Reporting Systems

The Emotional Impact of Medical Errors on Practicing Physicians in the United States and Canada

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Medical errors are unfortunately inevitable in complex health care environments.[1–4] Although health care organizations regularly provide patients affected by medical errors and their families with counseling afterwards, the impact of errors on physicians can sometimes be overlooked.[5] With physicians holding themselves to high standards of excellence—even perfectionism—in providing patient care,[6] and patients and other health care workers expecting them to be "error-free,"[7] being involved with errors can increase physicians' job-related stress and cause significant emotional distress.

After medical errors, physicians have reported feeling upset, guilty, self-critical, depressed, and scared.[6,8–11] Physicians also have reported that their job satisfaction, ability to sleep, relationships with colleagues, and self-worth[8–10,12] were negatively affected. A recent study of 184 residents found that making a medical error was associated with a significant decrease in quality of life and increased rates of depression and burnout.[13] However, most research fails to clarify the scope of the problem in a large group of practicing physicians because it includes only residents, very small sample sizes, or personal narratives of individual physicians' experiences following errors.[5,8–10,13–17] Even less has been published about physicians' stress after near misses or minor errors.

One aspect of being involved in an error is deciding whether and how to disclose the error to the patient. Physicians contemplating disclosure can become concerned about harming the doctor-patient relationship,[18]

Article-at-a-Glance

Background: Being involved in medical errors can compound the job-related stress many physicians experience. The impact of errors on physicians was examined.

Methods: A survey completed by 3,171 of the 4,990 eligible physicians in internal medicine, pediatrics, family medicine, and surgery (64% response rate) examined how errors affected five work and life domains.

Results: Physicians reported increased anxiety about future errors (61%), loss of confidence (44%), sleeping difficulties (42%), reduced job satisfaction (42%), and harm to their reputation (13%) following errors. Physicians' job-related stress increased when they had been involved with a serious error. However, one third of physicians only involved with near misses also reported increased stress. Physicians were more likely to be distressed after serious errors when they were dissatisfied with error disclosure to patients (odds ratio [OR] = 3.86, confidence interval [CI] = 1.66, 9.00), perceived a greater risk of being sued (OR = .28, CI = 1.50, 3.48), spent greater than 75% time in clinical practice (OR = 2.20, CI = 1.60, 3.01), or were female (OR = 1.91, CI = 1.21, 3.02). Only 10% agreed that health care organizations adequately supported them in coping with error-related stress.

Discussion: Many physicians experience significant emotional distress and job-related stress following serious errors and near misses. Organizational resources to support physicians after errors should be improved.

future job sanctions, and potential malpractice litigation.[18–20] Although patient safety experts attempt to reduce the blame placed on physicians and other health professionals by reframing errors as problems with the health care system,[21,22] these safety messages may not be believed by providers working in an increasingly punitive malpractice climate.[23]

Getting support after errors also may be difficult for physicians, because they do not commonly use mental health services[24] and report discomfort talking to colleagues about their mistakes.[8,10,25,26] Failure to support the emotional needs of physicians following errors can have wide-ranging negative consequences for patient care and the health care system. Physicians who are very anxious after an error may lose sleep or have trouble concentrating, which may increase their risk of making medical errors in the future.[4,27–29] Others may become too cautious in practicing medicine, resulting in reduced access to specific procedures or poorer patient care,[20] or they may retire prematurely.[3,6,30,31] To safeguard high-quality patient care and design programs to better support physicians following errors, we need to understand how practicing physicians are personally affected by errors. Therefore, we surveyed 3,171 physicians in the United States and Canada to determine how their experience with medical errors and error disclosure affected their job-related stress, which physicians are most affected by errors, and how physicians could be better supported after errors occur.

Methods

PHYSICIAN SAMPLE

Between July 2003 and June 2004, physicians in the United States and Canada completed a survey about their experiences with medical errors and error disclosure. In the United States, we surveyed all clinically active physicians in internal medicine (general medicine and all subspecialties), surgery (general surgery and all specialties), family medicine, and pediatrics practicing at 13 BJC HealthCare hospitals (St. Louis); University of Washington; Seattle Children's Hospital and Regional Medical Center; and Group Health Permanente (Seattle).[23] Of the initial sample of 2,989 U.S. physicians, 197 were ineligible because they had retired or were not clinically active, resulting in 2,792 eligible physicians, 1,767 (63%) of whom completed surveys.

In Canada, we surveyed a nationally representative sample of 2,400 Canadian physicians (1,200 internists and 1,200 surgeons) drawn from the Canadian Medical Directory. No Canadian pediatricians were surveyed. Of this sample, 202 were found to be ineligible, resulting in 2,198 eligible physicians, 1,404 (64%) of whom completed surveys.

QUESTIONNAIRE DESIGN AND ADMINISTRATION

Physicians reported their demographic and practice characteristics and estimated the probability that they would be sued for malpractice in the next year (0%–100%). Respondents were asked to indicate whether they had ever been personally involved with a near miss, minor error, or serious error in their career. We provided established definitions of medical errors and adverse events from previous literature and asked the physicians to use these definitions when answering the questions.[21] After reviewing existing patient safety instruments and conducting physician cognitive interviews,[8,28] experts in patient safety and survey design developed questions to assess whether errors in which respondents had been involved affected their job satisfaction, confidence in their ability as physicians, professional reputation, anxiety about the potential for future errors, or ability to sleep, and whether they were interested in counseling after errors (Yes/No).[23] Physicians also reported whether they had disclosed (1) a serious error ever or (2) a minor error to patients in the past year ("yes" or "no") and how satisfied they were with how their most recent disclosure of serious and minor errors went (4-point scale: "very dissatisfied" to "very satisfied").

Finally, physicians reported how interested they would be in error disclosure training and access to counseling following a serious error ("not at all interested" to "very interested") and whether six concerns (for example, counseling would not be kept confidential if they were sued or would not be helpful) would be barriers to them seeking counseling (Yes/No). On a 4-point Likert scale ("strongly disagree" to "strongly agree"), physicians also rated their agreement with the statement, "hospitals and healthcare organizations adequately support physicians in coping with the stress associated with medical errors."

SURVEY IMPLEMENTATION

The survey was approved by the Institutional Review

Boards (IRBs) at Washington University School of Medicine, University of Washington, Group Health Cooperative, and the University of Toronto. Respondents gave their implied informed consent by completing either an anonymous paper or a Web-based survey. Multiple reminders were sent to participants by mail, e-mail, fax, or telephone.[32] Because of varying IRB regulations, we used different incentives to encourage participation at each United States site, including $5.00 coffee cards and a lottery for dinner at a local restaurant. No financial incentives were used in Canada.

Statistical Analysis

Because our intent was to examined the impact of medical errors on physicians, we limited our analyses to the 2,909 physicians who reported previous involvement with a harmful medical error or a near miss. Physicians were categorized into three discrete groups on the basis of the most severe error in which they had been involved (near miss, minor errors, or serious errors). We computed descriptive statistics and used chi-square tests of independence to examine how errors affected five areas of job-related stress and respondents' interest in error-related counseling services. Because of the large sample size, we defined a clinically meaningful difference to be at least 10% and to be statistically significant at the .001 level.

Using logistic regression with backwards stepwise selection, we determined whether physicians' demographic characteristics, attitudes about errors, and past error disclosure experience were associated with reporting that any of these five areas of job-related stress was affected after a harmful error or near miss (compared with not endorsing any stress type). Because chi-square analyses revealed that physicians who were involved with serious errors were significantly more likely to report that medical errors influenced their lives than physicians involved only with near misses and minor errors, we created two models to predict the impact of errors after (1) minor errors/near misses and (2) serious errors. Variables found to be significant in the univariate analyses ($p < .05$) were included in both the multivariate models. The final set of variables included gender, years in practice (< 5 years, 5–10 years, > 10 years), percentage of time spent in clinical practice (> 75%, ≤ 75%), perceptions of whether health care organizations adequately support physicians in coping with error-related stress (agree/disagree), assessment of personal malpractice risk (≥ 5% versus < 5%), whether they had ever disclosed an error (yes/no), and how satisfied they were with past disclosure experiences (never disclosed/satisfied/dissatisfied).

Results

Physician Characteristics

Surveys were completed by 3,171 (64% response rate) of the 4,990 eligible physicians in the United States and Canada. Ninety-two percent ($n = 2,909$) of the surveyed physicians had been involved with a near miss, minor error, or serious error. Respondent demographics are provided in Table 1 (page 470). Because the United States and Canadian respondents did not differ significantly in their error-related stress levels, attitudes about error-related support, or any demographic characteristics other than gender (30% United States female versus 15% Canadian, $X^2 = 88.5$, $p < .001$), the results from the two countries were combined.

Impact of Errors on Physicians

Physician distress following errors was common. Physicians reported that errors in which they had been involved increased their anxiety about the potential for future errors (61%) and negatively affected their confidence in their abilities as physicians (44%), ability to sleep (42%), job satisfaction (42%), and professional reputation (13%). Eighty-one percent of physicians reported that at least one of these types of job-related stress was affected.

Physicians who had experienced an error were divided into three groups on the basis of the most severe type of error in which they had been involved (a serious error [57%], a minor error [36%], or a near miss [7%]). Physicians' lives were more likely to be affected as error severity increased (Figure 1, page 471). Physicians who had been involved in a serious error were more likely to report that their anxiety about future errors (66% serious, 55% minor errors/near misses, $X^2 = 36.5$, $p < .001$), confidence as a physician (51% serious, 35% minor error/near misses, $X^2 = 75.9$, $p < .001$), job satisfaction (48% serious, 33% minor errors/near-misses, $X^2 = 65.4$, $p < .001$) and ability to sleep (48% serious, 33% minor errors/near misses, $X^2 = 64.7$, $p < .001$) were affected, as compared with physicians involved only with minor errors or near misses. However,

Table 1. Demographics of Participating Physicians*		
Characteristic	**Levels**	**Physicians % (N)**
Total Sample		100% (2,909)
Country	United States	55% (1,600)
	Canada	45% (1,309)
Specialty†	Internal Medicine	50% (1,433)
	Surgery	34% (991)
	Pediatrics	16% (456)
Gender	Male	77% (2,203)
Practice Setting	Academic	40% (1,076)
	Private	49% (1,337)
	Other Setting	11% (302)
% of Time in Clinical Practice	1–25%	8% (228)
	26–50%	10% (271)
	51–75%	19% (526)
	76–100%	64% (1,795)
Most Severe Error Involved with	Near Miss	7% (212)
	Minor Error	35% (1,032)
	Serious Error	57% (1,665)
Characteristic	**Mean**	**SD**
Average Age (years)	49	10
Years in Practice	16	10

* SD, standard deviation
† 29 respondents did not report a specialty.

more than one third of physicians who only had been involved with near misses also reported that errors had adversely affected their anxiety about future errors, professional confidence, job satisfaction, and ability to sleep.

Medical specialty differences were noted for only one type of job-related stress. Compared with pediatricians, surgeons and internal medicine physicians were more likely to report reduced job satisfaction following errors (34% versus 43% and 45%, X^2 = 16.7, $p < .001$).

SUPPORT FOLLOWING ERRORS

Ninety percent of physicians disagreed (37% strongly) that hospitals and health care organizations adequately support them in coping with stress associated with medical errors. Eighty-two percent of physicians reported that they were somewhat or very interested in counseling after a serious error occurred. Pediatricians were more likely to be very interested in counseling than internists or surgeons

(36% pediatricians, 30% internists, and 25% surgeons, X^2 = 47.4, $p < .001$).

Despite this interest, physicians perceived significant barriers to pursuing counseling after errors. More than one third of physicians felt that taking time away from work for counseling was difficult (43%), did not believe that counseling would be helpful (35%), were concerned that what was said in a counseling session would not be kept confidential if they were sued (35%), and were concerned that their counseling history would be placed in their permanent record (34%). In addition, 23% of physicians were concerned that receiving counseling could affect their malpractice insurance costs, and 18% were concerned that they would be judged negatively by their colleagues. Surgeons were more likely than other physician groups to report that a barrier to seeking counseling was that they did not believe that it would be helpful (42% surgeons, 34% internists, 25% pediatricians, X^2 = 37.4, $p < .001$).

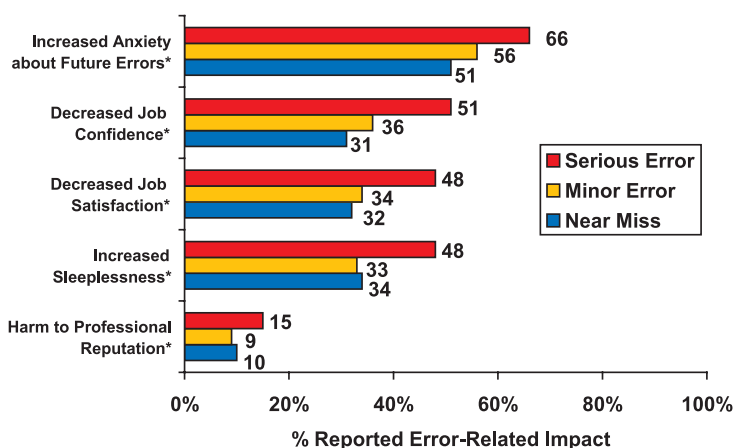## Impact of Errors on Physicians' Life Domains by Level of Error Severity*

Figure 1. *Physicians' lives were more likely to be affected as error severity increased.* * *Chi-square tests; p < .001 level.*

DISCLOSURE OF ERRORS TO PATIENTS

Of all surveyed physicians, 89% reported ever having disclosed a serious error to a patient, and 54% reported having disclosed a minor error to a patient in the last 12 months. It is unknown how many errors were disclosed by another member of the health care team. Of the physicians who had ever disclosed a serious error, 85% were satisfied with how the disclosure conversation went with the patient. Of those who had disclosed a minor error, 93% were satisfied with how the disclosure conversation went.

Only 18% of the physicians had received education or training on disclosing errors to patients. Overall, 86% were somewhat or very interested in receiving such education or training.

PHYSICIANS MOST AFFECTED BY ERRORS

Multivariate modeling revealed that some doctors reported more job-related stress following errors than others (Table 2, page 472). Physicians who spent more than 75% of their time in clinical practice (OR = 2.20, 95% CI = 1.60, 3.01), and female physicians (OR = 1.91, 95% CI = 1.21, 3.02) were more likely to report stress after a serious error than other physicians. There were no clinically meaningful stress differences after near misses or minor errors explained by demographic or practice characteristics.

Disclosure of errors to patients was also associated with job-related stress. Compared with physicians who had never disclosed an error, physicians who were dissatisfied with how their past serious error disclosure went were four times more likely to report stress after serious errors (OR = 3.86, 95% CI = 1.66, 9.00), and physicians who had disclosed a minor error reported more stress after minor errors or near misses (OR = 1.49, 95% CI = 1.12, 1.98).

Finally, physicians who thought that their likelihood of being sued was higher and who felt unsupported after errors were also more likely to report stress after serious and minor errors. When physicians' malpractice risk assessments were dichotomized the mean, physicians who thought that they had greater than a 5% chance of being sued for malpractice in the next year were 2.28 times more likely to report job-related stress after serious errors (95% CI = 1.50, 3.48) and 1.55 times more likely to report stress after near misses and minor errors (95% CI = 1.06, 2.26) compared with physicians who perceived their malpractice risk to be lower. Among those who had only been involved with near misses or minor errors, physicians also reported significantly more error-related stress if they did not agree that hospitals and health care organizations supported physicians adequately with stress related to errors (OR = 1.95, 95% CI = 1.29, 2.97).

Discussion

"There are two sets of victims after a system failure or human error has led to injury, and we have not done a good job of helping either. The first group of victims is patients and their families; the second is the health care workers involved in the incident." [33(p. 344)]

The culture of medicine requires that physicians manage substantial stress[34] and assume responsibility when something goes wrong with a patient's care. Although smaller studies have demonstrated that physicians, like patients, can be negatively affected after medical errors, this study reveals that the impact of medical errors on practicing physicians in two countries is substantial.

	Physicians Involved in Only Near Misses or Minor Errors* Reporting Increased Distress	Physicians Involved in Serious Errors† Reporting Increased Distress
DEMOGRAPHIC FACTORS		
Female Physicians	N/A‡	1.91 (1.21, 3.02)
Physicians who spent >75% of time in clinical practice	1.45 (1.08, 1.94)	2.20 (1.60, 3.01)
ATTITUDES ABOUT ERRORS/DISCLOSURE		
Physicians who disagreed with the statement, "hospitals support physicians adequately in coping with stress related to errors"	1.95 (1.29, 2.97)	N/A
Physicians who thought the chances are that they would be named in a malpractice suit to be $\geq$ 5% in the next year (vs. < 5%)	1.55 (1.06, 2.26)	2.28 (1.50, 3.48)
PAST EXPERIENCE WITH ERRORS		
Physicians who had disclosed a serious or minor error to a patient (vs. not disclosing)	1.49 (1.12, 1.98)	N/A
Physicians who were dissatisfied with how their past serious error disclosure went (vs. not disclosing)	N/A	3.86 (1.66, 9.00)
Physicians who were satisfied with how their past serious error disclosure went (vs. not disclosing)	N/A	1.13 (0.70, 1.83)

Table 2. Factors Associated with Increased Distress Following Errors Among Physicians Involved in Either Near Misses/Minor Errors or Serious Errors

* c-statistic = .61, Hosmer Lemeshow goodness of fit, p = .39

† c-statistic = .67, Hosmer Lemeshow goodness of fit, p = .99

‡ Although significant at the univariate level for one of the two models, variable listed as not applicable (N/A) either dropped out of the multivariate model or were not relevant to the final model (that is, past serious error disclosure variables for the near miss/minor errors model).

Approximately half of the almost 3,000 physicians surveyed reported that their involvement in medical errors increased their job-related stress. One in three physicians involved only with near misses also reported that their lives were negatively affected, indicating that physician distress after errors is not limited to the occurrence of serious errors.

Physicians overwhelmingly reported that health care organizations do not adequately support them in coping with error-related stress. In other studies, physicians have reported that after errors they needed someone to talk to about their mistakes, validate their decision-making process, and reassure them of their self-worth.[8–10] For many physicians, support following errors takes the form of

receiving forgiveness for the error from the patient, other health care professionals, and themselves.[8,35] Unfortunately, because psychological research has shown that forgiveness is less likely when the severity of harm is high,[7,36,37] social support in the workplace can be lacking when an error results in patient death or serious health complications.[10,38,39] Anecdotal evidence from other studies has depicted organizational response after errors to be threatening, ostracizing, and unhelpful.[9,11] Without adequate support following errors, physicians may use ineffective coping strategies, including blaming the patient or other members of the health care team, hiding the mistake, or pretending that nothing has happened.[9,11,40,41] Also, the stress of medical errors may further exacerbate physicians' already increased risk of depression,[42] alcohol or drug abuse,[31,43–46] and suicide.[43–47]

Although more than 80% of physicians expressed interest in counseling after serious errors, many also agreed that a variety of barriers might prevent them from seeking it out. Hospitals and other health care organizations should consider broadening the array of formal and informal sources of error-related support available to physicians during and after work hours. Critical incident stress debriefing,[48,49] telephone or in-person counseling with therapists or physicians with personal experience with medical errors,[50] and discussion of how physician leaders coped after their own error experiences send an institutional message that seeking support after errors is not a sign of weakness. Educating physicians that their therapeutic conversations are generally protected from discovery in the event of a lawsuit may also reduce physicians' concerns about seeking counseling after errors. Finally, physician support following near misses or minor errors should also be made available. BJC HealthCare's Support our Staff (SOS) program supports health professionals involved in medical errors in several ways (Sidebar 1, right).

Certain groups of physicians in this study, including female physicians and physicians perceiving themselves to be at higher risk of being sued for malpractice, were more likely to report that their lives were negatively affected by errors. Other research has shown that female physicians,[1,51,52] especially those in male-dominated specialties like surgery,[1] have less access to supportive role models[52] and report higher levels of job-related stress and burnout[53] compared to male physicians. However, it is unknown

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Sidebar 1. Organizational Approaches to Supporting Staff After Medical Errors

BJC HealthCare's Support our Staff (SOS) program, administered through the Employee Assistance Program (EAP), supports health professionals involved in medical errors in several ways:

Group Staff Debriefing After a Medical Error

- The department head contacts EAP to seek support for all staff involved with a medical error, including physicians.
- Counselors lead a group debriefing to normalize staff's reactions to the error, share feelings, and assess the error's impact on staff (whether staff are having nightmares, losing their appetites, using alcohol, or are depressed or anxious).
- Those needing additional support schedule no-cost telephone or in-person counseling sessions with the therapist involved in the debriefing.

Health Professional Personally Seeks EAP Assistance

- After being involved in an error, a health professional calls EAP directly. Although information revealed in therapy is protected, the counselor lets the health professional choose what to reveal about the cause of the error and who was to blame.
- EAP counselors assess the error's impact on the health professional. Telephone or in-person counseling sessions are established as needed.
- The counselor recommends that the health professional return after the root cause analysis to process what happened.

Root Cause Analysis (RCA) Preparation and Debriefing

- Health professionals involved in RCA can feel blamed for the error. Discussion with a counselor beforehand about what will happen during a root cause analysis, the purpose for the probing questions, and how not to take it personally can help staff cope and communicate more clearly during the process.
- After the RCA, counselors are available to help professionals process what happened.

Professionals using these services have reported that they felt less alone after an error and more prepared for the root cause analysis.

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whether these gender differences in error-related stress reflect a greater willingness of female physicians to openly report their distress or actual elevated distress levels beyond that of male physicians. Also, United States physicians and those in private practice, who actually do face higher malpractice insurance costs, were not significantly more distressed after errors than Canadian physicians or those practicing at academic institutions. Helping physicians understand their true malpractice risk may, therefore, reduce some error-related stress. Future research should continue to explore how distress after errors varies by physician demographic and practice characteristics so that support can be targeted to those most affected.

This study also suggests that disclosing errors to patients is one source of physician distress.[8–10,16,25,54–57] Error disclosure is certainly difficult, requiring that physicians acknowledge their own shortcomings or the limitations of the health care delivery system and face the possible loss of patient trust and a malpractice lawsuit.[35,54] Physicians in this study who disclosed errors to patients were generally satisfied with how the conversation went. Although some proponents of error disclosure believe that disclosure can provide psychological relief for physicians, this study found that physicians who were satisfied with their disclosure to a patient were no less distressed than physicians who did not disclose. However, when disclosure with patients goes poorly, physicians are four times more likely to report increased job-related stress. To lessen the chance of disclosure going poorly, patient safety specialists and risk managers could assist physicians in planning disclosures, be present when disclosure occurs to respond to patient questions, debrief with the physician afterwards, and provide professional reaffirmation and support for the physicians.[58] Finally, because most physicians were interested in, but had not received, formal error disclosure training, improved access to such training also may reduce the chances of disclosure going poorly.

A sensitive study of errors' impact on physicians requires multiple scientific approaches, with each approach having limitations. Although this is the largest study of how medical errors affect practicing physicians to date, this broad approach limited the number and type of questions that could be asked. Although this study identified key sources of variation in physician distress after errors, our observed model c-statistics (.61 and .67) indicate that additional research is still needed that uses standard psychological measures of depression and burnout and that measures personality variables that affect how physicians cope and other practice and organizational characteristics not examined. Because the data report physicians' experiences with medical errors across multiple years in practice, we also could not identify one particular error in which a physician was involved and its subsequent impact on distress. However, the validity of these general findings is supported by similar reports of increased depression and burnout found in a prospective longitudinal study of residents after a specific medical error using established psychological measures.[13] Finally, because 8% of physicians did not believe they had been involved with a near miss, minor error, or serious error in their careers, a study to determine whether certain physicians are actually error free or are defining events in which they were involved as something other than errors is still needed.

The patient safety movement has proposed that a cultural shift in medicine occur so that errors are seen as system rather than individual failures and as a community problem shared jointly by all medical professionals.[22] Although important, this cultural shift towards a blame-free culture is unlikely to stop physicians from being upset after errors or stop patients from directing their anger and lawsuits at individual health care providers. After a medical error, it is appropriate that most attention is directed at meeting the physical and emotional needs of the affected patient. Yet this study suggests that physicians also may experience significant emotional distress and job-related stress following errors that, at present, go largely unaddressed. Only when health care institutions commit resources to patients, physicians, and other involved hospital staff can all those negatively affected by medical errors receive the support they need. **J**

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