International Journal of Emergency Mental Health and Human Resilience, Vol. 17, No.3, pp. 661-663, ISSN 1522-4821

Catastrophic Events in the Perioperative Setting: A Survey of U.S. Anesthesiologists

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What is known about this topic	What this paper adds to the topic
• Catastrophic events in the perioperative setting can have a profound impact on the practitioners involved. • Impacted practitioners, or second victims often experience symptoms such as depression, loss of confidence, and sleep deprivation following an event. • Formal and informal post-event support improves the practitioner's recovery experience.	• Assessment of the proportion of U.S. anesthesiologists who have experienced such events and type(s) of support that occurred. • Description of the experience of catastrophic events and subsequent recovery specific to anesthesiologists. • Exploration of the potential association between respondent characteristics, event details, and event recovery time. • Assessment of the prevalence of support programs at respondent institutions and opinions of the anesthesiologist community regarding ideal support.

ABSTRACT: *Catastrophic events in the perioperative period can adversely impact the well-being of the healthcare workers involved. These second victims may experience symptoms including depression, isolation and loss of confidence related to the event. A limited amount of published research suggests those who receive formal support (e.g. departmental debriefing) may have an improved recovery experience.*

This cross-sectional study was conducted to assess the proportion of U.S. anesthesiologists who have experienced catastrophic perioperative events and bring into focus the association between event details, respondent characteristics and utilization of formal support with recovery time. Additionally, we aimed to ascertain the current state of post-event formal support and opinions for ideal event handling across the anesthesiology practice.

A seventeen-question survey was distributed to 5,000 attending anesthesiologist members of the American Society of Anesthesiologists (ASA). 289 responses were received. 85% report having experienced a catastrophic event; greater than 80% of those involved a death. 42% took a few days or less to recover yet 24% took a year or more. 31% had department debriefing and 25% had multidisciplinary debriefing. No association between gender, practice setting, years of experience and recovery time was detected. Comments revealed highly individualized recovery experiences and heterogeneity in processes for post-event debrief.

Regarding current, institutional practice: 56% report there is no departmental debriefing team and 16% do not know if such a team exists. 49% feel debriefing should be mandatory. Comments reflect a variety of opinions regarding ideal support. Resources that address the complexities of the recovery experience should be thoughtfully developed and made available to those who may benefit from them.

INTRODUCTION

Healthcare workers often experience post-traumatic stress after a catastrophic event. These second victims may have a multitude of both physical and psychosocial symptoms that greatly impact their professional performance and personal well-being. A second victim, as first defined by Wu in 2000, is a healthcare worker who becomes victimized as a result of a patient-related traumatic event. Wu highlighted the lack of institutional mechanisms to provide second victims with support (Wu, 2000).

To better understand the second victim phenomenon, Scott et al completed in-person interviews with thirty one healthcare workers across various specialties. The authors identified a common second victim trajectory of six distinct stages of recovery and called for the development and deployment of appropriate support (Scott et al., 2009). In 2010, the same group published an article describing their experience with a second victim rapid response team. A needs assessment across six facilities was conducted with subsequent creation of a tiered interventional model of support. At the heart of this model is a network of trained clinicians readily available in high-risk areas to come to a second victim's aid (Scott et al., 2010). In 2012, Wu et al described the importance of providing a method by which second victims can discuss errors safely with compassionate, trustworthy, and reassuring colleagues. Wu made the important point that second victim symptomatology may arise at any time after the event, and that even when formal debriefing exists, this may not actually support the second victim's personal recovery as intended (Wu & Steckelberg, 2012).

The question as to whether the second victim experience is different for anesthesiologists was explored by Gazoni and colleagues. In a 2008 review, the authors gave consideration to anesthesiology as a high risk specialty, mostly due to increased rates of drug abuse and suicide as compared to other specialties (Gazoni, Durieux & Wells, 2008). The same authors then published the results of a national

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survey specific to U.S.-based anesthesiologists and perioperative catastrophes. Results from this descriptive study indicated a high burden of second victims among those surveyed; more than 70% experienced symptoms such as guilt and almost 20% acknowledged they have never fully recovered. Also reported in this study was desired types of support; 98% thought talking with anesthesia personnel was helpful, 89% preferred debriefing with the operating room team and 87% felt talking with the patient's family was a good support resource (Gazoni, Amato, Malik & Durieux, 2012)

To date, little is known about the prevalence of formal, local support resources available to U.S. anesthesiologists and if those resources, once used, result in a better second victim recovery experience. Our study aims to address both points.

METHODS

We distributed a seventeen-question survey to 5,000 randomly-selected attending anesthesiologist members of the American Society of Anesthesiologists (ASA). A link to the survey was distributed by email and responses were received by March 2012. Two reminder emails were sent and no incentives were offered. Survey content was informed by recent publications of surveys covering the subject of interest, questions that arose during workshops facilitated by the authors at both national and international meetings, and peer review activities for adverse events at the authors' institutions. Organizational resources were utilized for survey methodology and design. Answer formats included single answer, multiple answer and free text. Answers were not mandatory; participants could skip any question and still continue through the survey.

For the analysis, response categories for two questions were collapsed into a smaller number of categories based on similarity. For "practice setting" we used two units of analysis: AC/RC (academic center combined with referral center) and SC/CH/other (surgery center combined with community hospital and "other"). For "time to recovery" we used four units of analysis: few days or less (<24h combined with few days), 1 week, 1 month, and 1 year or more (1 year combined with > 1 year). For the purposes of the study, a shorter recovery time is considered an "improved" recovery experience. The chi-squared test was used to determine the presence of an association between select categorical variables and response time. Data was analyzed in Microsoft Excel.

RESULTS

289 responses were received (5.8% response rate). Respondent characteristics are listed in Table 1. The majority of respondents were from academic centers, had more than 20 years of experience, and were male. 85% report experiencing a catastrophic event in the perioperative setting at some point in their careers (Table 2). Of those, more than 80% involved a death. Other types of catastrophic events experienced include anaphylaxis, anoxic brain injury, drug error, massive hemorrhage, venous air embolism, etc. When asked about the most significant catastrophic event of one's career, 44% report the event was expected, 28% felt it was preventable, and 6% felt it was their fault.

Table 1.
Respondent Characteristics

Category	Sub-Category	No. (%)
Practice Setting	Academic center	105 (36)
	Community hospital	72 (25)
	Referral center	66 (23)
	Surgery center	32 (11)
	Other	14 (5)
Years in practice*	>20	122 (42)
	10-20	103 (36)
	0-10	63 (22)
Gender*	Male	206 (71)
	Female	80 (28)

*not completed by all respondents so may not add up to 289.

Table 2.
Catastrophic Event Experience

Category	Sub-Category	No. (%)
Experienced event	Yes	245 (85)
	No	35 (12)
Event type	Death	195 (80)
	Other□	50 (20)
Perceived reason for event□	Expected	107 (44)
	Preventable	68 (28)
	Result of error	38 (16)
	"My fault"	14 (6)
Post-event experience□	Feelings of guilt	122 (50)
	Difficulty sleeping	79 (32)
	Confidence effected	71 (29)
	Performance effected	49 (20)
	Feelings of isolation	43 (18)
	Difficulty concentrating	40 (16)
	Change in appetite	22 (9)
	Alcohol/self-medication	13 (5)
Time to recovery	A few days or less	104 (42)
	1 year or more	59 (24)
	1 month	36 (15)
	1 week	18 (7)

Events were experienced by 245; denominator used in each category in this table is 245.
□cardiac arrest, massive hemorrhage, drug error, venous air embolism
□multiple answers allowed, may add up to more than 100%

Table 3.
Support that Occurred after Catastrophic Event

Category	Sub-Category	No. (%)
Time off from work	No	212 (87)
	Yes, < 24 hours	7 (3)
Support that occurred□	Talking with colleagues	144 (59)
	Risk Management/Quality	98 (40)
	Department debriefing	75 (31)
	Multidisciplinary briefing	62 (25)
Disclosure to family	Surgeon	206 (84)
	Anesthesiologist	125 (51)
	Both	112 (46)

Events experienced by 245; denominator for each category is 245.
□multiple answers allowed, may add up to more than 100%.

Respondents experienced a range of symptoms, the most common of which were feelings of guilt (50%) and difficulty sleeping (32%). Almost half (49%) reported their confidence and/or performance was effected. 42% recovered in a few days or less whereas 24% took one or more years to recover. Details regarding the types of support that occurred following the catastrophic event are reported in Table 3. 87% did not take any time off work. 59% sought informal support with colleagues, friends or family. 40% report Risk Management and/or Quality Committee involvement. 31% and 25% had departmental and multidisciplinary debrief, respectively. In 51% of cases, the anesthesiologist participated in disclosure to the family.

Table 4.
Respondent and Event Characteristics and Time to Recovery

Category	Sub-Category	Recovery Time [No. (%)]			
		≤ few days	1 week	1 month	≥ 1 year
Respondent					
Gender	Male	84 (51)	13 (8)	28 (17)	39 (24)
	Female	20 (38)	5 (9)	8 (15)	20 (38)
Practice Setting	AC/RC	65 (47)	8 (6)	22 (16)	42 (31)
	CH/SC/other	39 (49)	10 (13)	14 (18)	17 (21)
Years in practice	0-10	23 (51)	4 (9)	10 (22)	8 (18)
	10-20	37 (45)	10 (12)	14 (17)	21 (26)
	>20	44 (49)	4 (4)	12 (13)	30 (33)
Perceived Reason for Event					
Expected		66 (63)	10 (9)	16 (15)	13 (12)
Preventable		20 (30)	7 (10)	12 (17)	28 (41)
Error		15 (38)	2 (5)	4 (10)	16 (41)
My fault		2 (13)	1 (7)	3 (20)	8 (53)
Support that Occurred					
Time off	None	102 (49)	17 (8)	34 (16)	55 (26)
	Yes, < 24 hours	1 (20)	1 (20)	0 (0)	3 (60)
Informal	Talking to colleagues	65 (45)	10 (7)	26 (18)	42 (29)
Formal	Multidisciplinary debrief	28 (46)	8 (13)	9 (15)	16 (26)
	Departmental debrief	31 (41)	8 (11)	6 (8)	30 (40)
	Risk Management	40 (42)	6 (6)	15 (16)	35 (36)
	Disclosure to family	35 (42)	6 (7)	15 (18)	28 (33)

The association between event details, respondent characteristics, and type of support that occurred is explored in Table 4. Time to recovery was not associated with gender, practice setting or years of practice using the chi-squared test (data not shown). 63% of those who felt the event was expected recovered in a few days or less, while 41% and 53% took a year or more to recover when the event was perceived to be the result of an error or the anesthesiologist's fault, respectively. 49% of those who did not take any time off recovered quickly. 41- 46% of those who utilized informal and formal support resources recovered in a few days or less, whereas 25-40% of those who utilized same resources took a year or more.

For the last part of the survey, respondents were asked to provide details about post-event resources in place at their current institution. 36% feel taking time off is impossible, 21% report it is offered, and less than 1% are mandated to take it. 56% report that a departmental debriefing team is not available and 16% do not know if one exists. Only 13% reporting having a departmental debriefing team and of those, half have used it. 49% think a formal debriefing process should be mandatory. 71% do not think time off should be mandatory. In the event that time off is taken, 39% feel a plan for reentry is necessary. 21% think that either case supervision or decreased acuity of cases may be needed.

CONCLUSION

A significant proportion of anesthesiologists experience catastrophic events in the perioperative setting. These events lead to many well-described second victim symptoms that impact wellness, performance at work, and potentially patient safety. Patients cared for by physicians who are experiencing second victim symptoms may be called third victims, if adverse outcomes occur. Certainly, if a clinician is having difficulty concentrating and sleeping, or is suffering from guilt and intrusive memories of the event, it is understandable that their medical judgment may not be at its best.

It is notable how few participants report having had multidisciplinary or departmental debrief. Perhaps this is because either these resources are not available or the clinician did not seek this out due to commonly experienced barriers such as fear of shaming by colleagues. Given that the majority of respondents had been in practice more than 20 years, it's possible the events recalled occurred 1-2 decades ago prior to the relatively recent shift in healthcare to a culture of reporting and discussing errors. Also, not all events that are catastrophic (e.g. death) may warrant formal debrief, especially if expected. There is probably significant variation among individuals' experiences and the severity of impact. However, it is notable that the most significant catastrophic events in an entire career were characterized largely as unpreventable and not the clinician's error, yet still had a major psychological impact. While some respondents report a quick recovery with no time off, many took a year or more to recover. In fact, in Table 4, one notes a u-shaped distribution for many variables; i.e., the greater proportions either recover quickly or take longer with few in the middle. For example, 49% of those who were in practice for twenty years or more at the time of the catastrophic event recovered in a few days, whereas 33% recovered in a year or more. These two points represent the vertical sides of the "U."

Far fewer experienced a duration of recovery between those two points (1 week or 1 month); this group comprises the bottom-most point of the "U." There are likely several explanations for this not captured by our survey. For example, frequency of exposure to such events varies by sub-specialty. The greater the number of exposures, possibly the faster the perceived recovery time. Involvement in litigation may prolong time to recovery. We cannot draw any firm conclusions about which variables, if any, are truly associated with a short recovery time. In part, this may be because the physician's *perception* of recovery may not be a reflection of actual recovery. Certainly, the concept of compartmentalization, an unconscious defense mechanism used to avoid anxiety and mental discomfort by avoiding the explicit recognition of these self-states, could play a role.

Anesthesiologists participated in disclosure to the family only 51% of the time. As an integral member of the patient's

perioperative experience, the anesthesiologist is an asset to an honest and sincere discussion with the family. This team-based approach can of itself provide support to those involved, thereby preventing feelings of isolation. As well, participation in family conversations may engender mutual trust, minimizing the fear and likelihood of litigation.

We then looked at the current state of support resources. We were surprised at how few reported either having a departmental debriefing resource or not knowing if one exists. This underscores the need for development of protocols that are utilized at the time an event occurs.

Table 5.

Current Practice and Opinions Regarding Ideal Handling

Category	Sub-Category	No. (%)
Time off	Time off is impossible	106 (36)
	Time off is offered	61 (21)
	Time off is mandatory	2 (<1)
Departmental debriefing team	No	162 (56)
	Don't know	46 (16)
	Yes; I have used it	22 (8)
	Yes: I have not used it	15 (5)
Should a formal debriefing process be mandatory?	Yes	142 (49)
	No	102 (35)
Should time off be mandatory?	No	204 (71)
	Yes	39 (13)
If time off is taken, plan for reentry should include:	No plan needed	113 (39)
	Decreased acuity of cases	54 (19)
	Case supervision	5 (2)

Denominator used is 289 (total number of respondents)

Table 6.

Selected Survey Comments

Post-Event Experience & Recovery
"There is a tremendous feeling of isolation and morbid fear about how people perceive you."
"I was told I could not talk with anyone as it would jeopardize my malpractice defense. It was a very isolating time."
"As a senior person with leadership and significant responsibilities in the department, I have no one I feel like I could go to."
"Do you ever really recover after a death???"
"No death is easy even when it is expected."
"There is always another case to do immediately after the 'disaster' case."
"I felt very badly (about a surgical catastrophe resulting in unanticipated death), but got over it quickly. I have had a few "close calls" in young healthy patients that have trouble me much more than the death."
"It remains unclear whether there was actually an error or if I was at fault...9 years later, it still comes to mind and has haunted me."
Type of Support Offered or Desired including Time Off
"Our facility has no organized team or plan."
"It (death in critically ill patient, emergency surgery) was devastating, and there was absolutely no support process. In fact, I felt more like the debriefing process - by individuals who weren't even physicians - was damaging to me."
"Peer support was the most helpful element."
"In an active cardiac anesthesia practice it would be a little difficult to take time off every time a patient died in the OR or ICU!"
"I am fully in favor of mandatory time off, as subsequent patients may be put at risk if the physician is transiently impaired."
"I think mandatory debriefing and time off may be appropriate in some situations - just not the ones I have been involved with."
"Support [including debriefing] should be available for catastrophic unexpected events, which I would think would be a standard."
"The team approach, with Risk Management, to notification family of terrible news [is best] and will alleviate a lot of angst, second-guessing, and feeling guilty for whatever reason."
"There are a tremendous array of bad experiences to be had …I don't think one size fits all in terms of how to handle these."
"Some deaths are expected/unavoidable. These cases do not warrant a mandatory debriefing."
"We as a profession need to understand that we are human beings."
"As a profession we must do much more to help our colleagues."
Questioning the need for support
"Soldier on."
"This bothers me. This is what we do, we should be able to deal with it."
"Bad things happen all the time in medicine; deal with it."

We received 68 free-text comments. Two themes were prominent: 1) Several recounted in paragraphs the details of catastrophic events and the guilt, isolation and blaming that occurred. This indicates the long-lasting impact of these events. Even if a practitioner feels he or she had a quick recovery, the event is remembered with clarity and recalling it brings forth associated emotions. 2) Many acknowledged the therapeutic value of debriefing, but cautioned the application of a standard protocol because events are highly variable and should be assessed for support needed on a case by case basis. A few felt that these events are par for the perioperative course and that we should "soldier on" and unless the event was the result of a major error, the anesthesiologist should be able to "deal with it." (Table 5) Pressing on as suggested, however, may impact the safety of our next "customer," the patient (Stiegler, 2015).

This study has several limitations. First, we received a low response rate. Because the survey was administered by the American Society of Anesthesiologists on our behalf, we were not in direct control of the email solicitation and reminders. While survey studies often have low response rates, it must be considered that survey methodology can introduce selection bias, meaning that those who chose to participate may not be a representative sample of the general population of anesthesiologists. The motivation for electing to participate might be linked to strong feelings of any kind about aftermath of adverse events. Second, we did not include definitions with our survey, but left it to the clinician to interpret the meaning of "catastrophic event", "debriefing", etc. This was intended to capture the individual experience of participants (and indeed, we did see a broad range of experiences that were all considered catastrophic by the participant), but nonetheless this may have led to heterogeneity among responses.

In summary, anesthesiologists are highly likely to experience one or more catastrophic events in their careers. Across our practice, the support offered is not adequate perhaps because the second victim's needs are not heard or are so poorly understood. The second victim recovery experience is highly individualized and complex, complete with event, person and system factors. A one-size fits all approach is therefore not appropriate when providing support. Models that offer a variety of "menu options" need to be developed and deployed

to those who can benefit from them. This menu can't stand alone, however, but must be offered within the framework of a culture that promotes teamwork and wellbeing in holistic fashion. Toolkits have been developed to assist organizations with implementation (Pratt, Kenney, Scott, & Wu, 2012).

Since our study was conducted, literature describing second victim programs in the U.S. has been published. In 2015, White et al reported results of a survey of risk managers. 74% reported existence of programs to provide second victims with emotional support and 7% reported plans for creating program in the upcoming year (White et al., 2015). In the same year, Krzan et al published a case study describing successful implementation of a second victim program for pharmacy staff a pediatric hospital (Krzan, Merandi, Morvay & Mirtallo, 2015). Although neither addressed the specific concerns or needs of anesthesiology, the increased attention to this matter indicates that healthcare as an institution is heading in the right direction.

Although medical culture has evolved considerably over the past decade or so, clinicians may still be reluctant to activate or request support protocols, for fear of jeopardizing their professional reputations (e.g. appearing "weak"). Similarly, clinicians may be hesitant to accept relief of duty or other support if it is optional instead of automatic (e.g. "Do you need some time off?"). Evidence of this cultural element can be seen in the free-text responses from this survey (Table 6). On the other hand, mandatory relief from duty may unintentionally isolate the clinician from informal peer support and possibly imply a lack of confidence in that individual's resilience.

More robust qualitative and quantitative research is needed to better understand the extent of the problem and the mechanisms for prevention, The implications are broad; data from future studies may help physicians from a variety of high acuity settings. Delineating best practice approaches for minimizing the second victim experience is critical both for a physician's own well-being and for the well-being of their subsequent patients.

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