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Successful remediation of patient safety incidents: A tale of two medication errors

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Abstract

Background: As patient safety acquires strategic importance for all stakeholders in the health care delivery chain, one promising mechanism centers on the proactive disclosure of medical errors to patients. Yet, disclosure and apology alone will not be effective in fully addressing patients' concerns after an adverse event unless they are paired with a remediation component.

Purpose: The purpose of this study was to identify key features of successful remediation efforts that accompany the proactive disclosure of medical errors to patients.

Approach: We describe and contrast two recent and very similar cases of preventable medical error involving inappropriate medication at a large tertiary-care academic medical center in the Midwestern United States.

Findings: Despite their similarity, the two medical errors led to very different health outcomes and remediation trajectories for the injured patients. Although one error causing no permanent harm was mismanaged to the lasting dissatisfaction of the patient, the other resulted in the death of the patient but was remediated to the point of allowing the family to come to terms with the loss and even restored a modicum of trust in the providers' sincerity.

Practice Implications: To maximize the opportunities for successful remediation, as soon as possible after the incident, providers should pledge to injured patients and their relatives that they will assist and accompany them in their recovery as long as necessary and then follow through on their pledge. As the two case studies show, it takes training and vigilance to ensure adherence to these principles and reach an optimal outcome for patients and their relatives.

Keywords

error remediation; medication errors; patient safety; patient satisfaction; quality improvement

Few events are as daunting for health care administrators to manage as lapses in patient safety. Medical errors invariably puncture an organization's day-to-day routine by reminding the physicians, the patients, and the public of the enormous stakes involved in today's sophisticated health care environment. They tragically lay bare operational weaknesses and human fallibility. They also require an immediate response by all those associated with the lapse and those who might have prevented it. As such, patient safety lapses constitute a canonical management challenge for administrators, which involves and will be closely watched by the patients, the medical professionals, the regulators, and the public.

Since the publication of the landmark report "To Err is Human" by the Institute of Medicine (Kohn, Corrigan, & Donaldson, 2000) a decade ago, patient safety has acquired a strategic importance for physicians and health care administrators alike (Leape & Berwick, 2005; Williams, Manwell, Konrad, & Linzer, 2007), and those responsible for managing health care practices and clinical institutions continue to explore countless ways to foster cultures and climates of patient safety within their respective institutions (Singer et al., 2009). Yet, creating a safety culture requires a comprehensive strategy and a sustained effort at all layers of the organization (Chuang, Ginsburg, & Berta, 2007; Williams et al., 2007).

Despite their salience, there is no consensus on how to manage patient safety lapses effectively and to the satisfaction of all affected parties. One very promising mechanism centers on the proactive disclosure of medical errors to patients. Proactive disclosure of medical error seeks to break the "wall of silence" (Gibson & Singh 2003) that frequently surrounds adverse events. It is intended to provide the injured patient with a description, an explanation, and, if warranted, an apology for the occurrence of the event. Survey evidence shows that patients who are confident in their providers' commitment to disclose medical errors are not more litigious and far more forgiving than patients who have no faith in their providers' commitment to disclose (Helmchen, Richards, & McDonald, 2010).

Despite its ethical imperative and patients' overwhelming preference for it, the practice of proactively disclosing medical errors to patients remains rare (Fein et al., 2007; Gallagher, Waterman, Ebers, Fraser, & Levinson, 2003; Taylor et al., 2008; Wu, Huang, Stokes, & Pronovost, 2009). Although frequently favored by providers and administrators in principle, the practice is also difficult and risky to implement ad hoc. Moreover, disclosure and apology alone will not be effective in fully addressing patients' concerns after an adverse event, unless they are paired with a remediation component.

As we argue elsewhere (McDonald et al., 2010), the proactive disclosure of medical errors should be viewed a process rather than a single event, and its successful implementation requires dedication and commitment at all layers of the organization. Although research is rapidly accumulating on the best practice of medical error disclosure (Fein et al., 2007; Gallagher, 2009; Gallagher, Bell, Smith, Mello, & McDonald, 2009; Wu et al., 2009), there is little evidence on the key features of successful remediation after the disclosure of medical error.

Analogous to clinical case reports, we offer a detailed description of how two cases of medical error were managed by a large, tertiary-care, academic medical center that has

developed one of the most advanced and comprehensive medical error disclosure and remediation processes in the United States. The two case studies lead us to identify four putative features that characterize the successful remediation of adverse events.

Conceptual Framework

Remediation is likely insufficient unless providers successfully address patients' loss of trust after they have sustained medical injury. Once they lose confidence in the provider's ability to deliver error-free medical care, patients may become suspicious of any remediation measures that the provider and the clinical care institution may propose. Given that patients and providers may have a disparate level of understanding related to medical errors as well as the range of potential remediation measures, the patients' apprehension is not surprising so long as they perceive themselves to be at an informational disadvantage vis-à-vis the provider. This suspicion may be compounded if patients falsely believe that remediation measures are limited to zero-sum propositions where any benefit for the patient represents a cost to the provider and institution.

Although it is true that the resources devoted to the patient's additional medical care made necessary by the error and the payments made in any financial settlement represent a net cost to the provider and institution, we argue that successful remediation goes beyond the zero-sum character of compensatory medical care and payments. More specifically, successful remediation urges the provider, administrators, and risk managers to think creatively and aggressively about meaningful ways to help patients and their relatives cope with their loss. For concreteness, we define remediation to be more successful the more the injured party is eventually convinced of the provider's sincerity in remedying the adverse event. To generate hypotheses about critical features of successful remediation efforts, we provide detailed descriptions of the treatment and remediation trajectories as well as an accounting of the eventual outcomes in two cases of clear medical error.

Methods

We describe two cases of preventable medical error at a large tertiary-care academic medical center in the Midwestern United States. Identifying details have been removed to protect the confidentiality of the individuals involved, but we have retained the relevant aspects of the treatment and remediation trajectories. Both cases were drawn from the universe of adverse events that were reported to and recorded by the medical center's Department of Safety and Risk Management between July 1, 2007, and June 30, 2009, that is, after the medical center's protocol for proactively disclosing and remedying adverse events had been fully implemented. To minimize the influence of confounding patient or procedure characteristics, we restricted our sample to demographically similar patients, namely, middle-aged women with no complicating comorbidities who were undergoing a routine, nonemergent surgical procedure. We further restricted the sample to the same type of clear medical error, namely, the failure to administer the correct dose or type of pain relief medication in an inpatient setting. To maximize the potential for generating hypotheses about key components of successful remediation, we retained two otherwise very similar cases whose treatment and remediation outcomes and their assessment by the parties involved differ sharply: Although

one error causing no permanent harm was mismanaged to the lasting dissatisfaction of the patient, the other resulted in the death of the patient but was remediated to the point of allowing the family to come to terms with the loss and even restored a modicum of trust in the providers' sincerity.

Rather than representative summaries, our detailed accounts of these counterintuitive remediation trajectories and outcomes are meant to convey the richness and complexity of managing adverse events. They suggest valuable lessons for individual providers, small group practices, and institutional administrators who may not be familiar with the processes of disclosure, apology, explanation, and remediation. Although case studies do not allow for the robust statistical identification of treatment effects, they are useful for generating hypotheses about factors involved in bringing about the observed variation in outcomes. Specifically, we use the two cases to generate four hypotheses about the nature, timing, and duration of successful remediation.

Findings

Case 1: Drug overdose

A successful antecedent procedure.—A middle-aged woman and mother of two small children was readmitted to the medical center for a repeat, elective procedure to correct the insufficient performance of a device that had been placed 2 weeks earlier. The woman was in relatively good health, and the first procedure had lasted less than an hour without complications. The patient did complain, however, to the operating physician, who had also administered the sedation, about having been “too awake and in pain” throughout the procedure. The physician was slightly puzzled by this complaint because, as he put it to the patient, he thought that he had delivered an amount of anesthesia sufficient to “kill a horse.” Nonetheless, he acknowledged the patient's discomfort and reassured her that any future procedures would involve an anesthesiologist.

The medication error.—On the day of the scheduled repeat elective procedure, the physician originally scheduled to administer the anesthesia was delayed in clinic. By the time preparations were completed, the anesthesiology service was no longer available for elective cases. Rather than canceling the procedure, the operating physician decided to administer the sedation again himself, as he had done during the first procedure 2 weeks earlier. To avoid a repetition of the patient's discomfort, however, the physician decided to provide a deeper level of moderate sedation.

The patient was placed in the prone position with the lights dimmed during the procedure. The nurse assisting with the sedation watched for patient movement to assess respiratory rate. Toward the end of the procedure, the patient's blood oxygen level plummeted to a dangerously low level and the patient was turned to the supine position to initiate manual ventilation. Attempts to ventilate were unsuccessful, a full cardiopulmonary arrest ensued, and the code team was activated.

With the overhead announcement of a “number one emergency,” attending and resident physicians from different departments arrived in the operating room. A sustainable cardiac

rhythm was obtained, but only after the patient had suffered irreversible anoxic brain injury that led to a diagnosis of brain death several days later.

An incident report activates the medical center's comprehensive adverse event response process.—Upon notification of the cardiac arrest in the operating room, the head nurse of the intensive care unit (ICU) notified the medical center's Director of Safety and Risk Management, who immediately went to the operating room. She retrieved paper printouts of patient vital sign measurements, including blood oxygen levels, which had been inadvertently discarded in a nearby trash can by the housekeeping staff right after the patient had been taken to the ICU. Because of the cardiac arrest, many of the vital signs on the printout had not been captured on the moderate sedation paper form. They would later prove essential to reconstructing the sequence of events that led to the cardiac arrest.

Initial communication with the family.—When the duration of the procedure seemed to take longer than the first procedure only 2 weeks earlier, the patient's family became concerned.

Immediately after the incident, the patient's physician and hospital safety specialists met with the patient's husband and other family members, expressed their own sadness over the events, and assured the family that a detailed investigation was already in progress. They also assured the family that they would receive frequent updates as more facts surrounding the incident could be ascertained.

Incident investigation.—After reviewing all information surrounding the adverse event, including the previously discarded printouts, the physicians and the risk managers investigating the incident determined that there had been a delay in recognizing the patient's respiratory depression, apnea, and subsequent hypoxemia and that this delay had caused the full cardiac arrest and subsequent anoxic injuries.

Disclosure and apology.—Within 72 hours of the incident, physicians and administrators representing the medical center shared these conclusions with the family. They apologized for the inappropriate care and assured the family that they would stay in close communication to share any new information.

The family's reaction.—The patient's husband, distraught and primarily focused on retribution, demanded that the physician who had performed the procedure and administered the anesthetic be fired and stripped of his license. When the division chief of critical care medicine along with the safety specialists attempted to explain that no one involved in the patient's care had behaved recklessly or knowingly exposed the patient to unnecessary risk and that the cause of the cardiac arrest was a breakdown in team communication, the husband was not assuaged. His antagonism intensified even toward those from the Department of Safety and Risk Management, who had provided a full disclosure, an apology, a promise of nonabandonment, and an offer of help to him and his family. Yet, the husband continued to express retribution as his overwhelming desire.

With the exception of the patient's husband, the family bonded with the care providers and the safety specialists, who tried to provide support for the family. Nonetheless, they remained haunted by the phrase "enough to kill a horse" and their own vivid images of the chaotic aftermath of the incident.

Remediation.—After the event, representatives of the medical center promised the family that they would assume all expenses related to the event, and when the family desired, they would be willing to put them in contact with those who could help resolve future financial matters related to the death of the patient.

Organ donation.—In due time, the Gift of Hope organization inquired about the possibility of harvesting the patient's viable organs. Because of the circumstances surrounding the case, the county coroner on the case ruled against an organ harvest because he believed an analysis of all of the patient's organs would be needed for legal proceedings. The patient's father, however, felt that the medical center's candid approach had made legal proceedings unnecessary and gave permission for the organs to be harvested.

Attendance at the funeral and payment of funeral expenses.—Medical center staff attended the funeral and the subsequent luncheon, which was paid for by the medical center. At the luncheon, the father of the patient publicly thanked the medical center staff for their honesty and support after the tragic event.

Financial settlement.—In an agreement between the patient's family and the medical center, the husband has been provided with the financial security to care for his two children and to provide for their future needs. Consistent with studies showing that lawsuits are often associated with the injured patient's perceived lack of open and honest communication on the part of the physician (Hickson, Clayton, Githens, & Sloane, 1992; Hickson et al., 2002), no formal lawsuit or claim was ever filed. However, the family did retain legal counsel, who was paid the customary contingency fee at the conclusion of the settlement, although the discovery process had been shortened considerably by the medical center's prompt admission of fault. The medical center's safety specialists have continued to maintain periodic contact with the family, after the medical center's position that "full disclosure" is a process and not a single event.

Closure.—Nearly on the anniversary of the incident, the patient's husband, father, mother, and sister met one of the patient's care providers along with the leader of the disclosure team for lunch. The husband asked again about corrective actions in relation to the physician primarily involved in his wife's care. Just as before, the medical center representatives explained how the fault for his wife's death was laid upon the entire system and not simply one person. After several more moments of discussion, the husband turned to the leader of the disclosure team and apologized for harboring intense animosity toward the team leader, who had refrained from instituting serious corrective action against any single individual within the medical center. The husband now realized the courage it had taken to preserve previously discarded evidence of the medical errors and to openly share that information with him and the family.

Subsequent discussion focused on the family's desire to be included in future patient safety improvement efforts at the medical center. Family members have agreed to serve as "the conscience of the community" on the medical center's root cause analysis and safety committee. Other opportunities to create a legacy for the patient were also discussed and will be further visited later on because the family continues to cope with the patient's death. At this time, the patient's relatives state that the medical center has made a sincere effort to remove any residual concerns they may have had about the outcomes of the remediation process.

Case 2: Drug allergy

A middle-aged woman underwent a successful and common elective surgical procedure.

The medication error.—Before the surgery, the patient had reported an allergy to aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs). As the medication allergy had been entered as "free text" into the patient's electronic health record, the computerized physician order entry system did not warn and prevent a resident physician from ordering the NSAID ketorolac as part of a preapproved order set for postoperative pain control.

Despite the documented allergy to the NSAID, the nurse administered two consecutive doses and shortly thereafter the patient's resulting severe respiratory distress required admission to the ICU.

Medical management and the patient's survival.—Eventually, the critical care service stabilized the patient, and she survived the adverse drug reaction without any permanent injury.

Disclosure and apology.—The medical team informed the patient of the error and how it had caused her need for admission to the ICU. Unfortunately, and against the medical center's guidelines, the team failed to notify the Department of Safety and Risk Management. Because the medical staff failed to notify the medical center's safety personnel, the disclosure and the apology were not paired with any plan and offers of remediation. In contravention of the established protocol for patient safety incidents, the failure to activate the comprehensive error response process led the medical center's collections agency to send the patient an invoice with the associated collection threats for her care in the ICU. The Department of Safety and Risk Management only learned about the incident after the patient had sent a complaint to the medical center's chief financial officer, who promptly met with the patient to offer a forthright explanation of the adverse event and of the medical center's efforts of remediation, including an immediate waiver of all medical expenses related to the incident.

Remediation.—A subsequent investigation into the event revealed that coughing and other complications resulting from the respiratory distress related to the medication error had undermined the effectiveness of the surgery. With the assistance of her attorney, the patient reached a financial settlement with the medical center. The patient decided to seek further care elsewhere, however, which was also paid for by the medical center. Both the medical center's administrators and the physicians viewed these outcomes as less than optimal: an

opportunity to work cooperatively, rather than adversarially, with the patient in providing compensation and restoring a modicum of trust in the medical center's quality of care had been missed.

How Two Similar Cases Yielded Two Different Remediation Outcomes

We contrast the management and aftermath of two medication errors at a large tertiary-care academic medical center in the Midwestern United States (Table 1). Errors in both cases flowed from attempts to provide pain relief, albeit in inappropriate doses or medications, that led to respiratory insufficiency and compromised oxygen delivery. In one case, the reaction was less severe and fortunately noticed in time for the patient to receive interventions and survive. In the other case, the adverse reaction was not noticed in time, and the patient subsequently died.

In both cases, either the patient herself or the patient's relatives learned very soon about the error.

In both cases, disclosure and apology took place, necessary additional medical care was provided, and a financial settlement was reached. However, the drug allergy case left the patient as well as the physicians and administrators at the medical center more frustrated than the drug overdose case.

Given the circumstances surrounding the error and the patient's health trajectory after the error, the drug overdose case would seem much harder to manage than the drug allergy case. Yet, the outcomes of the remediation process were arguably more satisfying for both the family and the medical center in the drug overdose case. As we discuss in the next section, one key to understanding the difference in remediation outcomes lies in the timing of the initial response by the medical center. After the drug overdose, the disclosure protocol was followed with prompt precision. By contrast, delays in activating the disclosure protocol compounded the adverse clinical consequences of the missed drug allergy, making it exceedingly difficult to reestablish the patient's trust in the medical center's competence and compassion.

The contrast between the severity of error and the quality of its eventual resolution in these two cases cautions against prematurely classifying errors into "easy" and "hard" cases to disclose and remediate. As described earlier, a fatal error that looked nearly impossible to redeem to the satisfaction of the patient's relatives was met with acts of remediation and reconciliation that earned the family's gratitude; conversely, an error that left no permanent physical injury irretrievably alienated the patient and left her with a permanently bitter memory of the medical center, saddling it with a string of more expensive outside hospital bills.

The two case studies demonstrate that the effectiveness of the disclosure process is sensitive to timing and execution after the adverse event. The two cases also demonstrate that the disclosure and remediation acts alone are likely insufficient for success. In fact, the contrasting responses by the injured party to the medical center's remediation efforts exemplify the fluidity and malleability of patients' perceptions and attitudes after an adverse

event. They show the scope that all members in the health care delivery chain have in shaping these perceptions by adhering to the maxims of successful remediation. Rather than the nature of the incident itself, it is the remediation effort that will determine whether disclosure achieves closure.

Practice Implications

Although not conclusive, the two case studies suggest four interlocking characteristics of successful remediation. We present our conjectures as four hypotheses (Table 2):

1. Activate the disclosure process immediately after the adverse event.

In addition to any physical and psychological harm, medical errors erode the trust that patients place in the medical center. As the two cases illustrate, without trust the patient remains suspicious and thus reluctant to agree to any of the medical center's remediation proposals, no matter how well-intentioned and beneficial they might be.

After a medical error, the medical center can only hope to rebuild the patient's trust if it demonstrates that the medical and administrative staff take the patient's welfare seriously, and one necessary condition for remediation to be effective appears to be the prompt activation of the disclosure protocol. Patients and their relatives continuously scrutinize the behavior of all medical staff charged with the patient's care for any signs of an adverse event. They do so out of concern for their health along with a natural inclination to know what is happening to them. As soon as patients believe that they are detecting an adverse event, they begin to revise, often subconsciously, their estimate of the treatment outcome and to plan their response to this new information—even before any medical staff describe or explain the circumstances.

Therefore, it is important to recognize that patients and their relatives frequently learn first about the adverse event in random, incomplete, and unstructured ways. In the drug overdose case, the family knew already that the patient had been given enough anesthesia “to kill a horse,” that the procedure time was longer, and that distressed medical personnel had been rushing to and from the operating room.

Just as uncertain as they are about what happened, patients may be equally uncertain and ambivalent about what should happen next—even if at first they insist on a specific course of action, as the husband did in the drug overdose case when he demanded that the operating physician be fired. As patients may have little or no experience with adverse events, they are in need of guidance as they evaluate how to respond. This state of flux is where the provider has an opportunity to shape the expectations and plans of the patient and avoid unintentionally encouraging the patient to seek retribution instead of resolution. The more time passes before a calibrated initial communication takes place, the more entrenched patients may become in their perception of the adverse event and the less receptive they are to provider remediation proposals. In the drug allergy case, the failure of the medical staff to immediately notify the medical center's risk and safety managers prompted the patient to make decisions about subsequent treatment options without discussing her plans with the medical center. Perhaps not surprisingly, she opted to seek follow-up care elsewhere, which

severed the bond between the medical center and patient as well as precluded the optimal allocation of resources between necessary care, patient benefits, and new devices for patient safety.

For this reason, it is imperative that the medical team initiate the process of disclosure and remediation as soon as possible after the adverse event to begin repairing the damaged trust between the institution and the patient. Arguably, the importance of this maxim is nowhere more apparent than in the drug allergy case, where rather than the severity of the injury, it was the delay in activating the disclosure process that undermined the medical center's ability to salvage the patient's goodwill. In fact, the unsuccessful remediation outcome in the drug allergy case also points to the importance of developing mechanisms that reliably trigger the deployment of the disclosure protocol regardless of the apparent severity of the injury.

2. Explore and propose remediation arrangements beyond medical care and financial compensation.

Beyond medical management and financial compensation, which are costly to the provider and institution, the management of the two medication errors shows the importance that both parties explore remediation elements, including intangible ones, that are valuable to the patient and that can rebuild a trusting relationship.

Both the drug overdose case and the drug allergy case provide examples of actions that the provider could have undertaken at no additional cost but that would have improved the patient's and the family's welfare and satisfaction with the remediation measures.

In the drug overdose sedation case, the patient's family ended up paying a substantial fee to the plaintiff's attorney although liability had already been admitted. Such fees for plaintiffs are not uncommon to these types of legal proceedings and can also be compounded by additional costs from insurance lien payments. Alternatively, the medical center could have paid a smaller sum directly to the family, still equal to the family's prior award, and deposited the amount that would have otherwise gone toward plaintiff's legal and associated fees into a trust fund in the family's name. This trust fund would have been administered by the medical center to fund its patient safety education, training, and outreach initiatives. In addition, this alternative arrangement would have been more advantageous to both the medical center and the patient's family: The family would have had the satisfaction of seeing the patient's memory preserved and the medical center would have had access to additional resources for patient safety improvements.

Although the missed opportunity in the drug overdose case resulted from a lack of imagination on the part of the medical center, in the drug allergy case, opportunities for more creative and effective remediation efforts were undermined by the initial poor handling of the adverse event and the delay in the disclosure process. The patient ultimately sought all care subsequent to the medication error from a different provider at the expense of the medical center—less because of perceived differences in quality and more of a loss of faith in the institution. In addition to the intangible loss of trust, this outcome may have prevented both parties from minimizing their purely monetary losses, if the patient had received all

subsequent care at the medical center. To waive her fees would have been less costly for the medical center, and again, the medical center could have shared these cost savings with the patient. As in the drug overdose case, both parties missed an opportunity to make the patient better off at no additional cost to the provider.

Other remediation measures, sometimes referred to as *benevolent gestures*, might prove more costly to the provider and institution but are more than justified by the additional value they provide to the patient. For instance, in the drug overdose case, the chief safety officer's spontaneous offer to cover the expenses incurred in connection with the patient's funeral was costly to the medical center but was valued enormously by the family, as evidenced by the patient's father's public recognition of the medical staff at the gathering after the funeral. It may have also made the family more receptive to subsequent remediation efforts, like the family choosing to override the coroner's advice and authorize the medical center to harvest the patient's organs for transplantation purposes. In this way, preserving and regaining trust paved a path for invaluable "gifts of hope" through the eponymous organ and tissue donor network. Also, the meeting with the family a year after the incident may have required little additional time and attention of the medical center's chief safety officer, but it was instrumental in allowing the patient's husband to come to terms with the adverse outcome and its handling by the medical center. More generally, the willingness not only of senior administrators but also of senior physicians to remain in contact with the family may have contributed to this outcome.

In contrast, the drug allergy case provides an example of a missed opportunity to improve the remediation process. To her consternation, the patient was charged initially for the care made necessary by the medication error, aggravating her antagonism toward the medical center so much that she sought subsequent care elsewhere. If the medical center's risk managers had been notified in time about the medication error, no bills would have been sent, thus sparing the patient the burden and anxiety of coping with this administrative error in addition to the medical error.

The examples given earlier show that successful remediation does not lure patients and their advocates into accepting offers from the provider and institution that are unfavorable to them, nor does successful remediation ask providers and the institution they represent to be excessively accommodating toward the patient. Rather, successful remediation identifies actions beyond the requisite remedial medical care and possibly financial compensation that cost the provider little extra but that will leave the patient and his or her relatives with a feeling that they have made the best out of a tragic situation. As such, successful remediation insists that both transcend the narrow concept of rectifying the error and urges the provider and institution to think creatively and aggressively about inexpensive yet meaningful ways to help patients and their relatives come to terms with their loss and begin to repair any damaged trust.

3. Leverage successful disclosure for successful remediation and vice versa.

Timely disclosure and apology help to build a foundation of trust and open communication, essential for any remediation efforts to be successful. The drug overdose case provides an example of how the prompt initiation of the disclosure process was essential in facilitating at

least one remediation effort that was time sensitive (i.e., disregarding the advice of the coroner and proceeding with voluntary organ donation) as well as setting the stage for future remediation efforts.

Equally important, patients and their relatives will also measure the quality of any disclosure and apology by the remediation efforts put forth by the provider. Unless it is paired with a thoughtful set of remediation proposals, merely saying, “I’m sorry” will feel hollow to the patient. In the drug allergy case, once the patient had regained consciousness, the medical staff immediately disclosed and apologized for the medical error. However, the medical center did not offer the patient any benevolent gestures nor ideas regarding remediation, as it had done in the drug overdose case. Moreover, the botched administration of the disclosure protocol compounded the issues and blatantly undermined the credibility of the apology and the institution.

4. Let the injured party choose when to conclude remediation efforts.

The imperative to remain committed to the patient’s recovery gives rise to another maxim, namely, that the medical center should explore net value-creating remediation efforts as long as necessary and not be content with letting the remediation effort atrophy into a mere administrative act. In short, successful remediation ends when the patient decides that there are no more additional actions that the medical center can undertake at little or no cost that would yield substantial value to the patient or to his or her relatives.

In the drug overdose case, when the patient’s family met with the chief safety officer a year after the incident to discuss the structure of their financial settlement, the patient’s husband was finally receptive enough to the chief safety officer’s account of the incident to accept the medical center’s disclosure, explanation, and apology. This turn in the husband’s attitude illustrates how valuable patience and persistence on the part of the medical center are in helping patients and relatives ultimately come to terms with the adverse event.

As a caveat to the aforementioned four principles, it is possible that the divergent remediation outcomes of the two medication errors were driven more by contemporaneous confounders, such as the injured parties’ temperament or idiosyncratic advice from legal counsel, rather than by the variation in the putative determinants represented by the four hypotheses discussed earlier. However, these hypotheses are all testable in principle, and these issues of isolation and individuality are intrinsic to any case study analysis.

Conclusions

Full disclosure of medical error, including a forthright description and explanation of the error, and an apology can help restore the trust necessary for the patient to take seriously the provider’s remediation proposals. At the same time, no disclosure of medical error will be viewed as satisfactory, and no apology will be viewed as sincere without successful remediation.

In fact, the remediation component of managing a medical error may well be more instrumental in shaping the parties’ eventual ability to come to terms with the adverse event

than the precise nature of the error itself. As we have shown, a failed remediation effort will only compound the patient's harm, whereas a successful effort can alleviate it.

When the aim is to convince the injured party of the provider's sincerity in remedying the adverse event, successful remediation efforts must go beyond providing the additional medical care made necessary by the error and financial compensation to help patients and their relatives cope with their loss (Boothman, Blackwell, Campbell, Commiskey, & Anderson, 2009). Although not definitive, the case studies we present suggest two simple maxims that should aid providers in maximizing opportunities for successful remediation:

1. Get there early. As soon as possible after the incident, pledge to injured patients and their relatives that you will assist and accompany them in their recovery as long as necessary.
2. Stay late. Follow through on your pledge.

As the two cases of medication error illustrate, adherence to these two maxims is far from simple. That the maxims would not be reliably followed even at an institution that has made disclosure and remediation an integral part of its care protocols only shows that these maxims are neither self-evident nor intuitive and that it takes training and vigilance to ensure adherence.

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Table 1

Remediation trajectories of two medication errors

Case 1: Drug overdose						
MC	Medical team notifies risk managers, who retain documentation and begin disclosure and investigation	Within 72 hours, MC discloses investigation results to the patient's relatives	MC assumes all incident-related expenses	MC pays for funeral expenses	MC negotiates financial settlement with patient's family	MC reaches out to patient's family to clarify any remaining questions surrounding the incident
Patient's relatives		Patient's father allows organ donation	Patient's husband is not assuaged		Patient's husband is still not assuaged	Patient's family accepts invitation to serve on MC's root cause analysis committee
Incident						
Patient			Patient complains to MC's chief financial officer		MC negotiates financial settlement with patient	Patient's husband accepts MC's apology and explanation
MC	Medical team discloses error without notifying risk managers	Failure to pair error disclosure with remediation plan	MC bills patient for incident-related care	MC waives all incident-related expenses		Patient seeks and MC pays for follow-up care elsewhere
Case 2: Drug allergy						

Note. MC = Medical Center.

Table 2

Practice recommendations for successful remediation of patient safety incidents

Practice recommendation	Application		
	Drug overdose	Drug allergy	
1	Activate the disclosure process immediately after the adverse event	Important incident information was retained and the family was informed quickly	Failure to learn promptly about the incident led to a delay in disclosure and a loss of trust
2	Explore and propose remediation arrangements beyond medical care and financial compensation	Provider covered funeral expenses and facilitated organ donation	No options were presented to the patient and she sought care elsewhere
3	Leverage successful disclosure for successful remediation and vice versa	Prompt disclosure helped rebuild the family's trust and cooperation in exploring remedies	Delay in comprehensive disclosure eroded the patient's willingness to explore remedies with the provider
4	Let the injured party choose when to conclude remediation efforts	Physicians and administrators remain in contact with the patient's relatives to this day	The incident left the patient irreversibly alienated from the provider and led her to seek all future care at a different institution