

Complications: acknowledging, managing, and coping with human error

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Abstract: Errors are inherent in medicine due to the imperfectness of human nature. Health care providers may have a difficult time accepting their fallibility, acknowledging mistakes, and disclosing errors. Fear of litigation, shame, blame, and concern about reputation are just some of the barriers preventing physicians from being more candid with their patients, despite the supporting body of evidence that patients cite poor communication and lack of transparency as primary drivers to file a lawsuit in the wake of a medical complication. Proper error disclosure includes a timely explanation of what happened, who was involved, why the error occurred, and how it will be prevented in the future. Medical mistakes afford the opportunity for individuals and institutions to be candid about their weaknesses while improving patient care processes. When a physician takes the Hippocratic Oath they take on a tremendous sense of responsibility for the care of their patients, and often bear the burden of their mistakes in isolation. Physicians may struggle with guilt, shame, and a crisis of confidence, which may thwart efforts to identify areas for improvement that can lead to meaningful change. Coping strategies for providers include discussing the event with others, seeking professional counseling, and implementing quality improvement projects. Physicians and health care organizations need to find adaptive ways to deal with complications that will benefit patients, providers, and their institutions.

Keywords: Complication; medical error; coping; physician burnout

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Introduction

To err is part of the human experience—an existence marred by miscalculation and misjudgments. Errors infiltrate every aspect of our existence, including our professional lives. Imperfections in law or academia may be inconsequential or remedied with an apology, while other occupations may not be so forgiving. Physicians, like pilots, carry a greater burden as their errors can be catastrophic. A review of the literature regarding in-hospital adverse events estimates an incidence of nearly 1 of 10 patients experiencing an

adverse event, the majority of which are surgery-related, and 7.4% of which are lethal (1). Since the Institute of Medicine's report in 1999 citing 44,000 to 98,000 deaths annually (2) from medical errors, more recent estimates place the incidence as high as 400,000 deaths a year (3,4) with at least 43 million adverse events yearly worldwide (5), making medical errors the third leading cause of death after heart disease and cancer (6). While not all errors are life-threatening, they can significantly compromise a patient's quality of life. Errors in medical care can have lasting emotional and physical consequences for patients, their

families, and health care providers.

Definitions

Expert psychologist James Reason described two kinds of errors (7): an error of execution where the correct action does not produce the intended consequence, or an error of planning in which the original intended action was not correct. The Institute of Medicine differentiates between an adverse event, medical error, and a near miss (8). An adverse event is an injury caused by the treatment process rather than the patient's underlying disease process—this is contrast to a complication, which is an unfavorable consequence of the patient's disease process. A medical error results from an error of execution or error of planning, as previously described (7). Medical errors include serious errors, minor errors, and near misses (8). A patient who experiences a serious error sustains permanent or transient but potentially life threatening harm. Minor errors also cause harm, but it is neither permanent nor life threatening. Finally, a near miss is an error with the potential to cause harm but did not occur either due to chance or timely intervention.

Acknowledging complications

A physician's initial reaction to an adverse event is often shock or denial, particularly when the complication is sudden and unexpected. Disclosing that a medical error has occurred is a moral obligation, vital to the patient-physician relationship, and essential to the patient's and physician's emotional well-being, yet may be challenging even for the seasoned professional (9,10). In a highly-publicized article titled "*Facing our mistakes*", family physician David Hilfiker, candidly recounts his personal experience with medical errors and the ubiquitous quest for perfection in medicine:

"The drastic consequences of our mistakes, the repeated opportunities to make them, the uncertainty about our own culpability when results are poor, and the medical and societal denial that mistakes must happen all result in an intolerable paradox for the physician." (11)

This paradox stems from a physician's sense of duty—borne from the Hippocratic Oath's "first, do no harm," which unintentionally places an unbearable burden on the shoulders of physicians by leading them to believe that errors are altogether forbidden (12,13). Importantly, however, our duty as physicians belongs to our patients who entrust us with their care.

Evidence suggests there is a gap between what physicians intend to disclose to patients, and what actually occurs in practice after an adverse event occurs (14-18). Kaldjian *et al.* surveyed faculty and residents at four medical centers in the United States demonstrating that although 93% of physician responded that they would disclose a major error to a patient, only 5% reported actually disclosing a major error in practice (18). The likelihood of error disclosure may also be dependent on the physician's specialty. In a study by Gallagher *et al.*, despite surgeons reporting a greater intention to disclose a medical error than their medical specialist colleagues, surgeons reported divulging less information and were less likely to use the word "error" in the disclosure process (8). Physicians may falsely believe that "*what they (patients) don't know can't hurt them*", which is evidenced by the fact that physicians appear less likely to disclose an error that is not readily apparent to patients (8,19). Upon recognition that a medical error has occurred, physicians should proceed with disclosure in a systematic and timely manner. Physicians can approach disclosure with the basic problem-solving strategy of what, who, when, why, and how.

What

Studies indicate that patients want full disclosure regarding adverse events, beginning with an explicit statement that an error has occurred, and the details of what occurred (20-24). Patients prefer that their physician provide this information upfront, rather than having to ask their physician numerous questions (23). In a study using standardized patients, only 57% of surgeons used the word error or mistake when making a disclosure (25). A surgeon's reluctance to use the word error may falsely lead the patient to believe that the event was an unpreventable complication of the procedure. This hesitancy to admit to a medical error or offer sympathy may stem from a fear that it will make the physician vulnerable to malpractice liability, despite the fact that patients appreciate honesty with disclosure (26-29). In fact, evidence suggests that only about 12% of injuries due to negligence lead to litigation in the United States (21,30).

Failure to communicate honestly and clearly may leave patients feeling angry and deceived, making them more likely to file a malpractice claim (31-33). Physicians should keep this in mind during the disclosure process because a "choosing your words carefully" approach may alienate patients, and leave them with the false impression that the physician is not remorseful about what happened or

is trying to hide information. A review of 45 plaintiffs' depositions identified the following most commonly cited reasons for filing a lawsuit: physician's failure to be available (31.5%), devaluing the patient's or family's views (28.9%), dysfunctional communication (26.4%), and failure to listen to a patient's request for information or expression of discomfort (13.1%) (34).

Proper error disclosure should include an explanation of what happened, how it happened (11,22,23,35-38), and future implications for the patient's health (22,23). Discussing the factual details surrounding an adverse event may come more naturally than providing a sincere apology, which is also a necessary component of the resolution process (23,39,40). Failure to apologize may lead to loss of the patient's trust in their physician and further strain the relationship (23,41-43). An apology is a powerful communication tool to convey that the physician acknowledges the patient's suffering and accepts responsibility. It should not be confused with regret, which conveys sympathy without accepting responsibility (43).

Who

The disclosure process should include an account of who was involved in the event. This includes whether it was an isolated mistake made by the physician, a member of the staff, a trainee, or a hospital-wide systems problem. A survey of internal medicine patients shows that when a mistake occurs, most patients prefer to discuss the matter further with their physician, while the number desiring to speak to another physician rose with increasing severity of a mistake (21). After the initial disclosure process it may be appropriate to offer the patient a referral to another physician for a second opinion, particularly when additional procedures or treatments are indicated.

In the event that the adverse event was caused by a trainee, both the supervising physician and trainee should be present to take responsibility, discuss the event, and answer any questions the patient may have (44). Presence of the supervising physician is paramount considering one-third of residents believe they are unprepared to disclose a medical error to a patient (45), and only one-third have received formal training on how to do so (46). It also gives the supervising physician the opportunity to teach proper error disclosure, which may be more effective than even a formal teaching session (46,47). In some situations, it may also be prudent to involve the hospital's patient safety and risk management departments to provide guidance (48).

Finally, consider who should be present at the time of disclosure. Depending on the patient's support network, it may be beneficial to have family members or a support person present during the disclosure conversation. This may offer the patient much needed emotional support during a difficult time, provide a second set of ears to listen to the discussion, and potentially reduce misinformation by consolidating the conversation.

When

Experts advocate that the initial disclosure discussion with the patient and their support person should occur as soon as possible after recognition of the adverse event (16,37,49,50). A delay in disclosure breeds uncertainty and evokes anxiety for the patient, support person(s), and their health care team. Although patients want to be informed about an error promptly, they understand that it may take time to collect details regarding what caused the error and how to prevent it (23). Clinicians should be prepared to update the patient and their support team as new information becomes available, keeping in mind that disclosure is a process rather than an event (51). Although the initial disclosure may take place in the acute hospital setting, future discussions may continue in the outpatient setting. Keeping the lines of communication open between physician and patient prevents the patient from feeling alienated or abandoned after an adverse event.

Why

It is human nature to desire to want to understand the circumstances that led to an adverse event whether it was a technical error, lapse in judgement, equipment failure, or deficiency of knowledge. Clinicians should provide a clear explanation while avoiding ambiguous and confusing language. Research shows that less than half of physicians provide complete details of what happened, an apology, and explanation for how the error will be prevented in the future (8,52). Neale *et al.* reviewed 100 successive legal claims, determining that 37% of claims were due to either the patient's inability to accept or understand the natural course of their disease process (53), emphasizing the importance of sharing medical knowledge before and after an adverse event.

Physicians should be aware that patients may choose to define patient safety incidents more broadly than health care providers, including unsatisfactory service quality, poor

interpersonal skills, and non-preventable adverse events (23,24). Patients are most likely to report medication errors (17%), nursing mistakes (15%), medical equipment errors (10%) and misdiagnosis (10%) as errors regarding their care (24). They are most likely to ascribe such errors to provider stress or fatigue, communication failure, or understaffing (54). In addition, physicians attribute poor teamwork, insufficient continuity of care, inadequate supervision, errors with handovers, systems failures, and deficient knowledge or skill as patient safety concerns (15,55-58).

How

The assurance that something is being done to prevent a similar adverse event from occurring in the future is important to patients (23). Health care professionals should strive to identify what errors were made, how they could have been prevented, and what changes can be implemented to prevent them from happening in the future. Physicians need not have all the details of how they will translate an adverse event into a quality improvement opportunity during the acute event, but should reassure the patient harmed that steps will be taken to prevent this from happening again. Health care professionals should understand that many patients report filing malpractice suits to prevent adverse events from happening again (31-33), and that discussing error prevention with patients can make the conversation more positive and less threatening to physicians. Involving patients in the error prevention process can also provide valuable insight for patient safety programs and future error reduction.

The Michigan model

The traditional deny-and-defend model that once dominated health care litigation operates under the assumption that a conflict is inevitable when a patient is victim of an adverse event, and that the most practical way to respond to the patient's complaint is to be antagonistic. As a result of this stonewalling, patients may come to false conclusions and attempt to fill in the gaps to make sense of what happened without the benefit of any medical knowledge. This yearning to discover the truth is one of the main reasons patients instinctively hire a lawyer (33). Realizing that deny-and-defend was costly, taxing on resources, and a barrier to patient safety, the University of Michigan Health System transitioned from a deny-and-

defend approach to an "open disclosure and offer" model in the early 2000's. It was built on the following three foundational principles:

- (I) Patients should be compensated quickly and equitably if they received unreasonable medical care;
- (II) If the care delivered was reasonable or did not negatively affect the clinical outcome, caregivers and the institution should be given full support;
- (III) The institution should learn from adverse patient safety events to reduce patient injuries, and thereby legal claims (59).

At the heart of the Michigan model are the principles of accountability, honesty, and consistency. Rather than view an adverse event as a threat, the institution views it as an obligation that has to be met, and an opportunity for quality improvement. It gives health care providers the opportunity to seize control over the dialogue after a medical error rather than the former practice of deferring to lawyers. Honesty is a necessary premise when determining whether or not a patient received unreasonable care. Boothman *et al.* argued that "the first disclosure is always the one we make to ourselves", without which claim gains and patient safety improvements are not possible. Defending true medical errors is a waste of financial resources, inhibits health care improvement initiatives, and undermines the development of an institution's culture of safety. Lastly, consistency means adhering to central principles such that behavior, processes, and operations are predictable within an organization.

In 2010, Kachalia *et al.* reported on the changes in liability claims and costs with implementation of the University of Michigan's error disclosure program (60). The rate of claims that resulted in a lawsuit decreased from 38.7 to 17.0 per year after program implementation. Median time to claim resolution decreased from 1.36 to 0.95 year, while the rate of resolution increased after program implementation. Similarly, median and mean total liability costs decreased (RR for mean costs, 0.41, $P < 0.001$) due to both legal and patient compensation costs. The average cost per lawsuit also decreased from \$405,921 to \$228,308 (RR, 0.40; $P = 0.001$) with full program implementation. The authors concluded that of their open-disclosure policy was beneficial to both patients and the institution by resolving medical errors quickly and fairly.

The Agency for Healthcare Research and Quality subsequently developed the Communication and Optimal Resolution (CANDOR) in 2016 (61), based on the Michigan model. CANDOR is a deliberate claims management strategy that focuses on honesty, transparency,

and accountability. It has been tested and applied in 14 hospitals across 3 hospital systems. Online modules are available for organizations interested in implementing a medical error resolution process (61).

The effect of medical errors on health care professionals

Once thought of as infallible and unemotional, physicians and the public now recognize that doctors are as human as the patients they care for. The mid-1980's was marked by a series of publications in the medical literature that portrayed personal accounts of physicians conveying feelings of guilt, shame, and inadequacy after a medical error (11,15,62-64). This paved the way for acknowledging the internal struggle physicians face, leading internist Dr. Albert Wu to coin the term "second victim" in an editorial published in 2000. Scott *et al.* went on to provide a more detailed definition as follows (65):

"Second victims are healthcare providers who are involved in an unanticipated adverse patient event, in a medical error and/or a patient related injury and become victimized in the sense that the provider is traumatized by the event. Frequently, these individuals feel personally responsible for the patient outcome. Many feel as though they have failed the patient, second guessing their clinical skills and knowledge base."

As clinicians we feel a sense of duty to our patients and honor to our profession. We have all felt the sinking feeling when we realize that we have made a mistake while caring for a patient. Instinctively we look to see who has noticed because we fear the accompanying shame or punishment. We wrestle with the information, who to tell, and what to say. In an effort to make sense of what happened we may replay the events in our mind, what we could have done differently, and how it may have changed the outcome. The thought of confessing breeds fear of punishment and uncertainty about how the patient will react. These negative feelings may leave us feeling anxious, isolated and insecure.

Emotional effect of complications on physicians

In addition to its direct emotional effect, complications can negatively impact a physician's performance; Patel *et al.* reported that 12.2% of surgeons felt it impaired their ability to perform their job, and 2% even avoided certain procedures as a result (66). Survey participants who were negatively affected by a complication reported difficulty concentrating, declining clinical judgment, loss

of confidence, trouble sleeping, and difficulty enjoying leisurely activities and daily life—symptoms that overlap with clinical signs of depression (67). A review of the literature shows other frequently reported symptoms include frustration, embarrassment, anger, blame, worry about reputation, and reduced job satisfaction (13,68-72). Pinto *et al.* described the association between complications and acute traumatic stress, likening it to post-traumatic stress disorder (73). They determined that general surgeons were more likely to display symptoms of acute traumatic stress than their vascular surgery counterparts, hypothesizing that general surgeons may be less accustomed to lifethreatening complications or a complication in a low-risk patient takes a higher toll than if the patient were high-risk (69). According to survey results from Shanafelt *et al.*, surgeons may be more sensitive to burnout than their nonsurgeon colleagues as they were less likely to report that they would become a surgeon again and less likely to recommend their children pursue a career in surgery (74).

Physician burnout and medical errors also appear to be intimately associated, although direct causation is more difficult to establish (75,76). Both patients and physicians attribute stress, fatigue, and exhaustion to leading to medical errors (54,77). Fahrenkopf *et al.* established a relationship between depression and medical errors in pediatric residents when they determined that residents suffering from depression were six times more likely than their nondepressed colleagues to make a medication error (76). Further, depressed residents were more likely to report being in poor health, working in impaired conditions, and difficulty concentrating at work.

Reported coping strategies

In the setting of a medical error, physicians rely on both defensive and constructive coping strategies to deal with the aftermath of a complication (78). Mizrahi *et al.* described the defensive mechanisms of denial, discounting, and distancing (79). The initial instinct to withhold an error is a defensive reflex of denial, while blaming the mistake on work overload or institutional failures is typically an attempt to distance oneself from the error. Wu *et al.* applied Lazarus and Folkman's Ways of Coping Scale to dealing with medical complications, which includes the following coping methods: seeking social support, accepting responsibility, distancing, emotional self-control, escape avoidance, and planful problem solving (80,81).

In a qualitative study by Scott *et al.*, researchers interviewed

health care providers regarding their personal experiences, coping mechanisms, and recovery trajectory after an adverse event (65). Despite their different experiences and coping strategies, participants consistently described a similar six stage recovery process: (I) chaos and accident response; (II) intrusive reflections; (III) restoring personal integrity; (IV) enduring the inquisition; (V) obtaining emotional first aid; and (VI) moving on. They proposed that the culmination of their proposed recovery pathway, the “moving on” stage, leads to either dropping out, surviving, or thriving. The authors were among the first to characterize the most commonly reported physical and psychosocial symptoms reported by clinicians in the wake of an adverse event.

Using the framework created by Scott *et al.*, Luu *et al.* interviewed surgeons to explore their personal recollections of adverse events. Researchers identified four phases of progression after an adverse event: the kick, the fall, the recovery, and the long-term impact (64,82). The initial stage, the kick, was characterized by a visceral response of tachycardia, anxiety, and self-deprecation. This was followed by the fall, which surgeons described as a black cloud that affected their emotional well-being, as well as their personal and professional lives. Surgeons endorsed that the impact of the adverse event was typically greater if a direct link between the surgeon and the adverse event could be established. Discussing the complication with others was a common theme during the recovery phase. For many, it was easier to discuss the details of the case, rather than the emotional impact it had on them, particularly when discussing it with their colleagues. The final phase, the long-term impact, left a positive or negative impression on the physician depending on how they viewed the adverse event, and in some instances resulted in a change in the scope of their practice. The authors were quick to point out the dichotomy of a profession that demands perfection, while embracing transparency in error disclosure.

Physicians who are able to recognize when they have made a mistake can analyze it intellectually and pursue a problem-focused strategy that may lead to personal or systemic refinements (83). A change in clinical practice is a constructive coping strategy that if formulated quickly, can be incorporated into a disclosure conversation with the patient and their family (15,84,85). Pinto *et al.* interviewed 27 surgeons regarding their experience with complications and found that more than two-thirds admitted that a serious complication had an impact on their clinical practice, with most reporting a tendency to become more conservative

and risk-averse (69). Surgeons' reactions were related to whether the complications were unexpected or preventable, surgeon personality, surgeon experience, severity of outcome, patient's reaction, and institutional factors. While surgeon experience may influence a physician's response to a complication, the majority of surgeons report that their ability to handle the emotional effects of complications does not improve with time (66), and the likelihood of error disclosure decreases 15% with each decade of age of the surgeon (74).

Most health care providers believe that talking about the incident with someone else is beneficial, typically a trusted senior colleague or significant other (68,69,86,87). Physicians may turn to a colleague for solace or advice after a medical error, because a colleague is uniquely positioned to provide personal validation, reassurance, and professional affirmation. Such discussions with colleagues may be beneficial unless the individual attempts to minimize the mistake in an effort to avoid emotional concern (70). Meeting with the patient who was harmed can also combat some of the negative feelings associated with the event (86,88), although it may not be as effective a coping mechanism as discussing the event with medical colleagues (87). Physicians may also benefit from seeking professional help to deal with a complication (86), although only a minority of physicians report doing so (66).

Some gender differences exist in regards to handling complications. Female surgeons are more likely to attribute their emotional reaction to an adverse event to their gender (64). Women physicians are less likely than their male counterparts to rely on a coping strategy, which may place them at higher risk for burnout, depression, and substance abuse (68,89). This is also true of physicians who lack a healthy coping mechanism, which can lead to dysfunctional ways to deal with stressors including alcohol and drugs (90). Evidence suggests that women physicians are more likely to experience a crisis of confidence, fear being blamed, and suffer a greater loss of reputation (91). Younger physicians and physicians who work longer hours also appear to be more susceptible to burnout (74,92), while physicians who have a colleague mentor, exercise, participate in hobbies, and drink minimal amounts of alcohol are less likely to experience burnout (93).

Additional suggestions for coping with complications

The final stage in the recovery process proposed by Scott

et al. is a defining moment in which the physician can either drop out, survive, or thrive (65). Arming providers with effective coping tools increases the likelihood of achieving the latter. As institutions evolve from a reactionary to preventative approach when dealing with complications, they need to adopt strategies aimed at facilitating communication among patients, providers, and administration. Physicians, particularly trainees would benefit from formal training and a mentoring system to address dealing with complications. Providing health care employees support at the organizational level during such an emotionally distressing time is mutually beneficial to both the providers involved and the institution. Employees may benefit from time off from work and confidential psychological services, which may encourage physicians to seek counseling. Establishing a formal disclosure system may also facilitate improved communication between patients and providers, while creating a reproducible process that can be iteratively improved. Lastly, a word about the effect of the culture of medicine on a provider's experience with complications, an area in which the literature is significantly lacking. We would encourage providers to not fall victim to the negative emotions that seem inevitable in the midst of a complication, as it may affect their ability to assess, manage, and recover from the situation. Instead, we need to better understand the aspects of the culture of medicine that contribute to the feeling of fear for reputation and shame, otherwise we will be unable to make advances in the field as individuals, institutions, and as a profession.

Conclusions

Mistakes are ubiquitous in medicine, yet providers are often unprepared to deal with the aftermath of a medical error. Counterintuitively, physicians may shy away from transparency for fear of litigation and blame, despite evidence that patients cite poor communication and lack of transparency as primary drivers to file a lawsuit in the wake of a medical complication. Health care organizations such as the University of Michigan have demonstrated that an open disclosure policy can be successfully employed to improve patient satisfaction, facilitate patient-physician communication, and reduce medical liability. While institutions struggle to adapt to the shifting landscape of error disclosure, providers at fault must learn to cope with the emotional toll. Coping strategies include discussing the event with colleagues, formal training or mentorship, and confidential psychological therapy. Institutions should

strive to develop a formal error disclosure policy to benefit patients, providers, and their organization.

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Footnote

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