health Care (MUHC)<sup>4</sup> conducted a root cause analysis of critical events and second victim responses. Interprofessionals and the Employee Assistance Program (EAP) came together to develop a program to support second victims. Staff was surveyed about their needs and concerns. After careful analysis of their findings, the team created the Scott Three-Tiered Interventional Model of Support.<sup>22</sup>

- Tier One: support is provided at the departmental level. Basic training is provided to unit staff about how to recognize potential second victims and how to support them initially. The colleague discusses the event with the potential second victim to determine if s/he may actually become a second victim.

- Tier Two: the potential second victim is displaying signs and symptoms of second victimization. Peer supporters are usually people who work on units at "high-risk" for critical events and have more in-depth training to provide immediate support. If the peer supporter feels it is necessary, s/he can refer the second victim to other resources.
- Tier Three is when the second victim requires counseling and guidance; at this point, the second victim's emotional response is beyond the capabilities of a peer supporter.

**Peer Support Team (PST):** The Peer Support Team of Brigham and Women's Hospital in Boston<sup>23</sup> was established by the Risk Management Department and an anesthesiologist who had been a second victim. This team became part of the Center for Professionalism and Peer Support (CPPS) in 2008.<sup>24</sup> Their vision was to have staff serve as peer-supporters for colleagues who had experienced a critical event. Supporters, colleagues with similar backgrounds who they felt could facilitate conversations about the event and potentially decrease the stigma of seeking help were identified. The program was established outside of the Quality Assurance Program at the facility to decrease fears of lawsuits. However, quality managers from the Employee Assistance Program (EAP) played a role in training the peer supporters, teaching skills that could help supporters listen, assess and support colleagues and recognize when they needed more advanced support. The support team designed to be available around the clock for any staff who needed it was activated, creating a "safe haven"<sup>23</sup> when a critical event occurred with one-on-one or group support sessions available. Confidentiality is maintained whenever the PST is activated; there is no written documentation or record-

keeping. Practitioners, especially physicians, may often not feel comfortable expressing their feelings in front of other professionals; in those cases, one-on-one support is best.<sup>24</sup>

An Australian hospital anesthesiology department developed a second victim support program for anesthesiologists.<sup>25</sup> The goals were to ensure automatic follow-up for anesthesiologists involved in critical incidents, identify staff at risk of immediate and on-going psychological distress, facilitate access to helpful resources, encourage individual staff to seek support as needed, and promote a departmental culture of understanding. The process for this program is that initially, the senior anesthesiologist notifies the support program coordinator that an incident has occurred and which staff members were involved in it. The coordinator then contacts support responders who follow-up within 48 hours with the individuals involved in the incident. Follow-up is also done at one week and one-month post-incident. If more follow-up is required after one month, the person is referred for psychological counseling.

### **Significance of the Support Programs**

Participants represented in studies chosen for this review favored post-critical event support interventions.<sup>3, 7, 11, 18, 19, 26-31</sup> Many were pleased with talking to a friend, usually a colleague who understood their situation. Those who worked at facilities where they could not get help felt that something should be offered. Those who coordinated communication with a friend or other understanding person felt that the workplace should provide some formal system of support.<sup>18, 21, 32</sup>

A study of CRNAs and Student Registered Nurse Anesthetists revealed that more experienced CRNAs may better cope with serious adverse events.<sup>33</sup> A study conducted in the Netherlands<sup>34</sup> surveyed nurses and physicians involved in patient safety incidents. As

adverse patient outcomes increased, so did the nurses' and physicians' symptoms such as hypervigilance, doubts about knowledge and skill, feeling unhappy or dejected, etc. This study supports the quadruple aim as it speaks to improving staff's work-life to optimize HC team performance. The quadruple aim consists of four goals that support one another: better patient outcomes, lower costs, improved patient experience, and improved clinician experience.<sup>35</sup> The researchers felt that institutional support for staff after a patient safety incident was paramount and that support would speak to the quadruple aim by improving the work-life of staff. They postulated that absenteeism and turnover would be positively influenced.

Physicians, Nurse Practitioners, Physicians' Assistants, and residents (n = 901) were studied to determine the impact of errors on HC professionals.<sup>36</sup> Non-physicians experienced more fear of blame and sanction. In terms of support, attending physicians felt less supported than non-attendings (fellows and residents). The support types that study participants felt were important were team debriefings, talking with colleagues, talking with the patient and family, confidential hospital quality review, and departmental case review, to name a few.

### **The Role of Organizational Culture**

The culture of an organization plays an essential role in how critical events are handled and how second victims are supported. A *just* culture is one in which professional discourse is encouraged, to include constructive criticism, i.e., a learning atmosphere exists.<sup>14</sup> Organizations that have just cultures are ones in which the stigma surrounding errors and near misses is balanced by focusing on healing the second victim.<sup>37</sup> Focusing on patient safety as part of a just culture was also identified in a paper

that described a study of Korean physicians, nurses, and pharmacists (n=16) involved in patient safety incidents.<sup>38</sup>

Second victims can feel free to discuss the critical event with colleagues in an atmosphere where they will be safe from ridicule and derision. When Johns Hopkins Hospital developed the RISE program, it decided to adopt a supportive stance toward its providers by establishing a blame-free culture.<sup>39</sup> If a culture of safety exists, i.e., one in which everything is done to assure that all involved (patients and staff) are well-cared for, such a program has a much greater chance of success.<sup>12, 26, 39, 40</sup> Safety cultures facilitate support programs; with staff being more aware of their existence. Conversely, a punitive culture where it is encouraged to "blame, criticize, silence or stigmatize patient safety events creates an environment that instills fear in second victims, making coping difficult".<sup>12</sup> Second victims surveyed in a Belgian study (n=913) communicated that when their organizations' attitudes were characterized by blame,<sup>41</sup> they experienced a higher psychological impact than those from a more supportive culture. However, no data exists regarding the outcomes of any of the programs mentioned in this paper.

### **Accessibility**

Staff is often unaware of a second-victim support program.<sup>10, 21, 26</sup> If unaware they cannot access the programs, people who need help often do not get the needed assistance. Publicizing the existence of a program and de-stigmatizing its use are key to the success of such resources. Most intervention teams have a call system arranged so that a team member is always available and can meet with the second victim(s), usually within 12 hours.

### **Discussion**

Second victims are hospital staff members who have been involved in a critical event, which has happened suddenly and unexpectedly. In the aftermath, the staff who participated in the event are usually shocked, saddened, distressed, and start to experience many of the emotions mentioned earlier in this review. They need to have some way to express their emotions and discuss what has happened. The results of this integrative review noted clearly that second victims want to primarily talk with someone who will actively and empathetically listen to them.<sup>16, 17</sup> Methods of support all revolve around communication, starting with a discussion between the second victim and someone else, progressing to a group debriefing with all involved. Possibly, the post-critical event support could progress to a more in-depth form of therapy.

Participants in the studies used for this integrative review all wanted to talk to someone after the critical event in which they were involved with those not able to avail themselves of such an opportunity being regretful. They felt a strong need to discuss the details of the event. The evidence presented in the studies noted that those who were able to experience some form of support were able to move on with life. Those who were not, moved on with life at a slower pace, or developed or had the potential to develop, on-going psychological problems such as Post-Traumatic Stress Disorder (PTSD), chronic depression, or suicidality.<sup>4, 9</sup> Support after a critical event is something that should become integral to the management of HC organizations. In a study of CRNAs (n=196), 87.4% of participants believed that after an adverse event, peer support and debriefing with an anesthesia professional would be helpful in the future, and 67.2% felt that it should be standard operating procedure.<sup>33</sup> If staff are offered help to deal with the negative feelings generated by a critical event, they are likely to remain on-the-job as

productive members of their profession. In an effort to support this, second victim assistance programs should be both generalized, individualized, and sustainable.<sup>33</sup>

Accessibility to support resources is an issue for second victims.<sup>21, 42</sup> Some facilities offer no formal support program, causing victims to deal with their issues independently. Coping mechanisms used may be maladaptive. Second victims may develop substance use disorders, be excessively absent from work, or become withdrawn, all negative methods of coping.

In other facilities, post-event support is available for second victims; however, the programs are not well-publicized, and either employees do not know they exist, or they do not know how to access them. Senior leadership in HC facilities must take an active part in the development, sustainment, and overall support of these programs. If they do, evidence exists that the programs will be better known within the organization and better used.<sup>39, 43</sup> Often, it is necessary to market these programs to the staff so that they understand that senior leadership supports them and that there will be no punitive action taken based on what information may emerge during any debriefings to utilize the service.<sup>44</sup>

### **Implications for Practice, Policy, and Research**

When second victims consider the critical events in which they were involved, they often develop overwhelming emotional issues. Some of these issues, such as doubting their knowledge and abilities, guilt, and depression, render second victims unable to continue in their current job, or sometimes even in their careers. An implication for practice is that if second victims are supported through these emotional matters post-critical event, they may be saved from career alterations that they may regret. Supporting

the second victim may also help the profession in that they, as experienced professionals, are not lost to their institution or profession. Another practice implication is the learning from critical events that can happen when examined carefully in safety culture. If a critical event occurs in a facility with a safety culture versus a punitive one, the critical event can be examined for all contributing issues. In this way, those issues can be rectified, and the facility staff can alter practice or routines that contributed to the critical event so that a similar one does not happen again.<sup>2, 11, 40</sup>

Policy change can be born of the careful examination of a critical event. Often, critical events are the result or partial result of a poorly conceived institutional policy or procedure that results in patient harm or near-harm. As the critical event is studied, to include an interview of second victims and deficits are identified, policy and procedure can be altered so that patient care is affected positively. Therefore, patients and staff both benefit from the policy change. Patients gain by receiving more meticulous care. Staff benefit by having better policies and procedures to follow that affect that care, and as a result, there are fewer second victim issues in the future. The policy also needs to be in place regarding how second victims are to be supported within an institution. Often second victims do not know where to turn for help, and co-workers (and often superiors) do not know how to help them access help. Without a policy in place that defines the support process for second victims, their feelings of abandonment and isolation may be unresolved.<sup>14, 22, 29</sup>

### **Limitations**

There are some limitations to this integrative review. One is that it is difficult to discern what methods of support are best for which professional group. For example,



many of the studies reviewed looked at "nurses, physicians, and other health professionals." They did not look at the three groups separately; often, the "other health professionals" comprised different groups, with only one or two participants in each profession. In many cases, these studies also did not differentiate between nursing and physician subspecialty groups.

A ten-year span was the time limit for the papers studied. Discussion about support for second victims has been in place in some form, albeit unorganized, for decades. It would be informative to look back at the literature written in past decades from a historical perspective. A ten-year range was set for the studies used in this review; the number of papers it produced was more manageable than a wider time span.

The terms used to define the subject of interest during the literature search phase may have been too vague, inviting the return of numerous papers that were difficult to sort through. Consequently, some promising material may have been missed; this was managed by careful review of paper titles and abstracts.

### **Conclusions**

Second victims are valuable professionals who have been involved in a critical event. In clinical care, unforeseen circumstances arise, emergencies occur, and events happen that were not intended. Patients and their families suffer due to these events (they are the first victims). Staff suffer due to feelings of guilt, depression, and doubt of their knowledge/skills after the event. If they are not helped to deal with these feelings that result from the stress of being involved in a critical event, they may feel they have no alternative other than to change jobs, leave their profession, and in some extreme cases, commit suicide. Staff can learn from the experiences of second victim colleagues.

This integrative review found that second victims are usually eager to receive help. They feel bad about the critical event in which they were involved and need to sort through their feelings about it. They want to talk with someone, usually a trusted colleague or friend, who will actively and empathetically listen to their view of the critical event. Often this is all the support a second victim needs. However, organizations should have a policy and procedure in place for how to help second victims who require more help. It is most effective if this policy and procedure take the form of a formal program, fully supported by facility leadership. The types of support available and how to access them should be clearly defined. The program should be marketed to all who work in the facility so that they are aware of it and know how to get help if they become a second victim. The facility's culture plays an integral part in the success or failure of policies and programs designed to help second victims. If organizations have a safety culture, then the programs and policies may be successful because the staff is encouraged to discuss events openly and honestly to learn from them. If organizations have a punitive culture, then staff try to hide anything that may be perceived as negative and not discuss events. Consequently, critical events are not used as learning tools, and staff do not grow from them. If staff can learn from critical events, there is less chance of them being repeated. Therefore, ultimately, patients in a facility with a safety culture benefit from the opportunity staff have to learn from critical events.

This review led to the decision to study CRNAs as second victims, a population not addressed in the literature. The goal of this review is to give voice to CRNA second victims so that their stories can be heard, and their peers and superiors can begin to determine how best to help them.

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## Chapter 2

The approved dissertation proposal is presented here. The proposal was successfully defended on January 21, 2020. All comments gathered from the defense were incorporated into the document below. It is in APA Style as required by the Duquesne University School of Nursing.

Dissertation Proposal: The Lived Experience of Certified Registered Nurse Anesthetists

as Second Victims

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## Dissertation Proposal: CRNAs as Second Victims

### Introduction

This mixed methods study focused on the lived experience of the Certified Registered Nurse Anesthetist (CRNA) second victim. Interviews explored the types of critical events CRNAs were involved in, their feelings about them, and stress levels at the time of the event and at the present time, as well as the support that the CRNA(s) received post event. In short, this study attempted to elicit the essence of the lived experience of second victim CRNAs.

A critical event is an untoward, patient-centered experience that often happens suddenly and unexpectedly. Some examples are death, hemorrhage, violent behavior in a patient or family member, and other unexpected, emergent crises. The *first victim* in a critical incident is the patient and his/her family. In circumstances such as this, both the first victim(s) and the second victim must be cared for. A health care worker involved in a critical professional incident may become a *second victim* (Wu, 2000, p. 726).

The health care worker's perception of the event influences whether or not he/she experiences that event as a second victim. Little is known about the experience of Certified Registered Nurse Anesthetists (CRNAs) when they become *second victims* after having experienced a critical incident. Research suggests that other healthcare workers such as doctors, nurses, pharmacists, social workers, and trainees, who are second victims may experience such severe internal turmoil that they leave their profession (Scott & McCoig, 2016). When they are involved in a critical event, the potential exists for significant emotional toll. They may feel responsible for the event, and experience anxiety, guilt, sadness, shame, embarrassment, and anger (Han et al., 2017).

Participants in a study dealing with second victim support expressed that different forms of communication would be important to them in working through their feelings in the aftermath of a critical event (Edrees et al., 2011). Debriefing, discussion of ethical concerns, contributing to methods to prevent similar incidents from occurring, information about the investigative process and how they can access emotional support, if needed were deemed important by the participants.

In many facilities, when critical events happen, healthcare professionals are advised to downplay the incident (Van Gerven et al., 2016). In this type of organizational culture where critical events are not addressed openly, staff are often fearful, patient safety events are used to blame and criticize, therefore staff do not discuss them, resulting in poor coping as a result (Quillivan et al., 2016). A patient safety event differs from a strictly clinical event where an unexpected disease complication or trauma occurs resulting in a situation that staff find difficult to work through from an emotional perspective. Staff can emerge as second victims from both types of situations. An example of a clinical event might be a multiple trauma case that presents to a small community hospital emergency room; the staff in such a facility are not accustomed to or equipped to care for patients this sick, however they have no choice but to do so here. The aftermath of caring for such a patient may leave staff with emotions that they find hard to face. People need to be supported after a critical incident, which may take various forms; one of which being debriefing (Coughlan et al., 2017; Edrees & Wu, 2017) so they can determine why the incident happened and how similar incidents can be avoided in the future (de Boer, et al., 2014; Edrees & Wu, 2017).



Although we have knowledge regarding other healthcare professionals related to becoming a second victim such as nurses, physicians, social workers, and coroners (de Boer et al., 2014; Flannery & Greenhalgh, 2018; Krzan et al., 2015; Mangurian et al., 2009; May & Plews-Ogan, 2012; Quillivan et al., 2016). We do not have the same robust studies concerning CRNAs.

### **Health Care Issues Related to CRNAs as Second Victims**

This proposed study will address the experiences of second victim CRNAs. This is the gap in the literature. No research exists regarding the lived experience of CRNAs during a critical incident/event, the support they receive if any, and short and long-term effects. My long-term goal is to disseminate the findings of this study and serve as an advocate for CRNA second victim support.

The importance of exploring the experience of CRNAs is two-fold. First, patient care may be compromised if CRNA second victims are not supported after critical events. The compromise in care would come from CRNAs possibly losing confidence in their ability to do their jobs and possibly performing at a lower level, or leaving the profession. The demand for CRNAs is high, the cost of recruiting and orienting new CRNAs is also high: \$21,000.00 (personal conversation A. Orsino, Chief Nurse Anesthetist, UPMC-10/2019). If CRNA second victims are supported after a critical event, they may remain an active contributing member of the profession, remaining at their place of work, decreasing the need to expend resources on recruitment and retention. Second, problem solving and quality improvement in patient care can only occur when incidents are addressed openly (Coughlan et al., 2017; Edrees et al., 2011). When second victims are supported, they can help to assess why the critical event happened and determine what

can be done to prevent future occurrences. They can study the root cause of the problem, examine system issues that may have contributed to it, scrutinize training and staff development practices that may need to be improved upon and make recommendations accordingly. If they are not supported after a critical event, they may be too consumed by negative emotions about the event to actively contribute to solutions for the problem.

Second victims need to be supported post event, so that they can effectively explore and overcome negative feelings. Support may take the form of discussion and perhaps counseling related to the event. This is important so that second victims can review the event objectively, help to determine what could have been done to prevent it or mitigate its effects, and continue to perceive themselves as an effective professional. The qualitative strand in this mixed methods study will explore the lived experience of the CRNA involved in the critical incident. In the quantitative strand attempts will be made to determine stress levels at the time of the event as well as currently. Perhaps this study will result in understanding what interventions can be put in place to help this particular group of clinicians.

## **Background**

**Critical Event** - A critical event is an unforeseen incident affecting a patient in some negative way. It could be an error, something untoward such as an unfortunate judgement call, or perhaps a systems problems that resulted in some form of negative outcome (Coughlan et al., 2017; Edrees et al., 2011; Han et al., 2017; Kable et al., 2018; Robertson & Long, 2018). Some specific examples are mistakes in the operating room which cause a death, medication errors, not calling for help when a patient is deteriorating thus contributing to a poor outcome; and having to care for a gravely ill

patient when one does not have the skill set (e.g. a small hospital that usually does not have trauma patients having a trauma patient admitted who is extremely compromised). The CRNAs may not have made the actual decisions involved in the event, but may have been part of the team involved in the critical event.

**Second Victim Phenomenon.** The definition of a second victim was refined by Wu (2000) who initially coined the term. Scott et al. (2010) went on to describe second victims as healthcare providers involved in an unfortunate event as outlined above, adding that they become victimized because the event they were involved in was traumatic for them, leaving them feeling responsible for the patient outcome(s), and doubting their clinical skills/judgment.

Signs and symptoms that a second victim may experience tend to be emotional in nature coupled with professional concerns. Some examples are: anxiety, guilt, sadness, shame/embarrassment, anger (Han et al., 2017), loss of confidence, and depression (Scott & McCoig, 2016), fear, shame, frustration, anger (Mira et al., 2017), sleeplessness, difficulty concentrating, fear of lawsuit, loss of reputation, burnout, decreased quality of life, self-blame (Robertson & Long, 2018), lack of support, trauma, stress, over-reaction, exhaustion, helplessness, isolation, devastation, vulnerability, flashbacks,/memories, panic, disbelief and fear of blame (Kable et al., 2018).

Support after a critical event is key to second victims being able to feel positive about their work and to have a good quality of life (Delacroix, 2017; Dukhanin et al., 2018). Those who do not receive support have to deal with the negative emotions that are a result of a critical event alone (Edrees et al., 2011). These professionals have the potential to develop life-long sequelae of the negative emotions, such as post-traumatic

stress disorder (PTSD), chronic depression, or even suicidality (Blacklock, 2012; Scott & McCoig, 2016). Communication appears to be key to offering support (Coughlan et al., 2017; Edrees et al., 2011).

### **Examples of Interventions and Methods to Support Second Victims in Healthcare**

While we have research that identifies some interventions that have been successful in other professions we do not know what types of interventions that work (i.e., best practices) within the culture of the CRNA profession. Are their needs different from others or might they be the same? The following are some examples of methods/interventions that have helped other healthcare workers who were second victims. Communication is key to methods/interventions to support for second victims. Being able to talk to someone, often someone with the same clinical background may be sought out by the second victim, who listens empathetically and without judgment is important. (Edrees et al., 2011). However sometimes second victims may not want to talk with peers because they may fear that comments they make may be used against them in an investigation of the event (Coughlan et al., 2017). Two major examples of communication-oriented support methods are the Resilience in Stressful Events (RISE) Program at Johns Hopkins Hospital (Edrees et al., 2016) and the ForYou Program at the University of Missouri Medical System (Scott et al., 2010).

#### **Resilience in Stressful Events (RISE) Program**

The RISE Team at Johns Hopkins Hospital (Edrees et al., 2016) is composed of members of several disciplines, who are volunteers. There is always a team member (“peer responder”) on call who can be paged by concerned staff. Team members respond within 30 minutes when paged; they may or may not be a member of the same

professional groups as those involved in the critical event. They meet with the second victim(s) within 12 hours and listen to them explain what happened in an empathetic, non-judgmental manner; these interactions are confidential. The team members supply the second victims with resources based on their assessment of the victim's needs and what they may have requested.

In discussion with Anna Koerbel, Business Development Manager for the Maryland Patient Safety Center of the Mid-Atlantic Patient Safety Organization (Personal Communication, November, 2019) she stated that when peer supporters talk with second victims, case details regarding name of the patient, location, names of other team members involved in the patient's care are specifically not discussed. Notes are not taken by the peer supporters during discussions with second victims. Therefore, if they were to be called as a witness in a legal action, (which Ms. Koerbel stressed has never happened in the history of the RISE Program) they would know little to add to any investigation. If for some reason, the supporter felt it prudent to take notes, those written documents can be protected and therefore be free of being called in any litigation.

### **ForYou Program**

The ForYou Program at the University of Missouri Health System (Scott et al., 2010) consists of three tiers. In the first tier, support is provided by peers at the unit level. These staff members have been trained to recognize second victims and support them initially, immediately post event. In the second tier, second victims who are displaying signs and symptoms such as guilt, depression, and fear are identified. When the unit-based staff discern this, they call peer supporters from high-risk areas such as critical care units, pediatrics or the emergency room who can provide more in-depth support. Tier

three is reached when the second victim needs further counseling and guidance. The needs of the second victim are beyond the capabilities of peer responders at this point. Therefore, staff such as psychologists, chaplains, employee assistance personnel, and social workers will be mobilized to render assistance to the second victim.

The RISE and the ForYou programs are both examples of methods/interventions that have worked in two healthcare facilities. They are good examples of how second victim support programs can be structured and may contribute to developing programs for CRNA second victims.

### **Folkman and Lazarus Stress and Coping Theory**

The theoretical framework that will guide this study is Folkman and Lazarus' Stress and Coping Theory. This theory states that stress is a relationship between the person and the environment (Folkman et al. 1986). Thus, this study will assess and examine aspects of the person in relationship to their environment, i.e. the clinical environment. The environment and the person interact to produce feelings (Folkman et al., 1986). Lazarus (1998) discusses stress and coping from a transactional viewpoint. The person perceives the environment as stressful and threatening to them in some way (Lazarus, 1991). This perception is the result of appraisals of his/her environmental appraisal. Primary cognitive appraisal is when they determine that the situation is a threat of some sort to them, i.e. this is where there is a transaction between the environment and person, where stress is experienced. Secondary cognitive appraisal is where they decide what they are going to do about the threat; this is coping (Lazarus, 1997).

### **Application of the Theory to CRNAs as Second Victims**

When CRNAs are involved in a critical event, their involvement with the event is their intersection with the environment. If they appraise the event to be bad in some way, e.g. a patient's treatment is incorrect, a patient is rapidly deteriorating, or maybe they are in a situation in which they do not know how to function, the primary appraisal, will produce stress for them. Upon secondary appraisal they have to decide, what to do to cope with that stress; i.e. they ask themselves what resources can they draw upon (Lazarus, 1997). They will try to improve the situation by changing their behavior or trying to alter the environment in some way. Managing stress-related emotions are also a challenge. A key method of coping to be vigilant of is palliative coping (Lazarus, 1997). When people employ this method of coping, they have acknowledged that there is a problem, but they do not want to take corrective action, so the method of coping is to do nothing. An example of this might be a CRNA noting blood loss during surgery, but not wanting to acknowledge the amount of loss because this particular surgeon gets angry when blood loss is pointed out to him/her, so the CRNA does nothing in order to avoid a tirade from the surgeon.

## **Innovation**

### **A Voice for Second Victim CRNAs**

This project is innovative for several reasons. The study gives voice to second victim CRNAs, a group that does not have a voice in the critical event literature. Other health care professionals are represented in the literature as second victims (Chan et al., 2018; Delacroix, 2017; Han et al., 2017). This project, a mixed methods study, will provide an opportunity to discuss CRNAs' thoughts and feelings, via interview, about a critical event in which they were involved, the support they received afterward, and its

utility. As noted above, in the discussion of the literature, most second victims want to talk about the critical event (Coughlan et al., 2017; Edrees et al., 2011). This study is also clinically relevant in that helpful methods of support for second victim CRNAs may emerge.

The study will also examine the support CRNAs received post critical event. It is important that support methods be studied so that CRNA in leadership positions in health care facilities can make good decisions about how to best support their staff after a critical event. If evidence-based support is provided to CRNAs after a critical event, CRNAs may be able to better manage the emotional aftermath of a critical event. Best practices may emerge regarding the support process of CRNAs who are second victims. This would help to stabilize and support the CRNA workforce because when CRNA second victims are supported after a critical event, they may be less likely to leave the profession. While there are no findings in the literature pertaining to CRNAs and critical events, Scott and colleagues discuss six stages of recovery in the second victim phenomena: Chaos and accident response, Intrusive reflections, Restoring personal integrity, Enduring the inquisition, Obtaining emotional first aid, and Moving on-dropping out, surviving or thriving.

The sixth phenomenon is “moving on” (Scott et al., 2009, p. 329; Scott & McCoig, 2016) in which the second victim may choose one of three paths. One of the paths is that they may survive (i.e. continue to come to work, do their job, but still feel haunted by the event). Another path is thriving, in this case they are able to contribute to processes to help avoid another incident such as the one in which they were involved; in this circumstance the second victim feels that they are helping to make things better for



patients and staff. The final option is to drop out; in this case the person leaves their current job to move to a different location, change their role, or leave the profession entirely.

Burlison and colleagues studied the effects of the second victim phenomenon on work-related outcomes, specifically turnover intentions and absenteeism (Burlison et al., 2016). They found that if second victims perceived low organizational support for their situation, they were more likely to be absent from work or leave.

Current clinical practice in most settings, after a critical event, is for CRNAs to go back to work after the event, with no time for debriefing, or discussion of the event. The event is usually only discussed with risk managers, or other hospital appointed investigators such as supervisors, service chiefs, and others (Chan et al., 2018; Delacroix, 2017). Giving CRNAs a chance to discuss critical events that affected them is important. It is significant that this occur for the clinician second victims as they try to process the issues that caused the critical event, and what may emerge from the interventions (Coughlan et al., 2017). This post critical event discussion should ideally be conducted with an empathetic listener, whether a personal friend, or through a formalized program such as RISE (Edrees et al., 2016) or ForYou (Scott et al., 2010).

While there is no research yet to determine outcomes of these programs, in settings where these methods have been operationalized there appears to be positive feedback regarding their impact. Perhaps these programs could be effective for CRNAs who are second victims. Through discussion, quality improvement interventions may emerge, the use of which might assure that similar events do not occur and will result in retention of expert anesthesia providers.

## **Method**

### **Specific Aims**

1. Identify the level of stress experienced by the CRNA at the time of a critical event and at the time of the study, as measured by the Post-Traumatic Stress Checklist-5 (PCL-5),
2. Document the lived experience of a CRNA who becomes a second victim after being involved in a critical incident.

### **Research Design**

The chosen methodology for this project is the convergent mixed methods design. A mixed methods design was selected in order to provide more in-depth information than in a quantitative or qualitative study alone. The mixed methods design allows for a more complete (i.e. comprehensive) evaluation of the problem (Greene, 1989). The qualitative data will be analyzed first, followed by analysis of the quantitative data so that the results of the quantitative strand do not influence the results of the qualitative strand. The two strands will then be analyzed and interpreted for a full view of what a nurse anesthetist experiences when s/he is involved in a critical event. How one method informs the other will be a major focus of the final analysis.

### **Quantitative Strand**

Specific aim 1 will be addressed in the quantitative strand which will include a survey, the Post-Traumatic Stress Checklist-5 (PCL-5), developed by the Veterans' Administration. This survey will measure stress levels of anesthetists at specific times (at the time the critical event occurred and then at the time they are involved in the study). If they have experienced an event like this and see themselves as second victims, they will

be asked to consider completing the survey. If they have been involved in more than one critical event in their careers, they will be asked to isolate their responses to one particular event that they consider to be the most troubling.

**Procedure: Quantitative Strand.** The PTSD Checklist-5 (PCL-5) will be distributed to the AANA membership through the AANA Foundation, the research arm of the AANA. Approximately 86% of CRNAs in the United States belong to the AANA. The AANA Foundation will distribute surveys via electronic communication to up to 3000 of its members for a fee of \$1,200. The letter to be distributed with the survey is in Appendix A. The members will be selected at random per guidance from the researcher. There are no restrictions regarding which members will be included in the mailing. Documents that are required by the AANA are: Endorsement letter from research advisor, copy of Institutional Review Board (IRB) approval, abstract of 200 words or less, and a copy of the survey.

Participants will be asked to complete two versions of the tool, A and B. The A version would speak to how they felt at the time of the event and the B version would speak to how they feel now and will note the time since the incident happened.

### **Quantitative Instruments**

The variables that the quantitative strand will measure are stress symptoms after a critical event and the support received post event. The instrument used to do this will be the PCL-5 (Appendices C1 and C2) with five open-ended questions added at the end of the survey version A. These questions will ask about what type of event the CRNA was involved in, the support s/he received, and any other comments they want to include. The Post-Traumatic Stress Disorder (PTSD) Checklist-5 (PCL-5) was developed by the

Veterans' Administration (Bovin et al., 2015) and is meant to measure symptoms over time. It is not a diagnostic tool but is best for measuring ongoing symptomatology. The PTSD Checklist (PCL) was originally developed in 1990 as a method of assessing PTSD symptoms. It was developed by the staff of the Veteran's Administration (VA) Center for PTSD. Its first iterations were composed of 17 items which met the PTSD symptom criteria of the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV). The areas assessed were rated on a 5-point Likert scale by informants. The scale ranged from 1= not at all, to 5 = extremely (Blevins et al., 2015).

The revised PCL-5 is a 20-item, self-report tool that assesses for the 20 symptoms of PTSD noted in the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5). It can be used for three different aspects of patient care: monitoring symptom change, PTSD screening, and provisional PTSD diagnosis (Bovin et al., 2015; Veterans Affairs, 2017). The 20 items on the PCL-5 are scored on a Likert scale of 0-4; the total possible score is 0-80. One has to determine a cut score for the population being studied based on the goals of the assessment. For this study the tool will be used only for monitoring symptoms, therefore a cut score does not need to be determined.

Overall, the PCL-5 was found to have very sound psychometric properties though in one particular study it was felt to be most useful in a clinical setting, treating active duty service members (Wortmann et al., 2016). Other studies demonstrated good convergent and discriminant validity, test-retest reliability, and internal consistency (Blevins et al., 2015; Bovin et al., 2015).

### **Power Analysis**

The proposed mixed methods study will explore the experience of second victim CRNAs. The quantitative strand of the study will explore the stress levels (measured by stress level screening) of second victims at the time of the event and at specific time points after the event. A thorough review of the literature revealed that no research has been conducted that measures the anxiety level of second victim CRNAs at the two time points. The only research that was identified related to programs that support second victims was focused on the use of the support programs by clinicians. These studies reported on the acceptance and use of a second victim support program in two facilities. The main areas examined in these studies was staff knowledge about the program and its use. This proposed study will differ from the studies mentioned because it will study the second victims' perceived stress levels at two different points in time; at the time of the critical event and at the time of participation in the study. A study of this type has never been done.

The effect size for this study (Cohen's D) is 0.3, or medium. The reason for this is because there may be great variability in the time span between when the CRNAs became a second victims and the time of the surveys. The statistical test that will be used is a two-tailed dependent sample t-test because there is no previous research that identifies the direction of the stress level in a similar population. G\*Power software was used to calculate the sample size for a two-tailed test with an effect size of 0.3, an alpha of 0.05, and a power of 0.90. The number of participants required would be 119.

### **Qualitative Strand**

Specific aim 2 will be addressed in the qualitative strand. The goal of the qualitative strand is to elicit the lived experience of a CRNP who has experienced a

critical event and become a second victim. A subset of the participants in the quantitative strand who agree to participate in an interview to explore the lived experience of having been involved in a critical event will comprise the population for the qualitative strand. The qualitative strand will follow the tenets of Hermeneutic Phenomenology, utilizing open-ended questions in order to give voice to the participants to elicit the lived experience of second victims.(Ho et al., 2017).

**Procedure: Qualitative Strand.**

The qualitative strand will utilize a semi-structured interview guide composed of open-ended questions which would attempt to elicit participant’s specific feelings about the event. If they have been involved in more than one critical event during their careers, the researcher will ask them to focus on only one. The reason for having them choose which event they wish to focus on is because it is most likely that they will choose the event that is the most meaningful to them.

The researcher will pose probing, non-leading questions as needed to elicit richer information (See Appendix D for proposed semi-structured interview questions). The goal of hermeneutic phenomenology is to “describe the meaning of a phenomenon and understand the contextual forces that shape it” (Bynum & Varpio, 2017, p. 1). In order to truly understand the lived experience of another we must use language as a tool: not only language as we know it, but language as the people who we want to learn about use it. We have to “dwell” in their language with them, setting aside any preconceptions we may have in order to truly hear and understand what they are saying. Listening to what they say, how they say it, and analyzing what they say for patterns of thought, feeling, emotion, and experience are crucial to understanding them. Interviews with participants

are conducted until data saturation is reached, i.e. the same themes (nothing new) emerge during analysis (van Manen et al., 2016).

### **Setting**

**Quantitative:** The quantitative surveys will be completed by participants on-line.

**Qualitative:** Interviews for the qualitative strand will be conducted in person if the participants live close to the researcher. Otherwise the interviews will be conducted via a platform such as ZOOM. The timing of the interviews will be mutually agreed upon, allowing for work schedule considerations, personal obligations, time zone differences, and any other issues that may arise. The goal is to make the experience as easy as possible for the participants. Interviewees will be added to the qualitative interviews until saturation is reached. Those who are not needed for further analysis will be contacted and thanked for their willingness to participate.

### **Sample Population**

The population studied will be Certified Registered Nurse Anesthetists (CRNAs) who are members of the American Association of Nurse Anesthetists (AANA). Those who participate will have experienced a critical event at some point during their career. Nurses will be accessed through the AANA. Inclusion criteria are CRNAs who perceive themselves to be a second victim. There are no exclusion criteria. Participants in the quantitative survey will be invited to participate in an individual interview to discuss their experience. They will be asked to include their contact information at the bottom of the demographic form if they wish to participate in the qualitative interview.

### **Plans for Data Analysis**

#### **Quantitative**

Data from the PCL-5 will be entered into SPSS™ (version 27). Data entry accuracy will be checked by a research assistant. The data will be cleaned by analyzing its descriptive statistics and its distribution to identify outliers. Outliers will be identified in the data set and determination will be made whether the outlier should be kept or should be eliminated from the analysis. Two measures of central tendency, the median and mode, will be examined to determine which responses occurred most frequently and which responses are the mid-values of the data collected. Data will be coded using the 0-4 scale from the PCL-5. If any data is missing (i.e. a participant did not answer one of the 20 PCL-5 items) the item will be coded with an “X” for that participant in order to easily identify missing data and to identify patterns of missing data. Likert scale data is ordinal, therefore an Analysis of Variance (ANOVA) will be conducted, possibly including the Mann-Whitney or Kruskal-Wallis tests. A significant p value for this study will be set at .001, and alpha level will be  $< .05$ .

The five open-ended questions added to the quantitative survey will be initially analyzed for common themes; counting the frequency at which they occur. The short answer questions added to the end of the A version of the PCL-5 will be analyzed and added to the quantitative data analysis.

### **Qualitative**

The researcher will review each interview word-for-word, and send a copy of the transcription to the individual participants for their review. If needed or desired by the participants, the researcher will interview them a second time to clarify any issues that emerged during the first interview. The transcribed interviews will be analyzed for



common themes by the researcher. NVivo™ version 12 will be used for data management.

Ricoeur used his theory of qualitative data interpretation to develop a 3-phase process for use in hermeneutic phenomenologic data interpretation (Tan et al., 2009). The researcher will use this method to analyze qualitative data. The first phase, “explanation”, uses the interview transcripts and the researcher’s journal notes. They are both analyzed with each being coded to “free nodes” (Tan et al., 2009, p. 10); emerging ideas. At this beginning point, words are accepted as spoken or written; there is no attempt at interpretation. Before moving to the next phase, documents must be re-read to assure that nothing the participant has expressed is missed.

In phase two of Ricoeur’s process, “Naïve understanding”, the free nodes from phase one are studied for the same or closely related ideas. The ones with the same ideas are grouped into main themes. Each theme is given a name that describes the main idea of the data coded to it. The ideas under each theme are examined and subthemes are created as needed. Each subtheme is studied to determine how the free nodes coded to it could be grouped into categories, with each category being devoted to some part of the subtheme. Each category is assigned a descriptive name. “The naïve level of understanding achieved in level 2 analysis is still to a large extent based on the internal nature of the text but does include making decisions about similar or near identical meaning of particular words and phrases” (Tan et al., 2009, p. 11).

In phase 3 of Ricoeur’s process, “In-depth understanding”, this involves what Ricoeur calls the “hermeneutic arc” (Tan et al., 2009, p. 11). The arc is the researcher moving back and forth between explanation and understanding. “The acts of

interpretation that are a part of this process are informed by areas of knowledge” (Tan et al., 2009, p. 11). Interpretation starts with the researcher acknowledging his/her own experience and beliefs, i.e. what s/he bring to the project in terms of these areas. The next area is the researcher’s knowledge and experience about the study participant. A goal here is recognizing of how the parts brought forth in the coding; theme, subtheme and category development relate to the whole (Geanellos, 2000), i.e. the participant’s lived experience.

The qualitative data will be derived from the interviews and analyzed as they are completed in order to strengthen future interviews to delve more fully into the phenomena, or to go back to an interviewee to clarify certain questions. Interviews of participants in the local area of Pittsburgh, Pennsylvania will be audio-recorded by the researcher and transcribed by a transcription service. Each interviewee will be identified only as a number. Once the interview is complete and the audio transcribed, no identifiers will be left on any data. Interview recordings of participants not in the local area of Pittsburgh, Pennsylvania will be recorded via ZOOM™ technology. The researcher will save the transcription of the interview with only a number identifier and delete the ZOOM™ recording after the interview in order to protect the anonymity of the participants. Notes will be kept during each interview in order to record expressions of emotion, changes in vocal intonation, and if communication techniques such as pausing at certain intervals or during certain parts of the discussion are used. Notes will be reviewed after each interview, in order to assure clarity. After the transcriptions of the interviews have been reviewed by the participant and the researcher for clarity and precision, they will be uploaded in the NVivo™ version 12 system, for data management.

The researcher will conduct thematic analysis on the data. Interviews will continue until data saturation is reached, i.e. the same common themes emerge from multiple interviews.

### **Potential Study Limitations**

Willingness to share details is the biggest potential limitation. For example, asking people to recall details about an event that may have happened long ago may be problematic. Their memories may not be as acute for details of the event as they were closer to the event. They may experience a bias of sorts when recalling events, i.e. remember only the more favorable parts of an event. Participants may not be willing to share all of the details of the event or issues that lead to it, or arose after it during the qualitative strand of the study. To address this, the researcher will reassure participants that what they say will be held in confidence and that they are encouraged to say whatever they wish, realizing participants have the ultimate control in what they say, and the researcher may not learn all of the details that he might want to.

The main challenge to the quantitative strand of the study, will be CRNAs not wanting to complete the surveys for several reasons. Bad memories may be stimulated by the project, they may want to forget about what happened in the past, and they may not see the value in discussing an event from the past that they perceive as being “bad”.

The qualitative strand may pose special challenges in the area of determining themes, subthemes, and categories and interpreting them. If themes do not emerge distinctly in the interviews they may not be readily noted and analyzed; therefore, important information could be missed. Also, interviews recorded on ZOOM with audio recordings will be analyzed while viewing both the video of the recording. Technical

problems can occur with interview recordings not uploading correctly and being lost, or the NVivo™ software may not work correctly effecting thematic analysis.

Recruiting participants will be conducted via email from the AANA Foundation. It will contain a cover letter explaining the study from the researcher and the surveys. Many potential participants may ignore the email and delete it. Others may only complete one version of the survey which will skew my data, or render their input as unusable. Regarding the qualitative strand, people may send their contact information to participate in the quantitative strand, and then not follow through with interview scheduling. Another possibility is that they may only allow one interview and the researcher may not be able to seek clarity on some issues they may have raised by doing a second interview. Or, a worse-case scenario, no one may want to participate in the qualitative strand due to the memories of the critical events being too painful.

**Appendix A: Proposed letter to potential participants to accompany surveys**  
**distributed by the AANA Foundation**

Dear Potential Participant:

Thank you for considering participation in my dissertation study, *The Lived Experience of Certified Registered Nurse Anesthetists as Second Victims*. This study is being conducted by the Primary Investigator, Michael W. Neft, DNP, MHA, CRNA, FNAP, FAAN (the undersigned) as part of his PhD dissertation. This study is funded by \_\_\_\_\_. A second victim is a practitioner who has experienced a critical professional event. The first victim is the patient and family. The second victim is the practitioner(s) involved. A critical event is an unforeseen incident affecting a patient in some negative way. It could be an error, something untoward such as an unfortunate judgement call, or perhaps a systems problems that resulted in some form of bad outcome; you may not have made the actual decisions involved in the event, but may have been part of the team. If you think you have ever experienced an event like this, since graduation from anesthesia school, and see yourself as a second victim, please consider completing the attached survey. If you have been involved in more than one critical event in your career, please isolate your responses to one particular event that you consider to be especially troubling. Please complete it with two-time frames in mind. The first-time frame would be when the actual event occurred. This research is being conducted to determine your perceived level of stress at the time of the event. The second time frame is now, the time at which you are completing the survey; I would like to get a sense of what your stress level is like now, in reference to that event. Your privacy will be protected because the surveys will be coded with a number and the letter A or B, your name will not be used anywhere on them. The A version of the survey should be completed as you reflect on how you felt at the time the event occurred. Version B of the survey should be completed with how you feel now regarding the event. These types of experiences may be difficult to share. However, your open and honest feedback will improve our understanding of the impact of critical events on nurse anesthetists, which will inform the development of much needed supportive interventions after these events. The surveys should take no more than 20 minutes to complete. Your time is greatly appreciated. Please note that the survey format is designed for use with a regular computer screen (either laptop or desktop). Not all information will be visible on a smart phone. I appreciate your replies to all questions. You are free to withdraw your participation at any time without penalty. The survey should only take 20 minutes to complete. The deadline for completion and submission of the survey is XXXX X, 2020. Please click on the survey link provided to access the consent form and to begin the survey: <https://www.zoomerang.com/Survey/U2NE87CCBYJH>

If you are interested in being interviewed about your experience of the event please include your contact information at the bottom of your completed survey and I will contact you.

If recalling this event is causing you pain, distress or any other form of discomfort, please know that there are resources available to you. The AANA recommends:

“...seeking emotional support, such as peer support, self-help groups, or professional counseling. Does your workplace have an Employee Assistance Program (EAP)? If not, talk to your personal healthcare provider for recommendations on counseling and support and see the following resources.

You are not alone - for assistance contact

AANA Peer Assistance Helpline  
**(800) 654-5167”**

24/7 confidential live support and resources.

Sincerely,

Michael W. Neft, DNP, MHA, CRNA, FNAP, FAAN

PhD Student

Duquesne University

[neftm@duq.edu](mailto:neftm@duq.edu)

## Appendix B

### Demographic Information:

Age

Gender

Years in Nursing (total, including nurse anesthesia)

Years in Nurse Anesthesia

Basic Nursing Education: Diploma, ADN, BSN

Basic Nurse Anesthesia Education: Certificate, Bachelor's, Master's, Doctorate

Current Highest Degree:

What type of clinical practice were you in when the event occurred (e.g. pediatrics, general adult, etc)

What was your practice mode at the time of the event (e.g. anesthesia care team, independent practice, etc)? \_\_\_\_\_

If you are willing to be a participant in the study you will be completing two survey instruments in addition to this, I would like to ask if you are willing to participate at a later date at your convenience in a one-on-one personal interview to discuss your event. All interviews will be kept completely confidential. Please provide the following information if you are willing to participate:

Preferred method of contact:

- Name
- Phone
- Email

All information will be kept in complete confidence

Appendix C1

Thank you for agreeing to participate in this survey, you are being asked to complete the survey related to two time points:

1. The first time the researcher is asking you to think about your level of stress during the month immediately after the critical event.
2. The second survey should reflect how you are feeling currently.

**PCL-5-  
VERSIO  
N A**

**Instructions:** Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem. **Indicate how much you were bothered by the critical event in the month following the event.**

<b>In the past month, how much were you bothered by:</b>	<b>Not at all</b>	<b>A little bit</b>	<b>Moderately</b>	<b>Quite a bit</b>	<b>Extremely</b>
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4



10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being “superalert” or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

**PCL-5**(14 August 2013)

National Center for PTSD PCL-5

Open ended questions:

“What was the event you were involved in?”

“Did you receive some sort of support after the event”?

“Did your use of substances increase after the event”,

“If so, how so?”

”What substance(s) did you use?”

If recalling this event is causing you pain, distress or any other form of discomfort, please know that there are resources available to you. The AANA recommends:

“...seeking emotional support, such as peer support, self-help groups, or professional counseling. Does your workplace have an Employee Assistance Program (EAP)? If not, talk to your personal healthcare provider for recommendations on counseling and support and see the following resources.

You are not alone - for assistance contact

AANA Peer Assistance Helpline

**(800) 654-5167”**

24/7 confidential live support and resources.

## Appendix C2

Thank you for agreeing to participate in this survey, you are being asked to complete the survey related to two time points:

1. The first time the researcher is asking you to think about your level of stress during the month immediately after the critical event.
2. The second survey should reflect how you are feeling currently.

### PCL-5 VERSIO N B

**Instructions:** Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem. **Indicate how much you were bothered by the critical event in the month following the event.**

In the past month, how much were you bothered by:	Not at all	A littl e bit	Mo der atel y	Qu ite a bit	Extremel y
1. Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2. Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4. Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6. Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8. Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4

10. Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12. Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13. Feeling distant or cut off from other people?	0	1	2	3	4
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15. Irritable behavior, angry outbursts, or acting aggressively?	0	1	2	3	4
16. Taking too many risks or doing things that could cause you harm?	0	1	2	3	4
17. Being “superalert” or watchful or on guard?	0	1	2	3	4
18. Feeling jumpy or easily startled?	0	1	2	3	4
19. Having difficulty concentrating?	0	1	2	3	4
20. Trouble falling or staying asleep?	0	1	2	3	4

**PCL-5**(14 August 2013)

National Center for PTSD PCL-5

If recalling this event is causing you pain, distress or any other form of discomfort, please know that there are resources available to you. The AANA recommends:

“...seeking emotional support, such as peer support, self-help groups, or professional counseling. Does your workplace have an Employee Assistance Program (EAP)? If not, talk to your personal healthcare provider for recommendations on counseling and support and see the following resources.

You are not alone - for assistance contact

AANA Peer Assistance Helpline

**(800) 654-5167”**

24/7 confidential live support and resources.

## Appendix D

### Semi-structured interview questions:

Thank you for agreeing to participate in this interview; your interview will be identified only by a number and your name will never be revealed to anyone.

I would like to ask you about the critical incident in which you were involved.

Can you tell me what that was like for you?

Followed by cues to elicit further information if needed:

- Can you tell me more about that?
- Can you tell me about how things have been for you since the critical incident?
- Can you talk about the support you received?

Do you have a current health issue that was affected by the critical event?

At the end of the interview: Is there anything else you would like me to know before we end this interview?

Thank you so much for your time. Do you have any questions for me?

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## Chapter 3

MS #2 will be presented here when submitted for publication, immediately after the final defense. This is a draft of the MS which has been submitted to the AANA Journal for review (produced here in draft form with the Editor-In-Chief's permission). It is in AMA Style as required by the *AANA Journal*.

### The Lived Experience of Second Victim CRNAs

#### Introduction

This mixed methods study focused on the lived experiences of the Certified Registered Nurse Anesthetist (CRNA) second victims. *First victims* in critical events are patients and their families; they are the first priority regarding care and concern. *Second victims*<sup>1</sup> are health care workers involved in a critical event. These events usually occur in the workplace and are usually sudden and unexpected. Examples of critical events may include hemorrhage, death, cardiopulmonary arrest, or violent behavior. Practitioners define themselves as second victims based on their self-perception of what happened in the event, their role in it, and their emotional response. Significant emotional experiences<sup>2</sup> such as anxiety, guilt, sadness, shame, embarrassment, and anger for other healthcare workers who were second victims have been identified in research. Some may even leave their professions due to the event and its subsequent emotional extension. Unfortunately, there is little known about the CRNA experience as second victims. This study was conducted to understand this experience with the goal of informing nurse anesthesia professionals and other health care providers about this phenomenon.

Participants in a study dealing with second victim support expressed that different forms of communication would be important to them in working through their feelings in the aftermath of a critical event.<sup>3</sup> Debriefing, discussion of ethical concerns, contributing to methods to prevent similar incidents from occurring, information about the investigative process and how they can access emotional support, if needed, were deemed important by the participants.

In many facilities, when critical events occur, healthcare professionals are advised to downplay the incident.<sup>4</sup> In this type of organizational culture, where critical events are not addressed openly, staff are often fearful, patient safety events are used to blame and criticize, therefore staff do not discuss them, resulting in poor coping.<sup>5</sup> A patient safety event differs from a strictly clinical event where an unexpected disease complication or trauma occurs resulting in a situation that staff find difficult to work through from an emotional perspective. Staff can emerge as second victims from both types of situations. An example of a clinical event might be a multiple trauma case that presents to a small community hospital emergency room; the staff in such a facility may not be accustomed to or equipped to care for such a case, however they have no choice but to proceed. The aftermath of caring for such a patient may leave staff with emotions that they find difficult to face. Clinicians need to be supported after a critical incident, by interventions such as debriefing<sup>6,7</sup> so they can determine why the incident happened and how similar incidents can be avoided in the future.<sup>6,8</sup> Although we have knowledge regarding other healthcare professionals related to becoming a second victim such as nurses, physicians, social workers, and coroners<sup>5,8-12</sup> we do not have the same robust studies concerning CRNAs. The specific aims of this study were to identify the level of stress experienced by the CRNA at the time of a critical event and later at the time of the study, and to document the lived experiences of a CRNA who becomes a second victim after being involved in a critical incident.

### **Research Questions**

Quantitative Strand: What is the relationship between the perceived level of stress experienced by the CRNA at the time of a critical event and at the time of the study, as measured by the Post-Traumatic Stress Checklist-5 (PCL-5)?

Qualitative Strand: What is the lived experience of a CRNA who becomes a second victim after being involved in a critical event?

### **Methods**

The methodology for this project was the convergent mixed methods design. This design was selected to provide more in-depth information than in a quantitative or

qualitative study alone. The mixed methods design allows for a more complete evaluation of the problem.<sup>13</sup> The qualitative data was analyzed first, followed by analysis of the quantitative data so that the results of the quantitative strand did not influence the results of the qualitative strand. The two strands were then compared and interpreted for a complete view of the experiences a nurse anesthetist may experience when s/he is involved in a critical event.

### **Setting**

Interviews for the qualitative strand were conducted via ZOOM™ due to COVID-19 pandemic restrictions on in-person interviews. The timing of the interviews was mutually agreed upon. The quantitative surveys were completed by participants on-line via Qualtrics platform.

### **Sample Population**

The population studied was Certified Registered Nurse Anesthetists (CRNAs) who are members of the American Association of Nurse Anesthetists (AANA). Inclusion criteria included CRNAs who perceived themselves to be a second victim. There were no exclusion criteria. Participants in the quantitative survey were invited to participate in an individual interview to discuss their experience. They were provided with the researcher's email address so that they could self-identify and consent to participating in the interviews.

For clarity purposes, all information related to the qualitative strand will be presented first. All information related to the quantitative strand will be presented next, followed by all information and data related to the mixed methods analysis.

### **Qualitative Strand**

The qualitative strand addressed the research question: *What is the lived experience of a CRNA who becomes a second victim after being involved in a critical event?* The goal of the qualitative strand was to elicit the lived experience of a CRNA who experienced a critical event and became a second victim. A subset of the participants (n=4) in the quantitative strand consented to participate in an interview to explore the lived experience of having been involved in a critical event. The qualitative strand followed the tenets of Hermeneutic Phenomenology, utilizing open-ended interview questions in order to provide a voice to the participants.<sup>14</sup>

#### **Procedure: Qualitative Strand.**

The qualitative strand addressed the research question and utilized a semi-structured, open ended interview guide with the goal of eliciting the participants specific experiences about the critical event they were involved in. If they were involved in more than one critical event during their careers, the researcher asked them to focus on only one.

The researcher posed probing, non-leading questions as needed to elicit richer information and data.<sup>15 16</sup> The goal of hermeneutic phenomenology is to “describe the meaning of a phenomenon and understand the contextual forces that shape it”.<sup>17</sup> In order to truly understand the lived experience of another we must use language as a tool: not only language as we know it, but language as the people who we want to learn about use it. We have to “dwell” in their language with them, setting aside any preconceptions we may have in order to truly hear and understand what they are saying. Listening to what they say, how they say it, and analyzing what they say for patterns of thought, feeling, emotion, and experience are crucial to understanding them. Interviews with participants

are conducted until data saturation is reached, i.e. the same themes (nothing new) emerge during analysis.<sup>18</sup>

### **Qualitative Methods**

Qualitative data was analyzed by Ricoeur's method of data interpretation which includes a 3-phase process for data interpretation<sup>19</sup>. The first phase, "explanation", analyzes the interview transcripts and the researcher's journal notes to identify "free nodes"<sup>19</sup>; emerging ideas. Words are accepted as spoken or written; there is no attempt at interpretation, as documents must be re-read to assure that nothing the participant has expressed is missed.

In phase two "Naïve understanding", the free nodes are studied for the same or closely related ideas which are grouped into subthemes. Thus, the analysis is conducted as a dialectical process, moving from "what is said and/or observed" to "what the text speaks about," leading to the emergence of patterns, subthemes, and main themes.

The ideas under each subtheme are examined and themes are created as needed. The naïve level of understanding achieved in level 2 analysis is based on the internal nature of the text and includes making decisions about similar or near identical meaning of particular words and phrases<sup>19</sup>.

In phase 3 an "In-depth understanding", involves the "hermeneutic arc" : the researcher moving back and forth between explanation and understanding<sup>19</sup>. Interpretation starts with the researcher acknowledging his/her own experience and beliefs, i.e. what s/he bring to the project in terms of these areas. The next area is the researcher's knowledge and experience about the study participant. A goal here is

recognizing how the parts brought forth in the coding; subtheme, theme, and category development relate to the whole <sup>20</sup>, i.e. the participant's lived experience.

The qualitative data were derived from the interviews and analyzed as they were completed in order to strengthen future interviews to delve more fully into the phenomena, or to go back to an interviewee to clarify certain questions. Notes were kept during each interview in order to record expressions of emotion, changes in vocal intonation, and if communication techniques such as pausing at certain intervals or during certain parts of the discussion are used. Notes were reviewed after each interview, in order to assure clarity. The researcher conducted thematic analysis of the data. Interviews were conducted on the four who volunteered to take part in the qualitative strand. Participants all approved the verbatim transcripts without any need for clarification or further interview.

### **Qualitative Results and Discussion**

There were four participants in the qualitative strand. The demographic data for the qualitative strand participants: Age range: 34-65 years; years in nursing: 11-41; years in nurse anesthesia: 6-34; Basic nursing education was an associates degree for two of the participants, and a BSN for the other two people; anesthesia education was a certificate for one person and a masters degree for the other three participants; the highest degree attained for all participants was a masters degree.

Four patterns and three themes were derived from the qualitative data analysis. The four patterns were: 1. The aftermath of the event has both positive and negative sequelae for all involved. 2. The event was perceived as catastrophic for patients, families, and staff. 3. Self-reflection post event caused self-doubt about the care given. 4.

Up to the time of the event perceived due diligence was exercised in the care performed.  
(Qualitative strand analysis can be found in Appendix A)

Three themes generated from the analysis of data included: 1. Anesthesia involves risk(s) for patients and CRNAs; vigilance must always be maintained to mitigate risk(s). 2. Constant open communication between families, patients, and peers is essential in informing optimal patient care before and after any events. 3. Support received and accepted by CRNAs from peers post event was helpful and appreciated in dealing with the event.

**Anesthesia involves risk(s) for patients and CRNAs; vigilance must always be maintained in order to mitigate risk(s).** The risks of anesthesia for patients are related to their underlying disease processes and/or injury and how those will interact with anesthetic drugs/techniques.

“...Nobody sets out to cause an air embolism, it’s just one of those things that happened; it’s one of those risks of surgery”, was a statement made by a participant in this study. This feeling expressed the realization that when everything seems to be going smoothly during a case, the unexpected may happen, leading to tragic consequences. “And so it’s made me appreciate how...what we do is really very dangerous”; the participant in this case is noting that CRNAs must always be providing watchful care because unforeseen complications can happen that must be dealt with immediately.

CRNAs must always anticipate and be prepared for any physiologic complication that may occur. The surgeon manages a specific problem (e.g. abdominal aortic aneurysm), however the CRNA must manage the patient’s physiology, co-morbidities and the anesthetic in such a way that the patient remains physiologically stable

throughout the case. An example of this is managing key parts of the anesthetic when surgical manipulation will make the patient unstable (e.g. when the aortic cross clamp is placed or removed during an abdominal aortic aneurysmectomy, or when massive blood loss occurs). The risks that anesthesia presents for the CRNA involve the amount of stress that accompanies the profession. Some examples are the need to be constantly vigilant for any small change in the patient's condition or in the progress of the surgery (i.e. is the surgeon encountering problems which impact the patient's physiology and therefore the work of the CRNA), the need to constantly respond to alarms, divide one's attention between monitors, the surgical site, and communication with the OR staff. Consequently, CRNAs must be ready to intervene at a second's notice to multiple possible issues. CRNAs must be able to defend intra-operative actions taken to their peers, departmental leadership, the surgeon(s), facility risk management, and possibly legal counsel.

**Constant open communication between families, patients, and peers is essential in informing optimal patient care before and after any events.** “We worked really hard to resuscitate this kid...I was trying to get arterial access...the surgeon is...working on the chest, trying to get bleeding controlled”. As noted above, surgical interventions can have a direct impact on patient physiology, as can anesthetic agents and techniques. Therefore the surgeon and CRNA must be in constant communication so that they know what issues the other may be dealing with (e.g. blood loss on the surgeon's side or vital derangement or airway problems on the CRNA's side), so that they can intervene to effectively support the patient. Clear peer communication is necessary, especially when handing off care and when help is needed during a crisis. Because



CRNAs only have a few minutes to develop a rapport with patients and their families before being taken to the operating room, trust has to be built quickly with them so that they know they/their loved one will be well cared for.

**Support received and accepted by CRNAs from peers post event was helpful and appreciated in dealing with the event.** The CRNAs interviewed for this study wanted to talk with someone who understood their work and the event that occurred. Other anesthesia providers, surgeons, and OR nurses/technicians provided that support. “There was nothing formal, but it’s a small enough and close enough that team, where things like that didn’t necessarily have to be formal. People would readily be able to talk, checking on each other, phone calls or text messages...”. They tried to talk with family members and friends outside of anesthesia, but these people, however much they may care about the CRNA, do not understand the work or the situations the CRNAs encountered, therefore talking with them was of little utility. The CRNAs were happy with the conversations they had with other professionals who were involved in the same case, or who were part of their professional milieu and understood their work and the events that had occurred.

In summary, the four participant interviews reflected their desire to talk about the event to people who could understand what they had experienced; some were able to do so, and some were not. They were able to articulate their feelings about the event clearly with little emotion to the researcher. While they all may have suffered a great deal of stress and emotional discomfort from their events, they ultimately learned how to live with the event in terms of memories, level of stress, and continued clinical practice as time progressed.

## Quantitative Strand

The quantitative research question *What is the relationship between the perceived level of stress experienced by the CRNA at the time of a critical event and at the time of the study, as measured retrospectively by the Post-Traumatic Stress Checklist-5 (PCL-5)?* was measured using the Post-Traumatic Stress Checklist-5 (PCL-5)<sup>21</sup> survey. This survey measured the stress levels of anesthetists at the time the critical event occurred and then at the time they are involved in the study. If they were involved in more than one critical event in their careers, they were asked to isolate their responses to one particular event that they considered to be the most troubling.

**Procedure:** Approximately 86% of CRNAs in the United States belong to the AANA. The PTSD Checklist-5 (PCL-5) was distributed to the membership through the AANA Foundation via electronic communication to randomly selected members (n=3000). Participants were asked to complete PCL-5, including five open ended questions, to measure initial stress and then to measure current stress.

### Quantitative Instruments

The variables that the quantitative strand measured were stress symptoms. Three additional questions and two sub-questions were added to the end of the first iteration of the survey the participants completed. They queried the type of event the CRNA was involved in, the support received, and did their use of substances increase after the event (with two sub questions: “If so, how so”? and “ What substances did you use?”. The Post-Traumatic Stress Disorder (PTSD) Checklist-5 (PCL-5)<sup>22</sup> is meant to measure symptoms over time.

The revised PCL-5 is a 20-item, self-report tool that assesses the 20 symptoms of PTSD noted in the DSM-5. It can be used for three different aspects of patient care: monitoring symptom change, PTSD screening, and provisional PTSD diagnosis.<sup>22,23</sup> The 20 items are scored on a Likert scale of 0= not at all, to 4 = extremely; with a total possible score of 0-80. Overall, the PCL-5 is found to have sound psychometric properties. Studies demonstrate good convergent and discriminant validity, test-retest reliability, and internal consistency (See Appendix D for PCL-5 results).<sup>22,24</sup>

### **Power Analysis**

A thorough review of the literature revealed that no research has been conducted that measures the anxiety level of second victim CRNAs over time. The only research that was identified related to programs that support second victims was focused on the use of the support programs by clinicians. The main areas examined in these studies were staff knowledge about the program and its use. The present study differed from previous studies in that it studied the second victims' perceived stress levels over time.

The estimated effect size for this study (Cohen's D) was 0.5, or medium. It was thought that there might be great variability in the time span between when the CRNAs became second victims and the time of the surveys. The statistical test that was used to compute a sample size estimate was a two-tailed dependent sample t-test because there is no previous research that identifies the direction of the stress level in a similar population. G\*Power software was used to calculate the sample size for a two-tailed test with a conservative effect size of 0.3, an alpha of 0.05, and a conservative power of 0.90. The number of participants computed was 119.

### **Quantitative Data Analysis**

Fifty-two participants completed the surveys out of 3000 that were deployed: 35 females and 17 males. Ages of the participants ranged from 30 years of age to 68 years of age. Participant's years in practice were between 1 and 37 years. They practiced in different clinical areas and practice models. Of the 74 surveys, 52 were completed. The data were ordinal, Likert scale responses to items on the PCL-5 and were analyzed using the Wilcoxon matched-pair signed-rank test. To further understand the relationship between initial and current total PCL-5 scores, a repeated-measures linear Generalized Estimating Equations model was developed. After univariate screening the following predictors were selected: time, gender, age, nature of support after the event, patient outcome, and nature of the event.

With two exceptions the PCL-5 scores decreased from the time the event took place to the time of the study. The first exception noted was: "Trouble remembering important parts of the stressful experience" ( $p=0.167$ ). The significance of this is that over time, the participants stress levels fell. The second exception was "Taking too many risks or doing things that could cause you harm". In both of these components of the PCL-5, the initial and current median value was 0, suggesting that symptoms described were not prominent initially and therefore there was little room for improvement (Appendix C).

Appendix D shows the results of the General Estimating Equation (GEE) analysis. The observations made were at two different time points. Initial and current. Six models were built sequentially with the following predictors: Time point, age, gender, support after event, patient outcome and nature of the event. The Goodness of Fit tests i.e., Quasi Likelihood under Independence Model Criterion (QIC) and Corrected Quasi Likelihood

under Independence Model Criterion (QICC) results demonstrate improvement in fit with the addition of each predictor. Except for gender, all were statistically significant predictors.

### Mixed Methods Analysis

The qualitative strand documented that participants were deeply affected by the critical event they were involved in at the time it occurred. It also established that they were able to take a more circumscribed view of the event as time progressed, understanding its causes and their role in the care of the patient. The signs and symptoms of stress that were discussed were “being upset”, “crying”, “being hypervigilant”, “being exceptionally cautious”, feeling like they would have a panic attack if anything the least bit untoward occurred when they would not have experienced this before the event; feeling like they were “a fraud”; “self-blame”; “self-doubt”; “questioning their performance and decision making”; and “flash backs”.

The initial stress scores on the PCL-5 established that the participants demonstrated signs and symptoms of stress. The following received the highest scores for the time of the event: repeated, disturbing, and unwanted memories of the stressful experience; feeling very upset when something reminded you of the stressful experience; blaming yourself or someone else for the stressful experience or what happened after it; having strong negative feelings such as fear, horror, anger, guilt, or shame; being “super alert” or watchful or on guard. The second iteration of the PCL-5 that the participants completed demonstrated that stress symptoms decreased overall. There could be several reasons for this; for example, the emotions degrade over time as the participant moves further away from the event temporally, other life issues arise that take precedence, or

perhaps the participant is able to see the event more objectively, is able to think about it with increased clarity and understands it more fully.

The qualitative data supported the findings of the quantitative data and helped to clarify levels of stress at the time of the critical event and at the time of the study. Initially stress levels were high, but as time progressed, overall stress levels receded. Stress levels may have fallen due to a variety of reasons: support from colleagues and friends, gaining a better understanding of the event and its genesis, and gaining more perspective of the event as they became temporally removed from the event.

### **Limitations**

Lack of participants was a clear limitation, especially in the qualitative strand. Initially it was thought that many practitioners would want to discuss COVID-19 related incidents, however this did not transpire. It can only be speculated that the incidents may have been too recent, and perhaps on-going, for the people to want to discuss them. It is also possible that the CRNAs felt that so many of them have events related to COVID-19 that too many people would want to talk about their incidents, so they chose not to share.

Quantitative data collection took place over one month. It was during this period that volunteers were solicited for participation in the qualitative strand. One month may not have been long enough and perhaps should have been extended to a longer time period. If this had been done, there would have been more time for people to complete the PCL-5 and to volunteer for the qualitative strand. Perhaps qualitative strand participants should have been recruited separately from the quantitative strand; maybe an email call for volunteers should have been sought, coupled with a small ad in an AANA publication. Asking the length of time that passed between the time of the critical event

and the time of the study was not considered for inclusion in the quantitative portion of the study. This was a significant error and will not be omitted in future studies.

A further possible limitation is the depth and breadth of the interviews in the qualitative strand. Participants expressed only what they wanted to during the interviews. The method of phenomenology does not allow the researcher to lead the participant, therefore the participant may have held back details they did not wish to discuss. Participants were not asked about the length of time between their critical event and the time of the study. Length of time may have helped to identify a variable that impacted level of stress over time.

### **Implications for Future Study**

Consistency was noted in the four interviews included in this study, which provided rich information. While saturation was approached with the four participant interviews in the qualitative strand, it would have been ideal to have more participants. No participants were in institutions with post-second victim support. It may be important to recruit a broader pool of participants. The reason for only attracting participants who did not have access to support may be why they wished to participate. Those who had professional support may have felt it was not important to participate in this study. Institutional culture should be considered in future studies. A facility with a supportive and positive culture offers meaningful discussion of the event and assistance versus institutions with a negative culture where blame assignment and accusation are highlighted.<sup>25</sup> Many second victims fear litigation surrounding the event.<sup>26</sup> Consequently this needs to be taken into consideration when developing and studying potential support methods. Some possibilities for accessing more participants include PANA and other

state organizations. Advertisements can be placed in AANA publications offering participation at the time the events occur.

The study of second victim CRNAs as the events occur (i.e., in real-time, or as close to real-time as possible) would be productive in that the participants could express their feelings as the events emerged post-event. In this way, clearer knowledge might be gained about how best to help second victims. The AANA has a hotline where these types of cases can be reported and help sought; the researcher could partner with the organization to offer participation in the study. without involvement of the AANA's hotline.

Incorporating education about second victim CRNAs into the curriculum of nurse anesthesia programs is imperative.<sup>27</sup> It is important for students and CRNAs to understand what a second victim is, the type of help one may need, and how to reach that help. Many CRNAs were not taught as students to acknowledge feelings after critical events. They were also not taught coping skills or how to procure help for themselves about their feelings and perceptions surrounding critical events. Even if individual CRNAs have never experienced second victimhood<sup>27</sup>, it is important that they understand the phenomenon so that they can help their students, colleagues and recognize the possible need for help in themselves.



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## Appendix A: Qualitative Strand Analysis

### Appendix A: Qualitative Strand Analysis: Nodes, Patterns, Themes.

Nodes	Patterns	Themes
Patient crisis/death	The aftermath of the event has both positive and negative sequelae for all involved.	Anesthesia involves risk(s) for patients and CRNAs; vigilance must always be maintained in order to mitigate risk(s).
Self-expectations/self-blame	The event was perceived as catastrophic for patients, families, and staff.	Constant open communication between families, patients, and peers is essential in informing optimal patient care before and after any events
Stress	Self-reflection post event caused self-doubt about the care given.	Support received and accepted by CRNAs from their peers post-event was helpful and appreciated in dealing with the event.
Risk of surgery and anesthesia for patients and staff	Stress, crises, teamwork, vigilance inform the daily practice of anesthesia.	
Team work		

### Appendix B : Demographics

74 surveys deployed ; 52 completed			
Gender	Male : 17	Basic Nursing Education	Certificate : 3 Associates : 5 Bachelors : 42
	Female : 35	Basic Nurse Anesthesia Education	Certificate : 7 Associates : 1 Bachelors : 3 Masters : 40 Doctorate : 2
Age	30-68 years	Highest Degree Held :	Certificate : 1 Associates : 1 Bachelors : 1 Masters : 37 Doctorate : 12

Years in Nurse Anesthesia Practice	1-37 years		
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Appendix C: Comparison of self-reported estimates of initial and current symptom severity by PCL Questions

Symptom per PCL-5	N	Sum	Min	Max	N	Sum	Min	Max	p Value
#1	63	113	0	4	53	43	0	4	0.0005
#2	63	47	0	4	52	18	0	3	0.007
#3	63	57	0	4	53	24	0	3	0.003
#4	63	100	0	4	53	51	0	4	0.002
#5	63	80	0	4	53	37	0	4	<0.0005
#6	63	82	0	4	53	40	0	3	<0.0005
#7	63	69	0	4	53	39	0	3	0.014
#8	63	50	0	4	53	31	0	3	0.167
#9	63	80	0	4	53	45	0	4	0.004
#10	63	107	0	4	53	63	0	4	<0.0005
#11	63	101	0	4	53	46	0	4	<0.0005
#12	63	52	0	4	53	26	0	4	0.001
#13	63	57	0	4	52	36	0	4	0.025
#14	63	47	0	4	52	26	0	4	0.012
#15	63	51	0	3	53	20	0	2	0.001
#16	63	24	0	3	53	12	0	2	0.058
#17	63	120	0	4	52	52	0	4	<0.0005
#18	63	61	0	4	53	29	0	4	0.003
#19	63	55	0	3	53	33	0	4	0.033
#20	63	98	0	4	53	58	0	4	<0.0005
Total PCL Score	62	1414	1	58	50	725	0	54	<0.001

Abbreviations: MED=Median; MIN=Minimum; MAX=Maximum; IQR=Interquartile Range. Initial and current symptom severity were compared using the related-samples Wilcoxon signed rank test.

Appendix D : GEE Model parameters

Model	Predictor added	Goodness of Fit		Test of Model Effects in Model 6		
		QIC	QICC	Wald Chi-Square	df	p-value
1	Time Point	14091.434	14091.448	12.551	1	<.001
2	Age	13012.247	13011.595	4.345	1	.037
3	Gender	12237.003	12236.462	2.791	1	.095

4	Support after Event	10822.405	10823.604	44.833	5	<.001
5	Patient Outcome	9100.437	9101.328	8.267	2	.016
6	Nature of Event	8457.820	8468.124	150.209	6	<.0005

Quasi Likelihood under Independence Model Criterion (QIC) and Corrected Quasi Likelihood under Independence Model Criterion (QICC) in smaller-is-better form and computed using the full log quasi-likelihood function. Abbreviations: df, degrees of freedom