DISCLOSING MEDICAL ERROR: A PROFESSIONAL STANDARD

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The landmark report by the Institute of Medicine (IOM), *To Err is Human*, revealed the high prevalence of medical errors in the U.S. health care system and focused the attention of private and professional organizations, government agencies, and the public on the need to improve patient safety [1]. Extrapolating data from several large national studies, the IOM concluded that medical errors account for at least 44,000 and perhaps as many as 98,000 deaths in U.S. hospitals each year, with a total estimated annual cost between $17 and $29 billion [1]. Although the figures reported by the IOM have been debated [2], it is clear that too many medical errors occur and that no physician is immune to the impact of these mishaps in clinical practice.

In the wake of the IOM report, health care organizations across the United States have been implementing programs to improve patient safety, with a further impetus provided by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). In July 2001, JCAHO introduced new patient safety standards, including a requirement for hospitals to document staff willingness to report medical errors and to inform patients and, when appropriate, their families about the outcomes of care, including unanticipated outcomes [3]. In an early 2002 survey of a representative sample of U.S. hospitals, 86 of the 245 responding hospitals (36%) reported having a formal policy for disclosing medical errors and another 44% said they were in the process of developing one [4]. However, this survey revealed significant variation in how organizations decide what should be disclosed and how disclosure should be handled.

Although the JCAHO accreditation requirements and individual institutional policies clearly set the professional standard for medical error disclosure, many complex issues remain for the physician who is involved in an error. When an error occurs, events can cascade rapidly. These events may involve interactions among many players, including the patient, family, medical team, professional peers, and risk management and legal departments. A medical error raises ethical, financial, academic, and professional questions for the physician involved, leading to significant stress and confusion about how to respond to best meet the competing demands that inevitably develop. Currently, the medical educational system does little to prepare physicians to meet these challenges in an effective, honest, and compassionate manner.

This article examines some of the issues and process steps involved in disclosure of a medical error involving a resident physician. We will highlight some of the key issues in graduate medical education that support error disclosure. In addition, we will address some of the barriers to effective disclosure and suggest means of addressing them.

The Error

Mr. Baldoroff, a 55-year-old man, presents to the emergency department (ED) with active chest pain. He has a history of hypertension, hypercholesterolemia, and type 2 diabetes and a 50 pack-year smoking history.

Dr. Georges, an intern on his first day of service in the ED, evaluates Mr. Baldoroff. Dr. Georges is tired because a scheduling mistake had him on call and then on duty in the ED, but he is excited and eager to do well on this new rotation. He performs a history and physical examination, obtains an electrocardiogram (ECG), and presents Mr. Baldoroff's case to his attending physician, Dr. Potter. They compare the patient's ECG with one obtained during his recent visit to the primary care clinic. No changes are noted, but Dr. Georges and Dr. Potter agree that the leading diagnosis is cardiac chest pain, and they formulate a workup and treatment plan.

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After administration of three sublingual nitroglycerin, aspirin, and oxygen, Mr. Baldoroff's chest pain persists. The nurse, Ms. Wilms, cannot immediately locate Dr. Georges and is unsure who he is, so she approaches Dr. Potter, who gives a verbal order to begin a low-dose nitroglycerin drip. Dr. Potter has a personal rule never to give orders on his residents' patients, but the urgency to improve Mr. Baldoroff's condition leads him to override this rule. The ED also has a policy of no verbal orders, but Ms. Wilms follows the order since it was given by an attending. Because the department is so busy, she does not take time to write the order and proceeds to set up the drip. The ED is overcrowded with patients and no intravenous (IV) pumps are available, so Ms. Wilms asks the clerk to order more pumps and then calculates the nitroglycerin drip rate and starts it without a pump. Almost immediately, Mr. Baldoroff's blood pressure drops to 90/60 mm Hg, and he complains of feeling lightheaded.

Soon after, Dr. Georges reexamines Mr. Baldoroff and correctly identifies the signs and symptoms of hypotension. He checks the chart and determines that the last sublingual nitroglycerin was given more than 30 minutes ago. No documentation of the nitroglycerin drip exists, and Dr. Georges fails to notice that the fluid hanging is in fact nitroglycerin. He wishes to give a fluid bolus. No nurse is readily available and the department is very busy, so Dr. Georges decides to increase the rate of the only IV line running, which he believes to be normal saline. Dr. Georges is standing at the bedside to monitor the results of the "fluid bolus" when Ms. Wilms informs him that another line is needed and that Mr. Baldoroff is a "hard stick." She suggests a central line. Dr. Georges agrees and goes to find Dr. Potter to inform him of the drop in Mr. Baldoroff's blood pressure and the nurse's concern that they have poor IV access.

Dr. Georges returns with Dr. Potter to find Mr. Baldoroff profoundly hypotensive and unable to respond verbally. Dr. Potter sees that the rapidly running fluid is nitroglycerin; he shuts it off and shouts for a nurse. He instructs the nurse to hang 1 L of normal saline and place the patient in Trendelenburg. While Dr. Potter manages the airway, Dr. Georges inserts a femoral line. Dr. Georges recognizes that his "fluid bolus" was not normal saline, but things are moving so quickly he does not mention his mistake. In the absence of nitroglycerin and with a rapid infusion of fluid, Mr. Baldoroff's blood pressure and mental status improve and he returns to baseline. Suddenly gripped by a sense of fear and confusion about what just happened, Dr. Georges wonders what he should do.

The Dilemma

Dr. Georges is aware that the hospital has an error-reporting policy, but he is unsure whether this event needs to be reported. His mind races with questions:

- How could I have made this mistake?
- Is it necessary to reveal my mistake, since the error was corrected and no real harm was done?
- Who needs to know about this?

What is a Medical Error?

Dr. Georges has contributed to a significant error in the course of Mr. Baldoroff's medical management. The mistake could have been fatal and caused the patient to undergo an unnecessary procedure, but minimal harm was done. Despite the potential severity of the error, Dr. Georges is uncertain about the need to report it, which contributes to his confusion about what to do next. It is not uncommon for physicians to question what constitutes a medical error and whether and how to report such events. Understanding how errors are defined can help guide the physician's response to medical mishaps and enhance communication about these events.

The taxonomy for medical errors is still evolving, but several terms related to patient safety have been defined by the IOM and generally are well accepted (**Table 1**). It is important to note that poor or adverse patient outcomes are not always the result of errors in medical care and that not all medical errors result in adverse outcomes. A useful framework for identifying medical errors is shown in the **Figure**. Medical errors can be further classified by the type of intervention (**Table 2**).

The incident in this case would be classified as a preventable adverse event involving both active and latent errors. Although the final error was potentially serious, the ultimate outcome resulted in minimal patient harm.

How Do Errors Occur?

It is not surprising that Dr. Georges' first thought was: How could I have made this mistake? As Leape [5] notes, physicians are socialized during medical school and clinical training to strive for practice that is error free, and this belief is deeply ingrained in the culture of medicine. In reality, doctors are humans

and humans *do* make mistakes. When medical errors occur, however, they are less likely to result from one person's unsafe actions than from the interplay between systems and individuals. The case example is no exception. While it is true that Dr. Georges inadvertently increased the rate of a nitroglycerin drip, several factors and events outside his control set the stage to allow this error to occur.

First, the ED was busy and overcrowded with patients. The members of the medical team were hurried and deviated from normal protocols and practice patterns. This type of environment is rich in *error-producing conditions*, which arise largely from the design of the system of practice [6–8]. In this case, error-producing conditions relating to the human components of the system include high cognitive loads and decision density, frequent interruptions, transitions of care, and fatigue. Error-producing conditions related to the operating systems include insufficient supplies, excessive communication load, high noise levels, overcrowding, and time pressures.

Deviations from accepted safe operating procedures are examples of *violation-producing behaviors* or *active failures*, which Reason [7] defines as "unsafe acts committed by people who are in direct contact with the patient or system." All three members of the medical team committed such violations. Dr. Potter deviated from his personal rule never to give orders on his residents' patients, which created a significant knowledge gap for Dr. Georges. Dr. Potter also violated the ED's rule of no verbal orders, and Ms. Wilms perpetuated this violation by accepting the order. The lack of documentation to begin a low-dose nitroglycerin drip contributed substantially to the chain of events leading to the error and left Dr. Georges unaware of the therapy given to Mr. Baldoroff. This knowledge gap caused Dr. Georges to draw incorrect conclusions regarding the cause of Mr. Baldoroff's hypotension and resulted in an incorrect therapeutic action. Dr. Georges also committed a violation when he changed the fluid rate without writing an order or asking a nurse to perform the procedure.

In reviewing the actions of those on the front line of care, it is possible to see how the best intentions and an overloaded system can interact to set the stage for a medical error. Although each of these actions resulted in safety violations, none was done with malicious intent and all were seen as necessary to meet the work demand. In this case, Dr. Georges performed the final action in the chain of events that constituted the medical error. As he struggles to determine how to respond, a critical determinant of the outcome of this case lies in whether or not he discloses the error.

Table 1. IOM Nomenclature for Patient Safety

Term	Definition
Patient safety	Freedom from accidental injury. Ensuring patient safety involves establishing operational systems and processes that minimize the possibility of error and maximize the probability of intercepting errors when they occur.
Accident	An event that damages a system and disrupts the ongoing or future output of the system.
Error	Failure of a planned action to be completed as intended (error of execution) or use of a wrong plan to achieve an aim (error of planning).
Active error	An error that occurs at the level of the front line operator and whose effects are felt almost immediately.
Latent error	An error in design, organization, training, or maintenance that leads to operator errors and whose effects typically lie dormant in the system for lengthy periods of time prior to their appearance.
Adverse event	An injury caused by medical management rather than by the underlying disease or condition of the patient.
Adverse medication event	An injury related to medication administration rather than the underlying disease or condition of the patient.
Preventable adverse event	An adverse event attributable to error or equipment failure.
Negligent adverse event	An adverse event that meets the legal criteria for negligence.
Near miss	An event that could have resulted in an accident, injury, or illness but did not, either by chance or through timely intervention.

IOM = Institute of Medicine. (Data from [1].)

Which Errors Should be Reported?

Most hospitals and health care institutions have error-reporting policies and procedures, and residents should familiarize themselves with these local standards to ensure compliance. Error-reporting systems may be voluntary (ie, error reporting is encouraged by the institution and is at the discretion of the physician or provider who recognizes the error) or

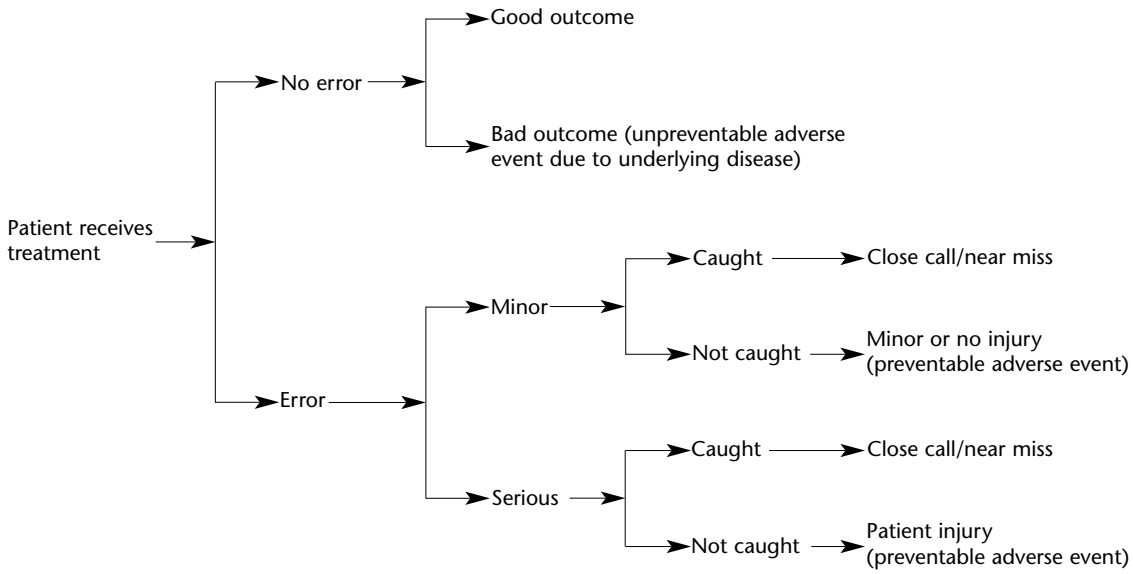

Figure. Framework for identifying medical errors. (Adapted with permission from Doing what counts for patient safety: federal actions to reduce medical errors and their impact. Report of the Quality Interagency Coordination Task Force [QuIC] to the President. Rockville [MD]: Agency for Healthcare Research and Quality; 2000. Available at www.quic.gov/report/fig1.htm. Accessed 23 Mar 2004. The US Department of Health and Human Services does not endorse derivative or excerpted materials and cannot be held liable for the content or use of adapted products.)

mandatory (ie, required by the institution, health care system, or state law).

It is clear that in all cases involving patient harm, not only should the voluntary reporting system be activated, but the institution's risk management department should be notified so that the correct level of investigation can ensue. Errors with the potential for patient harm that are caught before any harm occurs (a *close call* or *near miss*) also should be reported. Such errors are estimated to be orders of magnitude more common than those that cause harm [9]. Near miss incidents offer tremendous value for quality and safety improvement efforts, because they provide information on what went wrong as well as what went right. Understanding where resilience and opportunities for "cure" exist in a system is important. System designers and safety engineers can learn from these recoveries and strengthen processes of care to provide enhanced safety.

Finally, even seemingly trivial errors may be important to report through a voluntary reporting system, as these may represent latent failures within the system that, when combined, can allow a significant error trajectory to develop. For example, if promethazine 12.5 mg IV is ordered but 25 mg is administered, this is an error with little to no risk for an adverse outcome. However, an examination of the process of care that allowed this error to occur may result in process improvements that prevent other, more serious medication errors.

Returning to the case example, it is clear that the incident involving Mr. Baldoroff should be reported. The standard of patient harm (although minor) has been met. Further, the series of active and latent errors that transpired deserve close analysis so providers can learn which safety barriers were breached and identify process improvements to enhance care delivery.

Why Disclose Errors?

The Charter on Medical Professionalism serves as a useful guide for addressing the central dilemma in this case: whether to disclose the error. The Charter defines core principles and professional responsibilities that can guide physicians as they confront professional dilemmas in their daily practice (**Table 3**) [10]. In considering all physician responsibilities embodied by the Charter, it becomes apparent that disclosure to the patient, the attending physician, and the institution is appropriate in this case.

Professional Responsibility to the Patient

The Charter is very clear that the physician's responsibility to the patient extends beyond the delivery of

Table 2. Types of Errors

Diagnostic
Error or delay in diagnosis
Failure to employ indicated tests
Use of outmoded tests
Error in the performance of a test or diagnostic procedure
Failure to act on results of monitoring or testing
Treatment
Use of outmoded therapy
Error in the performance of an operation or therapeutic procedure
Error in administering a treatment
Error in the dose or methods of using a drug
Avoidable delay in treatment or in responding to an abnormal test
Inappropriate (not indicated) care
Preventive
Failure to provide proven prophylactic intervention
Inadequate monitoring or follow-up of treatment
Other
Failure of communication
Equipment failure
Other system failure

Adapted with permission from Leape L, Lawthers AG, Brennan TA, et al. Preventing medical injury. Qual Rev Bull 1993;19:144–9. Copyright © 1993.

Table 3. Principles and Professional Commitments of the Charter on Medical Professionalism

Guiding principles
Patient welfare
Patient autonomy
Social justice
Professional responsibilities
Professional competence
Honesty with patients
Patient confidentiality
Maintaining appropriate relations with patients
Improving quality of care
Improving access to care
Just distribution of finite resources
Scientific knowledge
Maintaining trust by managing conflicts of interest
Professional responsibilities

NOTE. This charter was written by the Medical Professionalism Project, a joint effort of the American Board of Internal Medicine Foundation, the American College of Physicians-American Society of Internal Medicine, and the European Federation of Internal Medicine. (Data from [10].)

competent care. The physician also is responsible for promoting the patient's best interests and partnering with the patient to help achieve the best possible health outcomes. A fundamental value of this relationship is trust between both parties, which relies on a commitment to honesty.

Failure to tell a patient about an error in his or her medical care is a breach of the patient's trust and violates a basic premise of the physician-patient relationship [11,12]. The uninformed patient may lose faith in the treatment plan, the physician, and the medical system if bad outcomes resulting from an error go unexplained. Telling the truth demonstrates respect for the patient and endorses the patient's right to self-determination and autonomy in care [12]. Disclosure also provides the patient with a realistic view of the limitations of medicine [5,11]. Patients need to recognize error as an inevitable part of the human condition and understand that even highly trained clinicians make mistakes [13]. Accepting that errors may occur despite the best attempts to prevent them is part of the informed consent process in modern health care. In fact, the physician's legal duty requires that the patient be informed of the necessary medical information needed to permit him or her to make an intelligent decision with regard to treatment, and the physician must reveal all that is in the patient's best interest [14,15]. Less than this, and the patient loses autonomy and the ability to rationally participate in the informed consent process.

Failure to disclose errors also may lead other physicians to question or misinterpret events in the patient's clinical course. In this case, Mr. Baldoroff's sudden drop in blood pressure was quickly traced to an inappropriately high rate of IV nitroglycerin. However, a more subtle error might have gone unnoticed, resulting in a search for the cause of the hypotension. Without the critical information provided by disclosure of an error, a patient may receive unnecessary testing or be inappropriately placed at a higher level of care, increasing the risk of iatrogenic harm. An initial failure to disclose a medical error could create greater risk to the patient's welfare as well as lead to an inappropriate distribution of finite resources. Therefore, error disclosure is a critical step that allows the patient to obtain timely and appropriate treatment to correct problems resulting from the

error, to prevent or mitigate further harm, and to retain trust in his or her provider [16].

In the absence of discussions with patients regarding their preferences for error disclosure, the physician should be guided by the literature, which suggests that patients desire complete disclosure of all errors, no matter how small. In a survey of 258 ED patients, Hobgood et al [17] found that 76% of patients wanted to be informed about any error and 88% wished to learn everything about a mistake. These empirical data are supported by qualitative data from patient focus groups conducted by Gallagher et al [18], in which all patients expressed feeling that they should be told of any error that occurred during their care. Patients were unambiguous in their belief that disclosure by the physician supported the foundation of trust in the physician-patient relationship. Further, they felt disclosure would reassure them that they were receiving complete information about their care [18]. The findings from these two studies support the patient's expectations of total honesty from their physician, free from conflicts of interests, and endorse the concept of open, honest communication.

Professional Responsibility to the Attending Physician

One of the physician responsibilities outlined in the Charter is commitment to professional competence, which means a collective effort on the part of the medical profession to ensure that all physicians achieve and maintain the knowledge and skills needed to provide quality care [10]. In learning environments, successessfully achieving this goal requires an active partnership between the resident and the attending physician. While the responsibility to teach and model professional behavior lies with the attending physician, the resident also must acknowledge personal gaps in knowledge and be open to learning from his mistakes.

The educational relationship between the resident and attending physician develops through direct observation and a mutual assessment of knowledge and skills applied in the delivery of patient care. During residency, medical knowledge learned from textbooks is honed at the bedside, while clinical skills and procedural competencies are continually tested in the course of supervised patient care. As a result of these resident-attending interactions, trust develops and leads to progressive responsibility and autonomy being conferred to the resident. This process is rich in significant learning experiences, some of which may be based on medical errors that occur during care delivery. When identified, these errors may indicate important knowledge deficits, inadequate clinical skills, or procedural incompetence. If discussed and used as the basis for educational development, such errors can be a source of significant learning.

Professional Responsibility to the Institution

Yet another professional responsibility outlined in the Charter is commitment to improving the quality of care, which encompasses efforts to help reduce medical errors and increase patient safety [10]. Without input from individuals on the front line of patient care, a health care institution is unaware of lapses in safety and errors that may have occurred as a result of care delivery. This lack of awareness results in perpetuation of care systems and processes that are permissive to human error.

Reason [7] notes that to improve safety in health care, we must recognize that error is a fundamental human condition and therefore strive to change the conditions under which we work. Success in this endeavor requires that errors be reported to institutions for aggressive exploration and root cause analysis. Without knowledge of how systems fail, an organization is helpless to prevent future errors. Error reporting makes it possible for clinical departments, hospital administration, and institutional care systems to examine processes of care for potential system improvements. In support of this process, many institutions have developed anonymous error-reporting systems to support providers and gain information about system failures. Many of these reporting systems have been implemented as a means to ensure compliance with the 2001 JCAHO standards for error disclosure [3]. These systems serve as an important means for institutions to ensure that patients are notified of lapses in safety that occur during care delivery. The involvement of risk management personnel early in the process can allow for mitigation of possible issues such as social injustices, breach of patient confidentiality, and lack of access to care [11,16,19,20].

Dr. Georges Decides What to Do

As Dr. Georges contemplates what he should do, Dr. Potter steps away to see another patient and Ms. Wilms leaves to get more fluid.

Mr. Baldoroff turns to Dr. Georges and asks, "What just happened? What's this big tube in my leg?"

Dr. Georges mutters noncommittal reassurances to Mr. Baldoroff. "Everything is all right, sir. You had a

brief episode of low blood pressure. You are fine now."

Dr. Georges realizes that Mr. Baldoroff needs an honest explanation of what happened, but he is unsure what he should or should not say. It is now clear that he must tell Dr. Potter about the mistake and ask for his guidance in talking with the patient.

The Dilemma

Although Dr. Georges recognizes the need to disclose the error to the patient and his attending, he worries what will happen when they find out.

- How will Mr. Baldoroff react? Could he sue me?
- Will Dr. Potter lose faith in me? Could I be suspended?

Common Barriers to Disclosure

The first rule of a physician is "*Primum non nocere*" ("First do no harm"). When a medical error occurs, particularly one that harms a patient, it shakes the foundation upon which a physician practices. The aftermath of an error results in an almost immediate conflict of interest as the potential repercussions of the mistake are examined.

In addition to concern for the patient, the physician often worries about how revealing an error will impact his or her professional career. Physicians acknowledge feeling ashamed and inadequate, doubting their competence, and fearing potential litigation [11,18,21,22]. Powerful emotions of guilt, fear, and anger may persist for days to years [23]. These persistent negative feelings may result in a lack of professional competence and may hinder the development of meaningful physician-patient relationships [11,13]. Prompt, honest discussion of an error, such as in morbidity and mortality (M and M) conference [18,22] or with trusted friends and colleagues [18,21], may help to reduce the lasting emotional sequelae of error.

Despite data suggesting that disclosure can help reduce the emotional upheaval caused by mistakes, physicians remain reluctant to disclose errors to patients or their families and to other physicians. Several significant barriers to acknowledging personal responsibility for error exist.

Reluctance to Tell Patients

In a multicenter survey of internal medicine residents by Wu et al [22], 90% of respondents admitted committing an error with serious adverse outcomes, including death in up to 31% of cases; however, only 24% reported that they had told the patient or patient's family about the mistake. Likewise, in a hypothetical vignette-based study by Novak et al [19], up to one-third of physicians said they would mislead the family by providing incomplete or misleading information. Using a similar vignette ending in a patient's death, Sweet and Bernat [20] found that up to 17% of physicians would tell the patient's family of the error only if asked directly, and 3% would deceive the family by telling them that nothing could have been done to prevent the death. In physician focus groups conducted by Gallagher et al [18], many physicians acknowledged that when they do disclose errors they choose their words carefully, often discussing the event but not that an error occurred.

Fear of litigation is a particularly important barrier to complete disclosure to patients or their families [14,18,20]. Many physicians believe that disclosure will increase the likelihood that patients will retaliate with legal action, although this belief has not been borne out by the literature. Witman et al [24] found that patients were significantly less likely to seek legal redress if the physician honestly disclosed the error. Similarly, Kraman and Hamm [25] report that an active hospital-wide policy to disclose all errors at the Veterans Affairs Medical Center in Lexington, KY, has actually reduced the malpractice rate at their institution. Finally, a survey of patients and families who sued subsequent to a medical incident revealed that the decision to take legal action was strongly influenced by the physician's and hospital's lack of honesty and reluctance to apologize [26].

Perceived Lack of Tolerance for Mistakes

Perhaps one of the most important factors limiting error disclosure can be found in the prevailing culture of medicine, which socializes physicians to strive for error-free practice [5]. This culture sets the stage for an unrealistic training standard and internal conflict when a resident makes a mistake. Indeed, training often is seen as a proving ground, where one must demonstrate worthiness as a physician and the attending physician is perceived as a judge rather than a human also capable of making a mistake. In addition to the emotional burden of committing an error, the resident is confronted with the stress of disclosing the error to an attending physician. The resident assumes that the attending has been tacitly taught, as he or she has, to hold oneself to a standard of error-free practice. This creates a conflict between meeting the ethical and professional duty to tell the truth (ie, to disclose the error to the attending physician and the

patient) and appearing to be a clinician who meets the high standard of error-free practice.

In the survey of residents by Wu et al [22], only 54% of respondents reported that they had informed the responsible attending physician of their error. The reasons for nondisclosure were not specifically evaluated. However, one may theorize that the residents feared losing the trust and respect of their attending physician, with subsequent loss of autonomy. Furthermore, residents may have worried that disclosure would result in an open discussion of the error among peers. It is well known that physicians fear that open acknowledgment of error will result in significant professional stigma, including shame and loss of professional stature among colleagues [11,16,21,27]. Residents in particular may fear that any loss of reputation during training could create professional or academic obstacles and limit future opportunities (eg, to obtain references, gain full medical licensure, advance to chief resident status, or secure a job in an increasingly competitive market).

Other factors limiting resident error disclosure to attending physicians may be entrenched in the culture of a particular program or institution. For example, residents may feel that a lack of suitable venues for meaningful discussion reflects a desire by the institution to limit error discussion [11,21]. Even in meetings where errors were discussed, residents noted feeling that critical issues such as the emotional upheaval caused by a significant error or the system factors that allowed the error to occur were not addressed [22]. Other program-specific barriers to disclosure may be the perception that remediation or extra clinical work will be required as a result of an error. In a survey of emergency medicine residency program directors, remediation for resident error was common, with 24% of program directors requiring additional lectures, 17% mandating written reports, and 9% requiring extra clinical duties [28]. In addition, 40% of programs reported holding residents responsible for presenting their own cases at M and M conferences for the purpose of enhancing teaching and enforcing personal responsibility for error [28].

Disclosure to Mr. Baldoroff

Dr. Georges finds Dr. Potter and asks if they can speak in private. Dr. Potter sees that Dr. Georges appears upset and asks if anything is wrong.

Dr. Georges blurts out, "I nearly killed Mr. Baldoroff! I made a mistake and turned up the nitroglycerin because I thought it was IV fluid."

Dr. Potter places his hand on Dr. Georges' shoulder. "Thank you for telling me. I was wondering why the rate was so high. Let's take a minute to reconstruct what happened, so we can figure out what to do. Please find Ms. Wilms, as I think she may have important information on this case."

The three team members reconstruct the events in Mr. Baldoroff's care. Soon it becomes clear that each of them bears some responsibility for the error and that several system factors could be modified to prevent or mitigate similar errors. Dr. Georges is relieved but still concerned about confronting Mr. Baldoroff.

"I think we should tell him, but I'm afraid he'll be angry."

"Why?" asks Dr. Potter.

"Well, I've never been in a situation like this before, but I'd be angry and I wouldn't blame Mr. Baldoroff for being mad, too. I just don't know what to say. Should I apologize? Accept responsibility?"

"Your first instinct to be honest with Mr. Baldoroff is appropriate and is endorsed by the Charter on Medical Professionalism," says Dr. Potter. "As for what to tell him, we should review the error disclosure policy recently passed by the hospital medical staff."

The team takes a few minutes to read the disclosure policy, after which Dr. Potter suggests they go to see Mr. Baldoroff and that he take the lead in discussing the event with the patient.

"Mr. Baldoroff," says Dr. Potter, "we need to discuss the events that just occurred with you."

"OK, that's good, because I'm pretty confused."

"Let's start from the beginning, so you can be clear on what happened. Your initial complaint of chest pain made us worry about your heart. Dr. Georges and I made a treatment plan that included nitroglycerin. After several doses under your tongue did not relieve your pain, I decided to increase your dose by giving it in your vein. I made a mistake by not telling Dr. Georges that I had made a change in your treatment plan."

"One of the side effects of nitroglycerin is low blood pressure, which caused you to feel lightheaded. Dr. Georges correctly identified your low blood pressure and tried to treat it by attempting to give you more fluid. Unfortunately, he did not realize that the IV contained not just regular fluid but nitroglycerin. Increasing the rate made your blood pressure go even lower and you blacked out. We needed to

get you fluids fast, so Dr. Georges placed the large IV in your leg while I made sure your body's oxygen was kept high."

Dr. Potter continued, "Generally IV nitroglycerin drips are kept on a pump that controls the rate and prevents mistakes like this from happening, but in your case we were out of pumps. The nurse started the nitroglycerin drip manually while waiting for more pumps to be delivered. In retrospect, this also was a mistake, but we were concerned that you needed the medicine and wanted to make sure you got it as quickly as possible. If I had informed Dr. Georges that I had started the drip and if the nurse had waited for the pump to be delivered, Dr. Georges would not have been able to turn up the nitroglycerin and cause your blood pressure to drop."

"I want you to know that all of us are very sorry that this occurred. We've discovered some important things about our system. To prevent this from happening again, I plan to make several suggestions to our quality improvement team. I'll also present this case at our institution-wide quality improvement conference so others can learn from this event."

Dr. Potter then asks, "Do you have any questions for me or the team?"

"No, not right now. Thank you for taking the time to tell me. It's easy to see how busy all of you are, and there a lot of patients who need your attention. Your explanation helps me understand how this could happen, and I respect your willingness to get to the bottom of this and not just shrug it off. Frankly, I was worried it was my heart."

"Thank you for your acceptance and understanding, Mr. Baldoroff. We try to prevent events such as these, but when they occur we also try to learn from so they won't happen again. I promise to make sure that the lessons we have learned are shared with others."

"How will you do that?"

"The first step will be to report this event to our institutional quality improvement team. They will help us do a more in-depth analysis and prepare educational materials for the other physicians in the hospital. They also will contact you to make sure all your questions and concerns have been addressed. Meanwhile, please feel free to contact me directly with any questions or concerns, and I will address them as best I can. Once again, we apologize for this sequence of events and thank you for your understanding."

What, When, and How Should Patients be Told About Errors?

No physician welcomes the challenge of telling patients about errors in their care. Nonetheless, these discussions must take place if we are to meet the principles of medical professionalism. Formal training in this area is lacking [29], and relatively little information is available to guide physicians in the process of error disclosure to patients. Existing data support the following conclusions about what, when, and how patients should be told about errors.

Above all, patients want to be informed of every mistake that occurs during the course of their care, even minor ones [17,18,24]. Further, the more serious the error, the greater the extent of discussion required [18,24]. In cases where harm has occurred, patients want to know what happened, why it happened, and how the physician will correct the problem. Patients also are concerned about how future errors will be prevented [18]. Even in cases where there was no harm, these are key points that should be included in error disclosure. Available data are unclear on whether or not to disclose near misses; both patients and physicians are divided on how to approach these events [18].

Patients also want to learn of error events early. In a cohort of ED patients, 76% of respondents wanted to learn of error events as soon as they were detected while 23% wished to learn of the error as soon as the extent of the error was known; only 1% of patients wished to wait to learn of the error until after hospital discharge [17]. This is strong evidence that the patient should be informed about an error even if all of the details of the event are not known. Following the initial notification, the patient should be updated on events as they transpire.

In general, the physician who has established the therapeutic relationship with the patient should deliver the news. In cases involving team care, the most senior member of the team should notify the patient and/or family. Many institutions have created disclosure teams to deliver error information or have developed detailed policy statements guiding how disclosure discussions should be carried out.

How Can Error Disclosure be Encouraged in Residency Programs?

The Association of American Medical Colleges acknowledges that residency programs face a unique challenge to create an educational environment that fosters acquisition of knowledge and skills by residents while reducing medical errors and encouraging

Teaching and Assessing Competence in Patient Safety

In its 2003 report, *Patient Safety and Graduate Medical Education*, the Association of American Medical Colleges noted that patient safety is a competency that "transcends" each of the general competencies outlined by the Accreditation Council for Graduate Medical Education [30]. Current educational systems are effective at assessing resident performance in the areas of patient care and medical knowledge. More difficult to evaluate but critically important to improving safety outcomes are the competencies of practice-based learning and improvement, interpersonal and communication skills, and professionalism.

Involving residents in quality assurance activities such as root cause analysis—fundamental activities of practice-based learning—mandates that residents demonstrate an understanding of quality improvement processes and develops in residents the expectation of contributing to the hospital community in a professional capacity [30]—a key component of professionalism. These activities also demonstrate communication of error events among professionals, ensuring that residents develop correct error nomenclature and learn to use it precisely.

Disclosing errors to patients after discussion with the responsible attending is fundamental to communication and professionalism competencies, and modeling these behaviors at the bedside is a valuable teaching technique. This is an important means by which attending physicians can establish a culture of safety surrounding error disclosure [11]. Rather than silently witnessing resident errors, attending physicians should actively assist residents with disclosure to patients. By personally modeling disclosure, attendings apply the principles of professionalism in a manner that not only supports the resident in this difficult communication encounter but also provides a template and the tools to become proficient. Supporting the development of professional behaviors in this way is vital to the resident's long-term success and career satisfaction [11,22]. Such educational approaches serve to maximize constructive learning about patient safety while improving the quality of care and advancing scientific knowledge gained from error events.

error disclosure [30] (*see sidebar for further discussion*). Clearly, residents will make mistakes, but many will not be as forthcoming as Dr. Georges and will fail to disclose their mistakes. How can educational systems be improved to break down the institutional and personal barriers that may deter a resident from disclosing errors to an attending physician?

Patients who were queried about what they considered important for educators to address in the realm of error management endorsed teaching residents to be honest and compassionate as well as providing specific training on how to tell patients about mistakes [17]. To ensure an educational environment that encourages resident disclosure of error, attending physicians must actively seek to create a positive, supportive educational culture. Attending physicians can work to reduce the barriers to error disclosure by acknowledging the external factors that impact residents' willingness to disclose errors. Attending leadership is particularly critical for developing nonjudgmental educational forums where errors can be discussed [22]. These forums may be formalized and take place at morning rounds or M and M conferences or in audit review and analysis. A nonjudgmental educational environment also must extend to the bedside and allow open resident-attending communication regarding all events; this serves as a source of clarification for the resident and defines an operating model of professionalism through the attending physician's behavior. Finally, a compelling way attending physicians can demonstrate support for patient safety is by showing their understanding and concern for the emotional state of the resident who has committed an error [21]. The error disclosure process should be therapeutic [16,31,32]. Data from multiple sources suggest that those who err will discuss the error with someone [18,22,29]. Successful attendings will model behaviors that inform their residents that "it's okay to tell me" and will promote disclosure through personal relationship building and trust.

Epilogue

Later that day, Mr. Baldoroff is admitted. Risk management is contacted regarding the error that

occurred in the ED and is apprised of the discussion that took place with Mr. Baldoroff.

When Dr. Potter comes to visit the following day, Mr. Baldoroff is feeling better and says he is relieved that the cause of his hypotension was a medical error and not his heart. He adds that he even feels that the event has strengthened his relationship with his doctors, because Dr. Potter and Dr. Georges "made an honest mistake and were big enough to stand up to it." The following day, Mr. Baldoroff is released from the hospital without further sequelae. No lawsuit evolves from the incident.

The week after the error involving Mr. Baldoroff, all physicians are instructed on IV pump management. In addition, special labels are developed to effectively mark which lines are entering the IV pump, and educational posters are developed and disseminated throughout the hospital, focusing on nursing pump use and written communication. A root cause analysis is performed and the causes of significant ED overcrowding are examined. The hospital convenes a special committee to investigate delays in accessing inpatient beds, which was determined to be one of the major reasons the ED was overcrowded.

Summary

In this case, a resident commits the final action in a chain of events that constitutes a medical error. Although Dr. Georges recognizes the error, he initially is conflicted about whether to disclose it. He ultimately recognizes that the patient requires and deserves an honest explanation of what happened and that he has a responsibility as a learner to inform his attending physician of the event. By being informed about the error, Dr. Potter is able to assist Dr. Georges with the disclosure process and to create educational value from the error event as well as the disclosure process. Further, disclosure of the error paves the way for a root cause analysis and identification of system improvements that will help ensure that similar errors are prevented in the future.

Dr. Georges has learned firsthand that error disclosure is a difficult process. His instinct to report the error was appropriately supported and modeled at the bedside by Dr. Potter. He now understands that error strikes at the core of the physicians' oath to "First do no harm," but he also accepts that in the practice of medicine, errors will occur. Open recognition of our errors and a willingness to confront our failures makes us better physicians and safeguards our most important resource, our patients.

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How to cite this article:
Hobgood C, Hevia A. Medical error disclosure: a professional standard. Semin Med Pract 2004;7:12–23. Available at www.turner-white.com.