

Beyond the Medical Record

Other Modes of Error Acknowledgment

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BACKGROUND: Studies before and since the 1999 Institute of Medicine report have noted the limitations of using medical record reporting for reliably quantifying and understanding medical error. Quantitative macro analyses of large datasets should be supplemented by small-scale qualitative studies to provide insight into micro-level daily events in clinical and hospital practice that contribute to errors and adverse events and how they are reported.

DESIGN: The study design involved semistructured face-to-face interviews with residents about the medical errors in which they recently had been involved and included questions regarding how those errors were acknowledged.

OBJECTIVE: This paper reports the ways in which medical error is or is not reported and residents' responses to a perceived medical error.

PARTICIPANTS: Twenty-six residents were randomly sampled from a total population of 85 residents working in a 600-bed teaching hospital.

MEASUREMENTS: Outcome measures were based on analysis of cases residents described. Using Ethnograph and traditional methods of content analysis, cases were categorized as Documented, Discussed, and Uncertain.

RESULTS: Of 73 cases, 30 (41.1%) were formally acknowledged and Documented in the medical record; 24 (32.9%) were addressed through Discussions but not documented; 19 cases (26%) cases were classified as Uncertain. Twelve cases involved medication errors, which were acknowledged in different categories.

CONCLUSIONS: The supervisory discussion, the informal discussion, and near-miss contain important information for improving clinical care. Our study also shows the need to improve residents' education to prepare them to recognize and address medical errors.

KEY WORDS: medical error; medical mistake; medical error acknowledgement; counting medical errors.

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The fact that medical error is a key concern of health care providers and the general public is hardly contested. The 1999 Institute of Medicine (IOM) report brought the issue of medical error to the forefront of national attention and has ignited a series of debates concerning the incidence and nature of medical errors and the accuracy of the estimates of preventable adverse events.¹⁻⁴ Much of the research that has been conducted since the release of the IOM report focuses on resolving these debates, particularly what constitutes an error^{5,6} and what constitutes an accurate estimate of the incidence of

medical error.^{4, 7-14} Other streams of research have also been building outside of medicine. These include well-developed fields like human factors engineering, medical sociology, and organizational theory and behavior.¹⁵⁻¹⁹

Studies from these perspectives focus less on quantifying medical errors and more on how to prevent them by understanding how errors are made visible to those working in the system so that they can be corrected before causing harm or how clinicians can learn from errors after they are manifest. Rather than using data from medical records or other archival sources, these studies try to understand the systemic aspects of error as they occur in micro-level daily events in clinical and hospital practice from the perspective of those who provide and receive care. And they are beginning to yield fruitful results, from individual case studies of patients who suffered severe consequences from medical errors²⁰ to residents' accounts of the daily clinical pressures they face.²¹

The study reported here belongs in this latter category. It is a qualitative analysis of residents' descriptions of the errors in which they were involved and their understanding of how those errors were acknowledged in the health care system. Improvements in patient safety depend in large part on increasing the quality and quantity of information physicians report about medical errors. Conceptually, the ideal process is: Willingness to Report—Form of Acknowledgment—Access to Information for Prevention.

This relies on practitioners documenting correctly or sharing critical information which potentially could be harmful to their image or career. Received wisdom is that because physicians are expected to be infallible and to function without error, they are unlikely to document or acknowledge their mistakes. But few studies have directly examined these ideas. To remedy this gap, in this study we focused on the actual experience of residents in a large hospital setting and sought to answer two questions. To what extent do residents acknowledge mistakes? In what ways do residents acknowledge mistakes?

METHODS

Data Collection

The study focused on the inpatient setting at a 600-bed American teaching hospital with a large graduate medical education program. We chose the research site for convenience, but we wanted a representative sample of respondents. Thus, we selected a random sample of 26 residents from the total population of 85 residents and stratified the sample by year of residency, gender, and specialty (17 surgery, 56 medicine, and 12 obstetrics/gynecology [OB/GYN], the 3 specialty residency programs sponsored by the hospital) and asked them to

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participate in the study. If a resident declined the invitation to participate, then another resident in that specialty was randomly selected by the same method. Only 3 declined.

A semistructured interview instrument was used to gather data, focusing on the resident's experience with 2 or 3 medical mishaps as well as other categories of relevant questions. (The instrument was developed from focus group discussions with young residents and experienced physicians.) Residents were asked to describe in detail medical mishaps they believed they had encountered. Interviews lasted between 1 and 2 hours, and were recorded and transcribed. In this paper, we have retained the language the residents used to describe the events they reported during the interviews. They often used lay language rather than more formal medical terminology.

Terminology

During interviews, we deliberately adopted the open-ended, neutral term "medical mishap" to elicit the residents' responses. The first question asked the resident to define "mishap." Responses reflected the range of definitions and lack of agreement found in the profession in general. (See note on definition diversity.*) Some defined it as "any bad outcome for the patient." Others focused on "procedural errors, no matter what the outcome." Most offered a simplistic definition, while a few gave more complex definitions.

Use of the broad term "mishap" encouraged residents to describe a variety of incidents. We wanted to avoid the negative, judgmental connotations of "mistake" or "error" and the formal implications of "adverse event." We also wanted residents to feel comfortable casting the net widely to describe incidents. "Mishap" worked well for purposes of gathering data in the interviews and, as hoped, captured a wide range of cases. Because our focus is on forms of acknowledgment for experienced mishaps, all cases have been categorized on that basis. (Detailed tables of all categorized cases are available upon request.)

We also used the term "near-miss" to categorize those mishaps that 1) were caught and rectified before an adverse event occurred, or 2) occurred but caused no harm to the patient.^{9,22-26} This approach proved useful in our effort to develop a detailed picture of how mishaps are handled and/or acknowledged as part of the daily routine of a large hospital.

Data Analysis

The main outcome measures were based on the analysis of cases from the interviews. Using Ethnograph (Qualis, Denver, CO), a computerized qualitative coding program, and traditional methods of content analysis, a matrix of all cases was developed, including information about how the resident

*Note on the diversity of definitions: the Institute of Medicine report, *To Err Is Human*, National Patient Safety Foundation material,^{1,34} and a variety of studies referenced in this paper^{2-7,12,13} reveal lack of agreement on terminology. Lawyers agree on terminology but physicians do not. Meanwhile, we are content with definitions provided by one of the great standard dictionaries,³⁵ which defines "mishap" as "to meet with misfortune; to happen unluckily (used impersonally)"; "error" as "to err in knowledge, perception, action, opinion or judgment." "Mistake" is offered as a synonym for "error."

thought the cases were acknowledged. We categorized residents' responses in 3 major ways: 1) those documented in the medical record (Documented); 2) those discussed in some form (Discussed); and 3) those in which the resident was uncertain about how the incident was acknowledged (Uncertain). The Documented cases were further subdivided into those 1) noted in the medical record; 2) those noted in the medical record and reviewed at a Death and Complications (D&C) conference; and 3) those reported to the risk management department. Discussed cases were divided into 1) supervisory discussions; 2) discussions leading to immediate corrective action, that is, the near-miss; or 3) informal discussions with peers.

RESULTS

Of 73 cases, 30 (41.1%) were formally acknowledged and Documented in the medical record; 24 (32.9%) were addressed through various forms of Discussion but not documented formally in any way. In 19 cases (26%) cases, the residents were Uncertain whether or not the incident was acknowledged (Table 1).

Documented (n=30)

Of 73 cases, the residents reported that 30 had been formally documented in the medical record. Of these, almost half also were reviewed at D&C conferences held in surgery or obstetrics/gynecology departments. Six also were reported to risk management.

Medical Record (n=30). The patient outcomes of these 30 cases ranged from minor to serious, but most patients recovered. The cases included missed diagnoses, problems with inserted tubes, poor supervision, and poor communication. Although residents were certain these cases were noted in the medical record, they were not always sure about the details of documentation.

In one case, the resident provided the following details: a nurse noticed that a chest tube was not placed properly and called the resident on duty. Although an x-ray was available, he read the wrong one and noted in the chart that the x-ray showed nothing wrong. The next day, a new x-ray was taken and read properly, and the tube was replaced. When asked how the case would appear in the record, the resident said, "Nothing would be noted that said, 'Wrong x-ray read.' The record would read 'tube was replaced.' All these details would

Table 1. How 73 Cases Were Acknowledged

Acknowledged Category of Mishap	Number (%)
Documented	30 (41.1)
Noted in medical record	30
Noted in medical record and reviewed at D&C conferences	13
Reported to risk management	6
Discussed: no documentation; action taken or reviewed	24 (32.9)
Supervisory discussion	11
Discussion leading to immediate corrective action: near-miss	11
Informal discussion with peers	2
Uncertain	19 (26)

Detailed tables of all categorized cases are contained in the Appendix (available online at www.jgim.org).

not appear in the record because at this point it's done, and there isn't anything that can change at this point for the patient. But the residents and attending talked about it."

Death and Complications Conference (n = 13). Among the 13 cases reviewed at a D&C conference, there were 7 deaths, 4 in surgery and 3 in obstetrics/gynecology. The 4 surgery deaths were all connected with missed information on x-rays. In one case, a 20-year-old man died after he went into cardiac arrest following surgery for neck lacerations resulting from a motor vehicle accident. A pericardial effusion was missed on x-ray, leading to hypoxia that resulted in death.

The 3 obstetrics/gynecology cases involved infants who were stillborn or died at birth. For example: a pregnant woman came into the hospital with cramping but was sent home because the resident missed the indication on ultrasound that the fetal membrane was about to burst. Later that day at another hospital the woman delivered a premature infant who died. The resident doubted the mishap caused the death of the fetus but thought proper care would have provided early information of the infant's death in utero.

In 6 other cases reviewed at the D&C conference the patients survived. Three mishaps were described by the residents as "known risks" of the surgical procedure involved. The other 3 cases included a delayed diagnosis, a resident's poor suturing technique, and an unnecessary procedure. In one of the "known risk" cases, abdominal perforation following laparoscopic surgery caused sepsis in a middle-aged patient, and a second operation was needed to repair the damage.

Risk Management Incident Reports (n = 6). Six cases, in addition to being noted in the medical record, were acknowledged in incident reports sent to the risk management department. Three involved errors by nonresident staff, 2 by nursing, 1 by radiology. In one case, a nurse gave a medication intramuscularly rather than intravenously. Another involved a heart attack patient who had a second heart attack at night. Because the nurse notified the wrong person, the patient was not aggressively treated, and the hospital stay was prolonged.

There were 2 disagreements over ethical issues. These involved 1) a resident who objected to a surgeon's decision not to operate on an elderly patient against family wishes, and 2) a resident indignant because an attending physician wanted to change a record. Adverse patient outcomes in the 6 cases ranged from none, to lengthened hospital stay, to death.

Discussions (n = 24)

Of 24 mishaps dealt with through discussions, 11 were supervisory discussions between the resident and others on the team, usually his/her superior. Eleven other cases were acknowledged in discussions that led to immediate corrective action, what we called near-misses. The remaining 2 cases were discussions solely between peer members of the team.

Supervisory Discussions (n = 11). Almost half of the mishaps were acknowledged only through discussion between the resident, a superior, and/or others on the team. Such discussions (often at morning rounds) are a routine part of the supervisory structure of resident education; they are the major way the work of residents is reviewed and corrected on a daily basis. Among the cases reported were 7 errors, 2 family issues, and 2

instances in which the resident was caught in the middle of a dispute between attending physicians.

The 7 cases of errors included the following:

1. Pneumonia was missed on an x-ray and the patient died.
2. A patient having a myocardial infarction was sent to the floor by the emergency department without proper medication.
3. A young patient with a potentially life-threatening condition (aortic dissection) was sent home inappropriately because of miscommunication between physicians.
4. A necrotizing infection developed in a chronically ill woman on parenteral nutrition because of nonsterile technique.
5. A patient with a necrotizing bacterial infection did not receive timely treatment as his condition worsened.
- 6./7. Chest tube placement caused pneumothorax in 2 patients.

Discussions Leading to Immediate Corrective Action: The Near-miss (n = 11). Eleven reported cases (10 internal medicine, 1 OB/GYN) were resolved immediately and designated near-misses. No harm came to the patient and exchange of information was limited to the relevant members of the team (resident, nurses, interns). Six cases involved medication errors; 3 involved failures to make the proper diagnosis; 1 was a treatment error; and 1 involved confusion over the similarity in names of two patients.

In this last case, the resident switched orders on two patients whose last names both began with "K," but the nurse caught the error. The opposite situation occurred in 2 other cases, where nurses administered haloperidol in a higher dose than indicated, but the resident caught the errors. In additional cases, the resident prevented a nurse from administering an inappropriate ACE inhibitor, and a patient with a diabetic foot ulcer was not given medication fast enough. Two cases involved the use of heparin. None of these near-miss cases were documented.

Uncertain Cases (n = 19)

In 19 cases, the resident told either a chief or attending physician about a problem but felt nothing was reported further, no action was taken, or the incident was ignored. Sometimes the resident reported the incident at shift change before leaving the hospital. Six were medication errors; 6 were errors in communication; 3 were misdiagnoses; 3 involved injuries from procedures (pneumothorax, hematoma), and 1 was an unnecessary treatment delay. The variety of errors described by the residents in this category reflects the same kinds of errors as found in other categories.

Medication Errors (n = 12)

Medication errors are acknowledged as one of the largest single-error categories. We charted medication errors reported by the residents and noted the diverse ways in which they are acknowledged.

Twelve cases involved medication errors, several of which have already been described. These were acknowledged in different ways (Table 2). They fall into almost all the categories already described. "Wrong medicine" was sometimes noted in the record, but sometimes it was not, because it was what we

Table 2. How 12 Cases of Medication Errors Were Acknowledged

Medication Error	Documented	Discussed	Uncertain
Wrong medicine	1	2	1
Wrong dose		2	2
Wrong timing		2	1 (patient died)
Wrong form	1		

have called a near-miss. "Wrong dose" is found as both a Near-miss and in the Uncertain category. "Wrong timing" is both a Near-Miss and Uncertain. "Wrong form" appears only in the record.

DISCUSSION

We started with the goals of understanding how and to what extent errors are acknowledged in the course of daily clinical practice. Our results offer a view from the trenches from the perspective of residents who ranged in experience from interns to fourth- or fifth-year veterans. The results demonstrate that medical mishaps are acknowledged and acted on in diverse ways. There is no simple, one-to-one relationship between the occurrence of a mishap and its reportability in the system. Many errors are not formally noted in the medical record but they are acknowledged in other ways that make them visible so that they can be corrected or can contribute to learning. The only notable association was between the severity of outcome and formal documentation in the medical record, at a D&C conference, and/or as an incident report. Half of the 11 cases so reported resulted in death to the patient ($n=4$) or the fetus ($n=3$).

The residents in the interviews identified 73 cases as falling within our loose definition of "mishap." If one accepts the "common" physician terminology, some are preventable adverse events and some are unpreventable. However, physicians do not agree about what is preventable and what is not.^{5,6,12} Some are near-misses according to the definition we propose, although some physicians would disagree. Those who systematically study these events have the difficult job of developing definitional consensus. Part of the challenge is intrinsic medical uncertainty and, therefore, varying professional opinions.^{12,17}

Formal Acknowledgment in the Medical Record, D&C Conference, or Incident Report

Formal acknowledgment provides concrete, easily countable evidence of a medical mishap. These recorded forms overlap but are by no means exhaustive. Although 41% of cases were documented formally, each form of documentation is constrained in terms of consistency of use, accuracy, and thoroughness of information provided. In our study, there was considerable discussion of mishaps that involved serious consequences that were not always formally acknowledged in the medical record, at a D&C conference, or in an incident report.

At the hospital site where our study was conducted, general surgery holds a D&C conference every week, and OB/GYN holds a similar conference every month. Internal medicine holds grand rounds but no D&C conference. Interviewed residents reported that the D&C conference is highly educational for them; they do not feel accused or held blameworthy for their actions. Most residents were forthcoming about their own

failures and also about the failures of their chiefs and attending physicians. One resident described the process as "very educational." "You stand up there and say, 'This is what happened.' And we're asked, 'Why do you think this happens? What could you have done to do this differently?' I think that's very appropriate. I can't think of a better way [to learn]." The D&C conference has great educational potential; however, there appears to be almost no effort to capture and formalize this potential systematically or systemically.²⁴⁻³³

The official policy at the research site is that every incident should be reported to risk management. Many hospitals are trying to establish such a policy so that risk management would be an important source of medical error information. Not all clinicians view risk management in the same way. In this study, only 6 of 73 cases were sent as incident reports to risk management. A chief resident in our study noted, "From a resident's point of view, the incident report is a good nurses' mechanism. But these often don't seem important medically. A doctor might phone the risk manager, warning about a possible suit, but this would not be documented." A young resident noted that in some cases the resident is too busy to prepare an incident report. "Some [residents] wouldn't have the time to report because it needs to be a formal letter. . . . So sometimes we just forget about it. . . . We don't have time to do it." The idea that every error should be reported in an incident report also ignores the fact that errors are not objective facts and they often are the outcomes of attempted solutions.

Supervisory Discussions Between Residents and Superiors

Residents acknowledged almost one third of the mishaps through a supervisory discussion between the resident and his/her superior. These discussions provide what might be called an "oral history" of the incident. This form of discussion is a key mechanism in the supervisory structure that characterizes graduate medical education and how learning takes place in complex health care systems. The hierarchy of supervision is supposed to guarantee that those with more experience and knowledge review the work of those with less.

According to resident interviewees, the discussions constitute a regular means of discussing a wide range of patient management and outcomes, including mistakes and adjustments in management. One chief resident suggested the supervisory discussion "often represents the retrospective realization that what was done to the patient represented the best medical judgment at the time, but may not look so good in retrospect. . . . All discussions involve corrective action in some time frame and on some level." This captures the intrinsic uncertainty found in clinical practice, and the power of evolving and sometimes conflicting assessments.^{12,17}

There do not appear to be systematic evaluations of these discussions as an effective educational tool, although many anecdotal reports suggest that what one learns during residency shapes later practice style. Further, because the content of the important discussions is not formally documented, it is not a source for counting or understanding patterns of errors. Individuals may learn, but the organization and the larger system do not.

Near-Misses

The 11 near-misses were all handled within the system with positive outcomes and were not documented formally. In all these instances, it might be argued that the system actually worked because the errors were caught in time. Despite breakdowns in communication, human fallibility, and other possible causative factors, the mishaps were captured within the safety net of the hospital system at some point before the patient was harmed.

The near-miss is a neglected form of acknowledgment with great potential as a model of prevention because it can reveal peer and self-scrutiny working effectively.^{9,22,24} According to one estimate, near-misses occur between 3 and 300 times more often than adverse events.⁹ There is a burgeoning literature about the near-miss,^{9,23-26} and its educational potential may be gaining recognition with the institution of root-cause analyses of near-misses²² and near-miss rounds.²⁴

Medication Errors

Despite their importance, our small sample suggests that medication errors are acknowledged in a variety of ways, and sometimes are not documented at all. This hinders the systematic study of patterns of medication error.

Uncertain Cases

Those cases in which the resident was uncertain about how a mishap was acknowledged remain confounding and disturbing. These represent one quarter (26%; 19/73) of our cases. Typically the younger residents in internal medicine in our sample reported the Uncertain cases. Possibly a young resident does not view an incident in the same way as an experienced doctor. Some cases represent a failure of chief and attending physicians to communicate with residents on small details of a case. An observation by an experienced attending physician who served as a medical expert for our study is revealing: "Really, major incidents don't get into anybody's report. I doubt they are documented in any fashion anywhere, even though you are aware of the problem."

Conclusions

Reliable systems have procedures and attributes that make errors visible so that they can be corrected before they cause harm and so that people can learn from errors in the normal course of their practice.¹ While this idea is laudable in theory, it may be unworkable unless practitioners systematically document or acknowledge mishaps or unsafe practices. In this study, we assumed that practicing health care providers are a rich and neglected source of information about practices in their own environment related to error. Retrospective event histories can offer a potentially novel perspective despite possible perceptual biases.

Although the results are not generalizable beyond the individual cases, our data offer rich insights into the process by which mishaps are acknowledged, reported, or ignored. By examining the spectrum of ways mistakes can be acknowledged, it is possible to capture the multiple, untoward events that take place in daily clinical care. Our study also shows the need to improve residents' education to better prepare them to recognize and address medical errors. The various forms of ac-

knowledge we have described have not been systematically evaluated for their educational and/or preventive value. Insights about the range of mistakes improve the ability to count errors, analyze the multiple factors contributing to mistakes, and help identify factors that can be used for educational and preventive purposes. The supervisory discussion, the informal discussion, and near-miss all contain important information for improving clinical care. These sources are not to be dismissed because they cannot yet be quantified.

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REFLECTIONS

2004 Creative Writing Contest Honorable Mention

What City, What Day

I was pushing the gurney
and the doctor walking beside it
kept asking questions of the prone man
who stared back at me as if for help
on a grade school quiz: Who is our
president? What city are you in?

Saints stood like stone lions
on either side of the elevator doors.
Going up, I put one palm over the man's cheek and ear. He'd
failed the questions. White heat
warmed my palm as the floors blurred by.

Then the man touched
the doctor's sleeve. Please, he pleaded,
I know people are starving
but don't let them eat me.
I can find the road. I can
get us to the kingdom.

NANCE VAN WINCKEL
Liberty Lake, WA.

—FROM FINAL JUDGE CORTNEY DAVIS—

"What City, What Day" is a lovely poem, a brief moment in which a confused patient, propelled along on his gurney, is being questioned by a doctor. The narrator observes this moment and all it implies: there are saints "like stone lions" flanking the elevator doors; when the sick man fails the doctor's mental status questions, the narrator touches the man's cheek and "white heat" warms her palm. The patient, pleading, reaches out for the doctor's sleeve. "I know people are starving," he says. This poem suggests the spiritual behind the everyday, the spark of the divine in each patient. More often than not, our patients do show us the way. This patient seems to have, in spite of what might be seen as craziness or dementia, the knowledge of where to take us. "I can find the road" he says. "I can/get us to the kingdom."