

US and Canadian Physicians' Attitudes and Experiences Regarding Disclosing Errors to Patients

Thomas H. Gallagher, MD; Amy D. Waterman, PhD; Jane M. Garbutt, MB, ChB, FRCP; Julie M. Kapp, MPH, PhD; David K. Chan, MD; W. Claiborne Dunagan, MD; Victoria J. Fraser, MD; Wendy Levinson, MD

Background: Patients are often not told about harmful medical errors. The malpractice environment is considered a major determinant of physicians' willingness to disclose errors to patients. Yet, little is known about the malpractice environment's actual effect on physicians' error disclosure attitudes and experiences.

Methods: Mailed survey of 2637 physicians (62.9% response rate) in the United States (Missouri and Washington) and Canada, countries with different malpractice environments.

Results: Physicians' error disclosure attitudes and experiences were similar across country and specialty. Of the physicians, 64% agreed that errors are a serious problem. However, 50% disagreed that errors are usually caused by system failures. Ninety-eight percent endorsed disclosing serious errors to patients and 78% supported disclosing minor errors; 74% thought disclosing a serious error would be very difficult. Fifty-eight per-

cent had disclosed a serious error to a patient, and 85% were satisfied with the disclosure, and 66% agreed that disclosing a serious error reduces malpractice risk. Respondents' estimates of the probability of lawsuits were not associated with their support for disclosure. The belief that disclosure makes patients less likely to sue (odds ratio, 1.58), not being in private practice (odds ratio, 1.47), being Canadian (odds ratio, 1.43), and being a surgeon (odds ratio, 1.26) were independently associated with higher support for disclosing serious errors.

Conclusions: US and Canadian physicians' error disclosure attitudes and experiences are similar despite different malpractice environments, and reveal mixed feelings about disclosing errors to patients. The medical profession should address the barriers to transparency within the culture of medical and surgical specialties.

Arch Intern Med. 2006;166:1605-1611

Author Affiliations:

Departments of Medicine and Medical History and Ethics, University of Washington School of Medicine, Seattle (Dr Gallagher); Department of Medicine, Washington University School of Medicine (Drs Waterman, Garbutt, Dunagan, and Fraser), Waterman Research Solutions (Dr Kapp), and BJC HealthCare (Dr Dunagan), St Louis, Mo; and Department of Medicine, The University of Toronto, Toronto, Ontario (Drs Chan and Levinson).

EFFORTS ARE BEING LAUNCHED around the world to enhance patient safety. Following the US Institute of Medicine report, *To Err Is Human: Building a Safer Health System*,¹ England, Australia, New Zealand, and Canada also identified adverse events and errors as a major health problem.²⁻⁵ In addition, standards that promote open communication with patients following such events are rapidly emerging. In the United States, hospital accreditation standards and some state laws require that patients be told about "unanticipated outcomes,"^{6,7} and Senators Barack Obama and Hillary Rodham Clinton introduced legislation requiring harmful errors be disclosed to patients.⁸ Programs to enhance communication with patients following adverse events and errors also have been recently implemented in the United Kingdom and Australia.^{9,10} However, studies^{5,11-14} in multiple countries suggest that as little as 30%

of harmful errors may be disclosed to patients. Failing to communicate effectively with patients following errors could reduce patient trust in physicians' integrity and may increase the likelihood of a lawsuit.^{15,16}

See also page 1585

Many have suggested that the malpractice environment (ie, the frequency of malpractice claims and the availability of affordable malpractice insurance) is a major obstacle to disclosing harmful errors to patients.¹⁷⁻¹⁹ The malpractice environment can vary considerably among countries. Malpractice lawsuits are a special concern in the United States, where physicians cope with escalating premiums and loss of insurability.²⁰ Canadian physicians practice in a much less litigious environment. While Canada shares the US fault-based malpractice model, tort reforms and other systemic legal differ-

Table 1. Definitions Provided to Respondents

| Term | Definition |
|---------------|---|
| Adverse event | An injury that was caused by medical management rather than the patient's underlying disease. |
| Medical error | The failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Medical errors include serious errors, minor errors, and near misses. |
| Serious error | Error that causes permanent injury or transient but potentially life-threatening harm. |
| Minor error | Error that causes harm which is neither permanent nor potentially life threatening. |
| Near miss | An error that could have caused harm but did not, either by chance or timely intervention. |

ences (such as rare use of contingency fees or punitive damages) result in Canadian physicians being sued approximately one quarter as frequently as their US counterparts and paying much lower premiums.²¹⁻²³

Comparing physicians' opinions about error disclosure and patient safety across countries could clarify whether these attitudes stem from country-specific issues, such as the malpractice environment. Furthermore, the malpractice environment differs depending on physicians' specialties. In the United States and Canada, malpractice premiums are considerably higher for surgeons. To our knowledge, prior studies^{11,18,19} have not compared physicians' disclosure or safety attitudes in different countries or by specialties. Therefore, we surveyed 2637 physicians in the United States and Canada to determine the following: (1) physicians' attitudes about disclosing errors to patients and patient safety, (2) whether these attitudes differ between the United States and Canada and between medical and surgical specialties, and (3) what factors beyond country and specialty are associated with physicians' willingness to disclose serious errors to patients.

METHODS

We mailed surveys to 4568 physicians in the United States and Canada. In the United States, surveys were mailed to all 2168 clinically active attending physicians in internal medicine (general medicine and all subspecialties, n=1365), family medicine (n=209), and surgery (general surgery and all subspecialties, n=594) at Washington University School of Medicine/BJC HealthCare, University of Washington School of Medicine, and Group Health Permanente, Seattle. Missouri and Washington are 2 of the 18 US states whose malpractice environment is reported to be "in crisis" because of limited availability of affordable professional liability insurance.²⁰ These specific institutions were studied because the investigators' preexisting relationships with them facilitated an adequate response rate and because they provided geographic diversity and a mixture of academic and private physicians. Of these 2168 US physicians, 173 were ineligible, leaving 1995 eligible US physicians.

In Canada, surveys were mailed to a nationally representative random sample of 2400 English-speaking practicing physicians in internal medicine (general medicine and all subspecialties, n=1200) and surgery (general surgery and all subspecialties, n=1200). The Canadian sample was drawn from the Canadian Medical Directory, which includes all physi-

cians in active clinical practice in Canada. Of these 2400 Canadian physicians, 202 were ineligible, leaving 2198 eligible Canadian physicians.

SURVEY CONTENT

The survey used the US Institute of Medicine definitions of *adverse event*, *medical error*, and *near miss*, the most commonly used definitions for these terms.¹ We developed our own definitions of *serious error* and *minor error* (**Table 1**). These definitions were repeated on each survey page, and key terms were capitalized or boldfaced throughout. The survey was pilot tested with practicing physicians, and cognitive interviews were conducted to ensure key terms were clearly understood.

Questions about error disclosure included what types of errors should be disclosed, barriers to disclosure, and respondents' experience with disclosure. To assess attitudes about the malpractice environment, respondents were asked to estimate the likelihood of a malpractice suit in the next year. Respondents' beliefs about the relationship between disclosure and malpractice were measured by asking whether disclosing a serious error would make the patient less likely to sue and whether the possibility of a lawsuit might reduce their willingness to disclose. Agreement was measured on a 4-point Likert scale (from "strongly disagree" to "strongly agree").

SURVEY IMPLEMENTATION

This anonymous survey was conducted between July 2003 and March 2004, and was approved by the participating institutional review boards. Informed consent was implied by returning the survey. We encouraged participation through repeated mailings and telephone, facsimile, and e-mail reminders. Token incentives, including a \$5 coffee card and a lottery for dinner at a local restaurant, were also used in the United States. Financial incentives were not used in Canada.

STATISTICAL ANALYSIS

The relationship of respondents' attitudes to country and specialty was analyzed using logistic regression (dichotomous outcomes) or fixed-effects modeling (continuous outcomes) in the 4 physician groups (US medicine, US surgery, Canadian medicine, and Canadian surgery). In the analysis, we chose 2 variables to represent the malpractice environment's effect on respondents' attitudes: respondents' country and estimate of the probability of malpractice. Questions that used 4-point Likert response scales were dichotomized at the midpoint (agree vs disagree) with the exception of the question "serious errors should be disclosed to patients." Based on prior research and review of the literature,^{24,25} we expected that disclosure of serious errors would be endorsed by virtually all physicians. Therefore, this variable was dichotomized at strongly agree vs all others.

Factors independently predicting whether physicians strongly agreed that serious medical errors should be disclosed were evaluated using hierarchical logistic regression, starting with the physician group variable (country or specialty) and then including additional variables. Age, years of training, and practice type were included a priori as adjustment variables. The final model was examined for clustering of physician attitude by hospital, with no significant change. Therefore, the results of the unclustered analysis are reported. Analyses were performed using SAS statistical software, version 8 (SAS Institute Inc, Cary, NC), except for the clustered analysis, which used Stata software, version 8 (StataCorp LP, College Station, Tex).

CHARACTERISTICS OF RESPONDENTS

Surveys were completed by 2637 (62.9%) of 4193 eligible physicians (**Table 2**). Respondents and nonrespondents did not differ by country or sex. The response rate of surgical specialists was slightly higher than that of medical specialists (64.5% vs 60.1%; $P=.01$). In the United States, respondents were more likely to be in academic practice than nonrespondents (33% vs 29%; $P=.002$). Practice type was not available for Canadian nonrespondents.

PATIENT SAFETY EXPERIENCES AND ATTITUDES

Of the physicians, 62% reported involvement in a near miss, 73% in a minor error, and 55% in a serious error; 5% reported no prior involvement with any near misses, minor errors, or serious errors. While involvement in a serious error was reported slightly more often by US than Canadian physicians (odds ratio [OR], 1.2; 95% confidence interval [CI], 1.02-1.43), a stronger specialty difference was present (OR for surgical specialists, 1.5; 95% CI, 1.3-1.8).

Of the physicians, 64% agreed that "medical errors are one of the most serious problems in health care," with no country or specialty variation. Physicians were divided on whether "medical errors are usually caused by failures of care delivery systems, not the failure of individuals," with 50.4% agreeing and 49.6% disagreeing. No country difference existed, but medical specialists were more likely than surgical specialists to agree (OR, 1.7; 95% CI, 1.4-2.0).

MEDICAL MALPRACTICE ATTITUDES

Attitudes about the malpractice environment varied by country and specialty. Respondents overall estimated that 8% of physicians in their specialty would be sued in the next year (**Table 3**). US physicians thought lawsuits were 1.5 times more likely than did Canadian physicians (9.4% vs 6.4%; $P<.001$), and surgical specialists believed lawsuits were 1.6 times more likely than medical specialists (10.1% vs 6.2%; $P<.001$). Regarding the relationship between disclosure and malpractice, 66% agreed that disclosing serious errors made lawsuits less likely. Canadian physicians were somewhat more likely to agree with this statement than US physicians (OR, 1.3; 95% CI, 1.1-1.5), and medical specialists were more likely to agree than surgical specialists (OR, 1.5; 95% CI, 1.3-1.8).

ATTITUDES AND EXPERIENCES WITH ERROR DISCLOSURE

Physicians' willingness to disclose errors to patients increased with the error's harm (**Table 4**). Of the physicians, 35% endorsed disclosing near misses, a belief held more commonly by Canadians (OR, 1.8; 95% CI, 1.5-2.1) and medical specialists (OR, 1.5; 95% CI, 1.2-1.8).

Table 2. Characteristics of the 2637 Respondents*

| Characteristic | US Respondents (n = 1233) | Canadian Respondents (n = 1404) |
|--------------------------------------|---------------------------|---------------------------------|
| Response rate† | 61.8 | 63.9 |
| Specialty | | |
| Family practice | 18.2 | 0 |
| Medicine | 53.2 | 46.7 |
| Surgery | 25.5 | 53.3 |
| Not listed | 3.1 | 0 |
| Practice type | | |
| Private | 41.1 | 50.7 |
| Academic | 32.9 | 38.9 |
| Other | 17.6 | 4.8 |
| Not listed | 8.4 | 5.6 |
| Age, y‡ | 48.1 (9.03) | 50.2 (10.10) |
| Time in practice, y‡ | 15.8 (9.40) | 17.7 (10.31) |
| % Of time spent in clinical practice | | |
| 1-25 | 8.9 | 4.3 |
| 26-50 | 9.1 | 9.1 |
| 51-75 | 16.7 | 20.6 |
| 76-100 | 57.2 | 64.6 |
| Not listed | 8.1 | 1.4 |
| Sex | | |
| Male | 72.3 | 84.2 |
| Female | 23.1 | 14.7 |
| Not listed | 4.6 | 1.1 |

*Data are given as percentage of each group unless otherwise indicated.
†For US respondents, this rate was based on 1233 respondents of 1995 total possible; and for Canadian respondents, 1404 respondents of 2198 total possible.

‡Data are given as mean (SD).

Of the physicians, 78% supported disclosing minor errors, with no country or specialty variation. Nearly all (98%) agreed that serious errors should be disclosed; 74% agreed that disclosing a serious error would be very difficult, a belief endorsed by slightly more US physicians (OR, 1.2; 95% CI, 1.0-1.5). A stronger specialty difference existed, with medical specialists more likely to agree that disclosure was difficult than surgical specialists (OR, 1.6; 95% CI, 1.3-1.9).

Despite agreeing that serious errors should be disclosed, many physicians acknowledged that certain factors might make them less likely to actually disclose. Of the physicians, 60% reported they might be less likely to disclose if they "think the patient would not understand what I was telling him or her." Other factors that physicians reported might inhibit disclosure included "if I think the patient would not want to know about the error" (30%), "if the patient is unaware that the error happened" (21%), "if I think I might get sued" (19%), "if I didn't know the patient very well" (13%), and "if I think the patient would become angry with me if I did so" (10%). Only 23% did not report that any of these barriers would make them less likely to disclose a serious error to a patient.

Of the physicians, 58% reported having disclosed a serious error to a patient, with no country variation (Table 4). Surgical specialists were 1.7 times (95% CI, 1.4-2.0 times) more likely to have disclosed a serious error than medical specialists. Most physicians who had

Table 3. Attitudes Regarding Malpractice*

| Statement | Overall | United States | | Canada | |
|---|---------|---------------|---------|----------|---------|
| | | Medicine | Surgery | Medicine | Surgery |
| For every 100 physicians in your specialty, how many do you think will be sued for malpractice in the next year?† | 8 (10) | 8 (9) | 14 (15) | 4 (5) | 8 (9) |
| What do you think the chances are that you will be named in a malpractice suit in the next year?† | 7 (12) | 6 (10) | 13 (20) | 4 (8) | 7 (12) |

*Data are given as mean (SD) percentage of respondents.

† $P < .05$ for the country and specialty difference.

Table 4. Attitudes and Experiences Regarding Error Disclosure

| Statement | Overall | United States | | Canada | |
|--|------------|---------------|------------|------------|------------|
| | | Medicine | Surgery | Medicine | Surgery |
| NEAR MISSES should be disclosed to patients*† | 35 (6 SA) | 32 (6 SA) | 22 (2 SA) | 42 (8 SA) | 36 (6 SA) |
| MINOR errors should be disclosed to patients* | 78 (14 SA) | 77 (14 SA) | 76 (10 SA) | 79 (14 SA) | 79 (15 SA) |
| SERIOUS errors should be disclosed to patients*‡ | 98 (55 SA) | 98 (49 SA) | 98 (54 SA) | 98 (59 SA) | 97 (61 SA) |
| Disclosing a SERIOUS error to a patient would be very difficult*† | 74 | 79 | 70 | 75 | 67 |
| Which of the following factors might make it less likely that you would disclose a SERIOUS error to a patient?§ | | | | | |
| If I think the patient would not understand what I was telling him or her | 60 | 61 | 58 | 65 | 55 |
| If I think the patient would not want to know about the error | 30 | 32 | 25 | 32 | 28 |
| If the patient is unaware that the error happened | 21 | 24 | 21 | 20 | 19 |
| If I think I might get sued† | 19 | 27 | 15 | 20 | 10 |
| If I didn't know the patient very well† | 13 | 20 | 9 | 15 | 6 |
| If I think the patient would become angry with me if I did so | 10 | 13 | 8 | 12 | 6 |
| Have you ever disclosed a SERIOUS error to a patient?§ | 58 | 53 | 66 | 53 | 65 |
| How satisfied were you with how this disclosure conversation went? (% somewhat or very satisfied) | 85 | 84 | 85 | 86 | 85 |
| How did disclosing this error impact your relationship with the patient? (% no change, somewhat, or very positive) | 74 | 77 | 65 | 80 | 71 |
| I experienced relief after disclosing this error to the patient (% agree)† | 74 | 78 | 60 | 77 | 75 |

Abbreviation: SA, strongly agree.

*Data are given as percentage of each group that agrees with the statement. "Agree" denotes those who agree plus those who strongly agree.

† $P < .05$ for both country and specialty difference.

‡ $P < .05$ for US vs Canada difference.

§Data are given as percentage of each group that responded "yes" to the statement.

|| $P < .05$ for medicine vs surgery difference.

disclosed a serious error reported being either very (38%) or somewhat (47%) satisfied with the disclosure conversation, with no variation by country or specialty; 74% reported they "experienced relief" after disclosure.

WHAT PREDICTS WILLINGNESS TO DISCLOSE SERIOUS ERRORS TO PATIENTS?

Factors that independently predict strongly agreeing that serious errors should be disclosed to patients are presented in **Table 5**. Physicians' estimate of the probability of being sued, a key marker of the malpractice environment, did not affect respondents' beliefs about disclosure. For example, 54% of physicians whose estimate of the likelihood of malpractice was in the highest quartile strongly agreed that serious errors should be disclosed, compared with 57% of physicians in the lowest quartile ($P = .64$). This variable was, therefore, not included in subsequent modeling steps. The other marker

of the malpractice environment, respondents' country, was modestly associated with strongly supporting disclosing serious errors; Canadian physicians were somewhat more likely than US physicians to strongly support disclosure (OR, 1.4 [95% CI, 1.2-1.7]). Surgeons were somewhat more likely than medical specialists to strongly support disclosure of serious errors (OR, 1.3 [95% CI, 1.02-1.55]).

Respondents' beliefs about the relationship between disclosure and malpractice were among the factors that independently predicted stronger support for disclosing serious errors. Physicians were more likely to strongly endorse disclosure if they agreed that disclosure made patients less likely to sue (OR, 1.6 [95% CI, 1.3-1.9]) and were less likely to strongly endorse disclosure if they reported that concern about a lawsuit might reduce their willingness to disclose (OR, 0.5 [95% CI, 0.3-0.6]). Physicians were also less likely to endorse disclosure if they were in private practice (OR, 0.7 [95% CI, 0.6-0.8]) and

if they thought disclosure would be difficult (OR, 0.76 [95% CI, 0.61-0.95]). The belief that medical errors are usually caused by failures of care delivery systems was not independently associated with strongly supporting the need to disclose serious errors to patients. The final model showed good fit (Hosmer-Lemeshow $P=$.52; C statistic, 0.69).

COMMENT

Physicians' participation is essential to the success of initiatives seeking full disclosure of harmful medical errors to patients and improvements in patient safety.²⁶ This study, the first to our knowledge to explore physicians' patient safety attitudes in countries with different malpractice environments, reveals that physicians across countries and specialties have mixed feelings about disclosing harmful errors to patients and about important safety concepts. Furthermore, US and Canadian physicians' beliefs and reported practice were quite similar, implying that the malpractice environment may not be the major determinant of these attitudes and experiences.

Physicians' attitudes about disclosing harmful errors to patients include support for the overall concept of disclosure and hesitance regarding implementation. While physicians endorsed disclosing serious errors, they also acknowledged that many factors might inhibit disclosure. In addition, 22% disagreed with the need to disclose minor errors to patients (ie, errors causing harm that is neither permanent nor life threatening). Standards do not absolve physicians from disclosing less harmful errors.^{3,7} Patients already lack confidence that they will be told about medical errors.^{13,15,25} Physicians' hesitance to actually disclose harmful errors could further erode patients' trust.

The malpractice environment was not the overwhelming determinant of physicians' attitudes about error disclosure in this study. While malpractice pressures in Canada are increasing, Canada's malpractice system remains the envy of US tort reform advocates.^{21,23} Canadian malpractice cases are heard by a judge rather than a jury, the contingency fee system is unusual, pain and suffering damages are capped, punitive damages are rare, and losers pay the winners' legal fees.²⁷ Yet, Canadian physicians, despite believing the chance they would be sued was half that estimated by US physicians, were only somewhat more supportive of disclosing serious errors and no more willing to disclose minor errors than US physicians. Furthermore, Canadian physicians were no more likely to report having disclosed a serious error to a patient than US physicians, and physicians in both countries were equally satisfied with their most recent disclosure conversation. The US and Canadian health care delivery systems differ in other ways beyond their malpractice environments.^{28,29} Nevertheless, we believe our findings suggest that US tort reform, while potentially desirable for other reasons, may have limited effect on physicians' disclosure attitudes and practices.

The fact that US and Canadian physicians' attitudes transcend country boundaries suggests that these beliefs may relate to the norms, values, and practices that constitute

Table 5. Logistic Regression Modeling Strong Agreement That Serious Errors Should Be Disclosed to Patients

| Variable | OR (95% CI) |
|--|------------------|
| Physician group | |
| Country (Canada vs United States) | 1.43 (1.17-1.74) |
| Specialty (surgery vs medicine) | 1.26 (1.02-1.55) |
| Attitudes about the relationship between disclosure and malpractice | |
| Disclosing a serious error would make it less likely that a patient would sue me (agree) | 1.58 (1.29-1.94) |
| It might make me less likely to disclose a serious error to a patient if I think I might get sued (yes) | 0.45 (0.34-0.59) |
| Attitudes about patient safety | |
| Medical errors are one of the most serious problems in health care (agree) | 1.22 (1.01-1.48) |
| Medical errors are usually caused by the failure of care delivery systems, not the failure of individuals (agree) | 1.19 (0.99-1.44) |
| Attitudes about disclosure | |
| Disclosing a serious error would damage a patient's trust in my competence (agree) | 1.04 (0.85-1.27) |
| Disclosing a serious error to a patient would be very difficult (agree) | 0.76 (0.61-0.95) |
| Endorsement of potential factors that might decrease willingness to disclose* | 0.86 (0.78-0.94) |
| Prior experience with disclosure | |
| Personally involved in a near miss or minor error (yes) | 0.90 (0.68-1.20) |
| Personally involved in a serious error (yes) | 1.17 (0.92-1.49) |
| Personally involved in no error (yes) | 0.59 (0.35-1.01) |
| I experienced relief after disclosing this error to the patient (vs disagree plus never disclosed a serious error) | 1.23 (0.97-1.54) |
| Additional demographic characteristics | |
| Private practice | 0.68 (0.56-0.82) |
| Time (years) in practice | 0.99 (0.97-1.01) |
| Age \times sex interaction | 0.10 |

Abbreviations: CI, confidence interval; OR, odds ratio.

*Composite variable representing number of "yes" responses to the following question: "Which of the following factors might make it less likely that you would disclose a serious error to a patient: (a) if the patient is unaware that the error happened, (b) if I think the patient would not want to know about the error, (c) if I think the patient would become angry with me if I did so, (d) if I didn't know the patient very well, or (e) if I think the patient would not understand what I was telling him or her."

the culture of medicine.^{30,31} The medical education system, a potent force for professional socialization, is remarkably similar in both countries. While acculturation begins in medical school, the most critical cultural norms are inculcated within specialties.³² The finding that physician attitudes generally varied more by specialty than by country further supports the role of medical culture in shaping these views. Specialties' ability to communicate cultural norms gives them unique power to engage physicians in efforts to improve error disclosure and patient safety. The certification process provides one vehicle for specialty boards to promote such culture change by holding their members accountable for understanding key error disclosure and patient safety concepts.

While the malpractice environment did not significantly influence physicians' disclosure attitudes or practices, physicians' individual beliefs about malpractice did affect their support for disclosing serious errors. In both

countries, physicians who believed that disclosure decreased malpractice risk were considerably more supportive of disclosure. However, US and Canadian physicians were almost equally likely to hold this belief. In addition, physicians who reported that fear of a lawsuit would reduce their willingness to disclose were also less supportive of disclosure. Accumulating evidence suggests that disclosure may indeed reduce the probability of malpractice lawsuits and reduce the size of jury awards.^{15,33-35} Additional research should clarify this complex relationship between the malpractice environment, physicians' individual beliefs about malpractice, and the disclosure of harmful errors to patients.

The medical profession has focused on the malpractice environment as the primary obstacle to improving the disclosure of errors to patients.^{26,36} This study highlights how factors beyond the malpractice environment influence physicians' willingness to disclose serious errors. Being in private practice had an independent effect on disclosure attitudes that was comparable to the impact of respondents' country and greater than their specialty, controlling for malpractice attitudes. Disclosure may pose special challenges for private physicians for reasons beyond fear of malpractice. Private physicians may not have ready access to disclosure resources available at large health care institutions, such as just-in-time disclosure coaching.³⁷ In addition, physicians who thought disclosure was difficult were less supportive of disclosure. Training physicians in disclosure could enhance physicians' confidence in conducting these difficult conversations.³⁸

Safety advocates hope their contention that most errors stem from defective systems will reduce the culture of blame and facilitate open discussion about errors.^{1,39} Half of our study's respondents agreed with this assertion, while half did not, suggesting this concept may not be fully understood or resonate with physicians' experiences.⁴⁰ In addition, physicians who agreed that medical errors are usually caused by failures of care delivery systems were not more likely to support disclosing serious errors to patients. Physician uncertainty about system-based solutions to patient safety problems was also suggested in the survey by Blendon et al.¹¹ Physicians may believe the safety movement has overstated its case and that for some errors system failures play a modest role, if any. Creating educational programs that address such concerns may promote improved physician involvement in safety programs.

This study has several limitations. While we used standard US Institute of Medicine definitions for medical errors and adverse events, it can be difficult in practice to know whether an adverse event was caused by a medical error.¹⁶ While our response rate was robust, nonresponse bias may have affected our results. In addition, the US physicians were located in only 2 states, potentially affecting generalizability. However, the malpractice environment in both states is in crisis, increasing our ability to examine the malpractice environment's effect on physicians' attitudes.²⁰ While we did not ask physicians about their personal malpractice history, we believe that the impact of prior lawsuits on error disclosure and safety attitudes would be reflected in the malpractice attitudes we measured. Social desirability bias

may have influenced physicians' reported attitudes or behaviors. However, this bias would likely lead physicians to report more positive attitudes than they actually hold. Therefore, our results may overestimate physicians' support for disclosure.

In conclusion, the medical profession should consider whether the culture of medicine itself represents a more important barrier than the malpractice environment to the disclosure of harmful medical errors to patients. Patients justifiably expect that harmful medical errors will be disclosed to them. Increasing physician engagement in efforts to communicate openly with patients following errors and to enhance patient safety could provide a much-needed boost to patients' confidence in the quality and integrity of the health care system.

Accepted for Publication: May 3, 2006.

Correspondence: Thomas H. Gallagher, MD, University of Washington School of Medicine; 4311 11th Ave NE, Suite 230, Seattle, WA 98105-4608 (thomasg@u.washington.edu).

Author Contributions: Dr Gallagher had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Financial Disclosure: None reported.

Funding/Support: This study was supported by grants 1U18HS1189801 and 1K08HS01401201 from the Agency for Healthcare Research and Quality and by the Greenwall Foundation Faculty Scholars Program.

Role of the Sponsor: The funding bodies had no role in data extraction and analyses, in the writing of the manuscript, or in the decision to submit the manuscript for publication.

Acknowledgment: We thank Alison Ebers for her tireless work throughout this project; Kerry Bommarito, MPH, Melissa Krauss, MPH, and Irene Fischer, MPH, for collecting and processing the survey data; Mary Lucas, RN, MA, for assistance with manuscript preparation; and Eric B. Larson, MD, Hugh Straley, MD, and David Flum, MD, for their support.

REFERENCES

1. Kohn LT, Corrigan J, Donaldson MS. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 2000.
2. Baker GR, Norton PG, Flintoft V, et al. The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada. *CMAJ*. 2004; 170:1678-1686.
3. Department of Health (UK). An organisation with a memory: report of an expert group on learning from adverse events in the NHS. <http://www.dh.gov.uk/assetRoot/04/06/50/86/04065086.pdf>. Accessed February 15, 2006.
4. Hussey PS, Anderson GF, Osborn R, et al. How does the quality of care compare in five countries? *Health Aff (Millwood)*. 2004;23:89-99.
5. Schoen C, Osborn R, Huynh PT, et al. Taking the pulse of health care systems: experiences of patients with health problems in six countries [published online ahead of print November 28, 2005]. *Health Aff (Millwood)*. doi:10.1377/hlthaff.W5.509. Accessed June 2, 2006.
6. Eads J. State mandates reporting of unusual incidents and medical errors. *Tenn Med*. 2002;95:239-240.
7. Joint Commission on Accreditation of Health Care Organizations. *Revisions to Joint Commission Standards in Support of Patient Safety and Medical Health Care Error Reduction*. Oakbrook, Ill: Joint Commission on Accreditation of Health Care Organizations; 2001.
8. *The National Medical Error Disclosure and Compensation Act*, 109th Cong, 1st Sess (2005). Bill S. 1784.

9. National Patient Safety Agency (UK). Safer practice notice: being open when patients are harmed: 2005. <http://www.npsa.nhs.uk/site/media/documents/1314>. Accessed June 2, 2006.
10. Australian Council for Safety and Quality in Healthcare. Open disclosure standard: 2003. http://safetyandquality.org/OpenDisclosure_web.pdf. Accessed November 9, 2005.
11. Blendon RJ, DesRoches CM, Brodie M, et al. Views of practicing physicians and the public on medical errors. *N Engl J Med*. 2002;347:1933-1940.
12. Lehmann LS, Puopolo AL, Shaykevich S, Brennan TA. Iatrogenic events resulting in intensive care admission: frequency, cause, and disclosure to patients and institutions. *Am J Med*. 2005;118:409-413.
13. The Kaiser Family Foundation/Agency for Healthcare Research and Quality/Harvard School of Public Health. National survey on consumers' experiences with patient safety and quality information: November 2004. <http://www.kff.org/kaiserpolls/upload/National-Survey-on-Consumers-Experiences-With-Patient-Safety-and-Quality-Information-Survey-Summary-and-Chartpack.pdf>. Accessed October 6, 2005.
14. Weissman JS, Annas CL, Epstein AM, et al. Error reporting and disclosure systems: views from hospital leaders. *JAMA*. 2005;293:1359-1366.
15. Mazor KM, Simon SR, Yood RA, et al. Health plan members' views about disclosure of medical errors. *Ann Intern Med*. 2004;140:409-418.
16. Witman AB, Park DM, Hardin SB. How do patients want physicians to handle mistakes? a survey of internal medicine patients in an academic setting. *Arch Intern Med*. 1996;156:2565-2569.
17. Joint Commission on Accreditation of Healthcare Organizations. Health care at the crossroads: strategies for improving the medical liability system and preventing patient injury: 2005. http://www.jcaho.org/news+room/press+kits/tort+reform/medical_liability.pdf. Accessed October 6, 2005.
18. Robinson AR, Hohmann KB, Rifkin JI, et al. Physician and public opinions on quality of health care and the problem of medical errors. *Arch Intern Med*. 2002;162:2186-2190.
19. Mello MM, Studdert DM, DesRoches CM, et al. Caring for patients in a malpractice crisis: physician satisfaction and quality of care. *Health Aff (Millwood)*. 2004;23:42-53.
20. Mello MM, Studdert DM, Brennan TA. The new medical malpractice crisis. *N Engl J Med*. 2003;348:2281-2284.
21. Coyte PC, Dewees DN, Trebilcock MJ. Medical malpractice: the Canadian experience. *N Engl J Med*. 1991;324:89-93.
22. Picard EI, Robertson GB. *Legal Liability of Doctors and Hospitals in Canada*. 3rd ed. Scarborough, Ontario: Carswell; 1996.
23. The Canadian Medical Protective Association. Annual report (2004). http://www.cmpa-acpm.ca/portal/cmpa_docs/english/resource_files/admin_docs/common/annual_reports/2004/pdf/annual_report-e.pdf. Accessed April 25, 2006.
24. American Medical Association Council on Ethical and Judicial Affairs/Southern Illinois University at Carbondale School of Law. *Code of Medical Ethics, Annotated Current Opinions: Including the Principles of Medical Ethics, Fundamental Elements of the Patient-Physician Relationship and Rules of the Council on Ethical and Judicial Affairs*. Chicago, Ill: American Medical Association; 2004.
25. Gallagher TH, Waterman AD, Ebers AG, Fraser VJ, Levinson W. Patients' and physicians' attitudes regarding the disclosure of medical errors. *JAMA*. 2003;289:1001-1007.
26. Gallagher TH, Levinson W. Disclosing harmful medical errors to patients: a time for professional action. *Arch Intern Med*. 2005;165:1819-1824.
27. Singer PA. How green is your grass? a comparative analysis of the American and Canadian health care systems. *Humane Med*. 1991;7:47-53.
28. Blendon RJ, Schoen C, DesRoches CM, Osborn R, Scoles KL, Zapert K. Inequities in health care: a five-country survey. *Health Aff (Millwood)*. 2002;21:182-191.
29. Brown LD. Comparing health systems in four countries: lessons for the United States. *Am J Public Health*. 2003;93:52-56.
30. Bosk CL. *Forgive and Remember: Managing Medical Failure*. 2nd ed. Chicago, Ill: University of Chicago Press; 2003.
31. Gawande A. *Complications: A Surgeon's Notes on an Imperfect Science*. New York, NY: Metropolitan Books; 2002.
32. Ludmerer KM. *Time to Heal: American Medical Education From the Turn of the Century to the Era of Managed Care*. New York, NY: Oxford University Press Inc; 1999.
33. COPIC. COPIC's 3R program: 2003. http://www.callcopic.com/publications/3rs/march_2004.pdf. Accessed October 6, 2005.
34. Kachalia A, Shojania KG, Hofer TP, Piotrowski M, Saint S. Does full disclosure of medical errors affect malpractice liability? the jury is still out. *Jt Comm J Qual Saf*. 2003;29:503-511.
35. Kraman SS, Hamm G. Risk management: extreme honesty may be the best policy. *Ann Intern Med*. 1999;131:963-967.
36. Studdert DM, Mello MM, Brennan TA. Medical malpractice. *N Engl J Med*. 2004;350:283-292.
37. American Society for Healthcare Risk Management. *Disclosure: What Works Now & What Can Work Even Better*. Chicago, Ill: American Hospital Association; 2004.
38. Chan DK, Gallagher TH, Reznick R, Levinson W. How surgeons disclose medical errors to patients: a study using standardized patients. *Surgery*. 2005;138:851-858.
39. Leape LL, Berwick DM. Five years after To Err Is Human: what have we learned? *JAMA*. 2005;293:2384-2390.
40. Goode LD, Clancy CM, Kimball HR, Meyer G, Eisenberg JM. When is "good enough"? the role and responsibility of physicians to improve patient safety. *Acad Med*. 2002;77:947-952.