

REVIEW ARTICLE

What happens when things go wrong?

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Summary

When a patient is injured or dies during anesthesia care, both the family of the patient and the health care providers suffer. The family needs to know what happened. The family can benefit from personal contact with the involved physicians. Apology to the injured is very important. The health care providers must report adverse events. Systematic review of adverse events can provide improved patient safety. Mechanisms exist to support the health care providers recovering from these potentially devastating experiences, but useful support is often not immediately available.

Parents want guarantees that their child will be safe. Parents want to know that the people protecting their child's life are well educated, qualified, empathic, conscientious, enthusiastic, and able to remain focused on the patient at all times in the operating room. Parents want to know that the people protecting their child are not 'high' on drugs, sleep deprived, or taking short cuts. Their last words to us repeatedly are 'take care of my baby'. Pediatric anesthesiologists, many of whom are also parents, want to protect their patients from harm. In most circumstances, there is no noticeable change in the pediatric patient a few days following minor surgery and anesthesia; however, experience shows us this outcome cannot be guaranteed. The wise anesthesiologist acknowledges this preoperatively, although many parents may not choose to discuss their fears and the risks of anesthesia on the day of surgery.

Large, retrospective, and prospective studies document a low incidence of morbidity and even less mortality in healthy children undergoing anesthesia for elective surgery. It is commonly said that the chance of injury during anesthesia is less than that during the car ride to the hospital. But unanticipated bad things have

happened. Minor events, significant injuries, and deaths related to the administration of anesthesia are more common in younger, sicker pediatric patients, and notably in emergency surgeries. (1–7) While the risk in some patients is inherently higher, cardiac arrest has occurred during elective surgery in apparently healthy infants and children. Postoperative neurologic dysfunction may occur for no apparent reason (8). The Institute of Medicine (IOM) reported that up to 98 000 Americans die each year because of medical error (9), a number not often disputed.

What happens to the family of the injured pediatric patient and to the health care providers after such a bad event? Are there predictable behaviors? Are injuries permanent for more people than the patient? What can be done to promote recovery from catastrophic loss for the family of the injured patient and for the health care providers intimately involved?

Broken promises, the mother's narrative

My son was on a stretcher in the hall being wheeled away by the trauma team to the ambulance, after his

cardiac arrest in the operating room. They would not let us ride along. I had broken my promise not to leave him already. My husband's promise that he would be fine was also broken. Our pain and guilt over these broken promises have eased only minimally over the ensuing years. The surgeon walked us to our car in silence. If he said anything, we have no idea what it was. Our world had crashed, and we could not listen to outsiders yet. This may be why physicians often think that parents do not hear what they are saying: because the parents cannot, not because they do not want to, they just are not physically and emotionally capable in that moment. Our other children and family joined us at the hospital upon advice from the chaplain, as there was little life left for our son. Two ministers held our hands and prayed with us in a tiny room. I was heaving over a garbage can, unable to control the turmoil in my stomach. The pain of seeing my child in this condition was unfathomable. I left his room as the team attempted to revive him over and over again. I could not watch. I rocked back and forth while kneeling down outside his room. I remember a group of residents being briefed on the case, and one of them wanting to comfort me, but sadly turning away. I remember his dark hair and eyes looking down at me. Many years later, tears stream down my face, as if this happened yesterday.

Bereaved parents plea for compassionate care

The caring nurses and doctors softened my journey in a way that many other families may never feel. The special physician who achieves this is described in a chapter entitled *Compassionate Care Personified in Putting the CARE in Health Care* (10). For years, some families carry anger, which becomes more intense with each broken promise or unreturned phone call. A gentle hug, a listening ear, a kind word, card, or visit can make a world of difference to the victims in the aftermath of an adverse event.

Families seeking support

Families want honest answers from the physicians involved in their loved one's care. They want to know what went wrong, why it happened, and what is going to be done to prevent it from happening again. These are also the questions asked by root cause analysis (RCA) (11). Most families want an unrehearsed, authentic apology, but for many the apology is not as important as the honest disclosure, which they need. The number one complaint of many families is the difficulty they encountered in obtaining a copy of their

child's medical records. It often takes years for parents to piece together what was done for their child and how things progressed. They may meet roadblocks and excuse every step of the way.

Families react differently to trauma and may have different needs in the aftermath of an injury, depending upon their cultural background. Many patients and families (particularly the parents of children who have died or suffered permanent disability) wonder whether they are in some way to blame for the harm that occurred. The thought that this catastrophe could have been prevented if we, the family, had done something differently may nag parents and siblings for years. Apology from the doctors may provide important confirmation to the family that the health system had more responsibility for the injury than did the patient or the family. By truthfully acknowledging the extent to which the outcome was a result of their actions and/or of broader aspects of the delivery of health care, health practitioners can lift the burden of uncertainty and guilt from the shoulders of the family and provide an understanding of how and why things went wrong (12).

Types of outcomes

Those who study patient safety distinguish between bad outcomes and adverse events. An adverse event is defined as an injury that was caused by medical, including surgical, management rather than the patient's underlying disease. Medical errors are defined as the failure of a planned action to be completed as intended or the use of the wrong plan to achieve an aim. A near miss is defined as an error that could have caused harm but did not, either by chance or by timely intervention (see Table 1) (13). Each of these types of events may have different consequences for the patient, the doctors and nurses, and the health care system. A

Table 1 Definitions of events

Adverse event: An injury that was caused by medical or surgical management rather than the patient's underlying disease
Medical error: The failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Medical errors include serious errors, minor errors, and near misses.
Serious error: Error that causes permanent injury or transient but potentially life-threatening harm.
Minor error: Error that causes harm that is neither permanent nor potentially life-threatening.
Near miss: An error that could have caused harm but did not, either by chance or by timely intervention.

Table first published in *Archives of Internal Medicine*, August 14, 1966: 1585–1593. Copyright © 2006 American Medical Association.

patient may die although all treatment plans were appropriate and executed correctly. In that case, there is no adverse event, but the involved health care providers may still feel a catastrophic loss.

Responses to catastrophic loss

The responses of humans to catastrophic loss have common elements under many circumstances. For example, when challenged by catastrophe, denial is often the first response. In 1969, Kubler-Ross (14) described five stages of grief: denial, anger, bargaining, depression, and acceptance. This sequence of emotional and cognitive processes was first described in the context of an individual confronted with the knowledge that their own death was expected in the relatively near future. The same process may be experienced in the face of any catastrophic losses such as loss of a close relative, loss of a limb, injury that produces loss of livelihood, loss of homestead, and loss of a major competition; all of these losses have been followed by grief in stages similar to those described by Kubler-Ross. The patient and their family are likely to experience grief in this way. A similar sequence of responses has been presented to describe what anesthesiologists may experience after injurious anesthetic events (15).

A physician who loses a patient during an anesthetic may experience the death as a personal catastrophic loss (16). To claim such is not to diminish the grief of the parents, siblings, and extended family of the deceased. The loss to the failed health care provider is the loss of faith in the years of extended days invested in clinical training. If all the studying, all the examinations, all the residency years, and years of clinical practice, thereafter, are not enough to guarantee safety to patients, how can the health care provider go forward to offer safe care to the next patient? The young physician, recent graduate (16), resident, or medical student may be particularly vulnerable to lingering doubt about their own ability and commitment to training and practice. The response of their teachers and the wider community may be critical to their future work.

The health care providers

Historically, pediatric anesthesiologists are among the most compulsive physicians. Each day they face the narrow tolerance of their often diminutive patients for anesthetic drugs and fluid management, as well as greater technical difficulties with airway management, precise pharmacological titration, and vascular access. Because pharmacologic and physiologic problems and errors can be frequent in the practice of pediatric anes-

thesia, a large part of the work of the pediatric anesthesiologist is to detect these problems and intervene before the patient is harmed. When surgery is concluded and the pediatric patient recovers comfortably from anesthesia, the anesthesia and operative teams are rewarded for their diligence, often with a smile and a 'thank you' from the family. If the child is injured during the course of an anesthetic, or recovers in severe pain, the team has failed. Patients and families then expect and deserve proper disclosure and follow-up to promote the best possible outcome.

One might imagine that the consequences of failure in the conduct of duty would differ with the severity of the outcome. In some respects, this is true. In particular, when no harm comes to the patient, the family may not learn of the error. However, there are common elements in the response of health care providers to small errors and to catastrophic patient injuries.

The health care provider may feel that an adverse event has occurred when the patient fails to be helped by the treatment provided or when the patient dies, because the outcome of treatment was not consistent with the physicians' goals. This is particularly dramatic in the case of the pediatric victim of a motor vehicle collision or some other type of trauma. The causes of such a tragedy are often multifactorial. Review of the event by unbiased peers may determine that nothing could have been done differently or that some processes in the delivery of care and/or the performance of one or more health care providers contributed to this outcome. Although the actions needed to work toward never experiencing this terrible event again are quite different depending on which of these potential causes in fact contributed to the patient's injury, the emotions of those involved can be similar, despite the causes of the event. To support recovery and progress, review should be as rapid as possible and the conclusions communicated to all involved, but the analysis should also be thorough and discuss latent errors (17).

Failure to keep the patient from harm may have many causes. Denial that harm could have resulted from one person's action or inaction may protect the ego of that health care provider, but it is not helpful to the patient, their family, other health care providers involved, or the health care system. In some practice environments, formal requirements have been established at the departmental, hospital, and local government levels to require reporting and analysis of bad outcomes and adverse events. For example as of 2007, mandatory systems for reporting adverse events had been established in 25 states and the District of Columbia in the United States of America (USA) (18). This was in response to the IOM call for nationwide

mandatory reporting (9). In many hospitals in the USA, reporting procedures have been revised frequently in the past 10 years motivated by the Center for Medical Services (CMS) or the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

Disclosure standards

In 2001, the first nationwide disclosure standard was issued by JCAHO (19) in the USA. JCAHO recommended that all patients, and their families when appropriate, be informed about any outcomes of treatments or procedures that differed significantly from what was anticipated. It has been claimed by many that there is a consensus that physicians are obligated to disclose adverse events to their patients (20). Since then, in some states in the USA, notably by Act 13 in Pennsylvania, it has been required that the health care provider report any adverse event with or without associated injury, or any event that required unexpected escalation of therapy, as soon as possible. Denial of personal involvement is a brief transitory response, because bargaining with this system of reporting is not an option.

After reporting the event, assessment may be made by a designated service in that hospital, in some cases the Office of Risk Management, within a short period of time. Input from all parties involved contributes to a timeline of the adverse event. The established officers and committees charged with advancing patient safety review the event. The existing checks and balances, policies and procedures, hospital standards, supplies, and response times, including appropriateness of personnel, are reviewed with respect to the potential relationship to the adverse event. Recommendations are made with a timeline for action. RCA, the review process performed to identify causal factors underlying the occurrence of sentinel events, focuses on systems and processes more than on individual performance. Although the components of a RCA may vary, action plans are usually formulated, but there must be follow-up to be sure that beneficial change has occurred (11).

It is usually the role of the attending physician to disclose unexpected outcomes, including adverse events, to the patient and family or guardian. In the case of events related to anesthesia, the most relevant physician is the attending anesthesiologist. It has been proposed that when there is legitimate uncertainty about the contribution of an error to an unexpected outcome, the individual physician should not be solely responsible for decisions about disclosure to the injured patient and family (21).

Despite the hospitals' obvious interest in the appropriate handling of disclosure of adverse events,

many physicians find themselves without support prior to sitting down with families to discuss events. The physicians may feel the inherent inclination to comfort the family and the fear of making a bad situation worse by offering information conflicting with the reports from other health care providers, or hospital administration, with consideration of the possible legal ramifications. Where litigation is likely, whether the event occurred by chance or by physician, nursing, or medication error, a career that minutes prior to the event felt secure and fulfilling may suddenly feel precarious, inadequate, and filled with self-doubt, a situation that is often overwhelming. This alteration in perception may play a substantial role in the conversation the health care provider does or does not have with the family. The responses of physicians to standardized scenarios suggest that there is great variability in what physicians choose to say to their patients after an adverse event (13,22). Providing training and emotional support to physicians regarding disclosure of adverse events to patients and their families could reduce mistakes such as not disclosing enough information, disclosing too much, and disclosing incorrect information (23).

Health care providers may fear that an apology would have adverse legal consequences. There are laws that may ameliorate such fears (24). However, the protection provided by apology laws differs from one state to another in the USA and is often not complete (25,26). Some private malpractice contracts suggest that disclosing an error to a patient in a way that admits legal liability could void malpractice coverage (23).

Moving forward

Adverse events are a driving force of reform in medicine. A brief inspection of the literature unveils a mountain of guidelines, consensus statements, and studies highlighting the incidence of various events and measures recommended to reduce the possibility of these events occurring again. The primary focus of these investigations is to improve the quality of care given to patients and thus decrease the possibility that there will be future victims of similar adverse events. This is clearly what patients, physicians, and the health care systems need. While not denying that the patient is of singular importance in these situations, there is a troubling lack of guidance and information regarding the second victim present in each one of these events, the responsible physician(s).

Physicians involved in medical errors may be the object of anger and scorn by their colleagues. They may be angry at themselves for the problems that they

now face. They may be isolated by silence. Review of 32 empirical studies published between 1980 and 2007 in English, German, or French noted that common reactions reported by health care providers involved in errors included distress, self-doubt, confusion, fear, remorse, guilt, feelings of failure, depression, anger, shame, and inadequacy (27). These elements of grief may persist for a long time in the health care provider (28). The more that the physician perceives the patient's injury as a direct result of their action and the worse the injury, the greater the emotional reaction of the physician (29).

There is little published about recovery plans and coping strategies needed following a physician's involvement in a case with a bad outcome. But there are personal accounts that often amount to cries for help. For example, Dr. Gawande reflected on mistakes made during his residency that led to the loss of a patient's airway and near death. He, like many physicians in his situation, 'felt a sense of shame like a burning ulcer.' Gawande proposed that he did not simply cause a problem but that he himself was the problem (30). He noted that 'it is one thing to be aware of one's limitations. It is another to be plagued by self-doubt.'

Looking at a typical hospital protocol implemented after an adverse event, it is easy to understand Gawande's personal struggle after nearly losing his patient. The language of these documents clearly lays out plans to investigate the events, inform the families of the events, and ensure that the events do not occur again in the future. The physician is given precise instruction regarding reporting and disclosure and is promised a thorough, likely stressful review by their peers. Hidden in the document, there may be a paragraph offering the physician involved support, as deemed necessary, often overshadowed by multiple statements of rebuke. The means of support is vague and, without clear language and processes, often forgotten.

One of the most comprehensive documents addressing useful responses to adverse events was released from Harvard in 2006. Among its goals, the statement confronted the lack of guidance for physicians. A number of steps were proposed including the formation by the hospital of a program specifically designed for the needs of involved physicians, flexibility in physicians' schedule following an adverse event, clear debriefing and documentation, assistance communicating with the patients' families, and instruction for physicians regarding peer review (31). While details of each recommendation were left open, hospitals can use this framework to build a recovery program that will meet the needs of physicians following an adverse event. There are independent programs such as the

Schwartz Center (<http://www.theschwartzcenter.org>), developed to promote compassionate health care that gives hope to patients and support to families and health care providers. Such support includes addressing the recovery of health care providers after their experience of serious adverse events. Medically Induced Trauma Support Services (MITSS) (http://www.mitss.org/MITSS_WhatsMissing.pdf) is immediately available for urgent questions. Clearly, some events require special accommodations. After a healthy young man experienced an MH episode intra-operatively and died postoperatively, not only the anesthesiologist, but also many of the operating room, and ICU staff were unable to return to work without counseling (32). To have failed to rescue such a patient is a very difficult burden for the anesthesiologist. But there are medical conditions that at some point are beyond the ability of the anesthesiologist and all associated health care providers to treat and reverse.

It may be only circumstance that places one particular individual physician rather than another, in the position of responsibility for the patient's significant injury or death. The individual with moral luck (33,34) has behaved no differently than the individual who contributed to the catastrophic loss, but the lucky person was not in the situation where injury occurred. Anesthesiologists often undertake interventions with the intention of helping the patient, but unintentionally harm that was foreseeable may occur. The anesthesiologist has no recourse or capability to dissociate from the risks of the surgical event or from unintended, unforeseeable results of anesthetic. The ethical dilemma of this double effect was originally described by Thomas Aquinas (35). The intention of the actor is important to the ethical value of the act. A mistake is the unintended consequence of an intended action. An accident occurs without intent. These distinctions are important for the intellectual understanding of the ethics of injurious events. Understanding should motivate support for the individuals caught up in morally unlucky circumstances.

Job stress and emotional pressures are known entities that lead physicians away from successful careers (36). One study found physicians involved in medical error had their performance negatively impacted by the anxiety of committing other errors, loss of confidence, disruptive sleep, reduced job satisfaction, and weakened reputations (27,37). This reaction is similar to that seen in post-traumatic stress disorders. With the amount of effort put toward investigation and prevention following an adverse event, it is inappropriate that programs to support the recovery of health care providers from these events are not widely implemented.

Table 2 BICEPS – Management of the reaction of professionals to stress in work

Brevity: Dealing with the stressor will be brief and focused
Immediacy: Feelings of grief and/or guilt should be confronted soon after the traumatic event or as soon as symptoms are recognized.
Centrality: Discussions should take place with all affected health care staff in a central location in an organized fashion.
Expectancy: It should be clear that the expectation will be that affected individuals will be returned to work and that a means of returning to normal productivity should be outlined (for instance, increasing supervision or decreasing patient acuity).
Proximity: Discussions and treatment should take place near the work place to maintain friendships and bonding. Sending a worker home for a week can increase feelings of guilt and alienation.
Simplicity: Discuss and treat only the current problem. Avoid medications or complicated recovery regimens.

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Counseling physicians through these pitfalls would inevitably bolster their confidence and ability to work appropriately.

It has been suggested (38) that the approach to responding to stressful events used by the military, BICEPS, should be incorporated into anesthesiology training. The acronym, BICEPS, outlines a method for supporting the involved physicians and nurses, which is consistent with current hospital policies (see Table 2) (39). The position of the physician anesthesiologist differs from that of the soldier in that the physician is not immediately at risk of loss of life or limb, but both may see death unexpectedly and experience grief, sleep deprivation, and guilt.

Moving beyond the immediate response, the Institute for Healthcare Improvement (IHI) has published a plan of proactive preparation for management of serious clinical adverse events as well as describing an overall approach and providing tools to direct the reactive emergency response of an organization that has no prospective plan (<http://www.ihf.org>, accessed 11/05/2010). IHI emphasizes that it is the responsibility of the executive officers of the organization to establish

and maintain a work culture that supports improvements in patient safety. Furthermore, leadership must be involved in the response to adverse events. It is proposed that a Crisis Management Team be established to act in specific ways to optimize response to adverse events at any time. An organization, hospital or health care system, may have high levels of quality care and safety practices, but no plan for clinical crisis management. The plan for crisis management has to be practiced, fine-tuned, and accessible to patients and their families, as well as to the health care providers. The 2010 document from IHI addresses many of the concerns of patients, families, and health care providers following adverse events. IHI goes beyond that to address mechanisms by which health care organizations can prospectively prevent adverse events and decrease the negative impact of adverse events when they do occur.

Community support is an important part of grieving. Participation in comforting rituals and expression of emotion are part of recovery from catastrophic loss. (<http://www.ekrfoundation.org/about-grief>). A wake is a ceremony for the community of the deceased that provides the family with support in their grief. Maintenance of a healthy lifestyle with appropriate eating, exercise, and rest is necessary for recovery. Individual psychotherapy and writing about the events may be beneficial. This is relevant to the injured patient, the grieving family, and the involved health care providers. The course of recovery from a bad event can be long. Ideally, forgiveness supports continuation of life with relatively normal function, in the presence of the memories of our serious losses.

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