

Reporting and Disclosing Medical Errors

Pediatricians' Attitudes and Behaviors

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Objective: To characterize pediatricians' attitudes and experiences regarding communicating about errors with the hospital and patients' families.

Design: Cross-sectional survey.

Setting: St Louis, Mo, and Seattle, Wash.

Participants: University-affiliated hospital and community pediatricians and pediatric residents.

Main Exposure: Anonymous 68-item survey (paper or Web-based) administered between July 2003 and March 2004.

Main Outcome Measures: Physician attitudes and experiences about error communication.

Results: Four hundred thirty-nine pediatric attending physicians and 118 residents participated (62% response rate). Most respondents had been involved in an error (39%, serious; 72%, minor; 61%, near miss; 7%, none). Respondents endorsed reporting errors to the hos-

pital (97%, serious; 90%, minor; 82%, near miss), but only 39% thought that current error reporting systems were adequate. Most pediatricians had used a formal error reporting mechanism, such as an incident report (65%), but many also used informal reporting mechanisms, such as telling a supervisor (47%) or senior physician (38%), and discussed errors with colleagues (72%). Respondents endorsed disclosing errors to patients' families (99%, serious; 90%, minor; 39%, near miss), and many had done so (36%, serious; 52%, minor). Residents were more likely than attending physicians to believe that disclosing a serious error would be difficult (96% vs 86%; $P = .004$) and to want disclosure training (69% vs 56%; $P = .03$).

Conclusions: Pediatricians are willing to report errors to hospitals and disclose errors to patients' families but believe current reporting systems are inadequate and struggle with error disclosure. Improving error reporting systems and encouraging physicians to report near misses, as well as providing training in error disclosure, could help prevent future errors and increase patient trust.

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O PEN COMMUNICATION about errors is the cornerstone of the patient safety movement. Health care workers are urged to communicate openly with institutions and colleagues following errors so that the event can be analyzed and recurrences prevented. Disclosure of harmful errors to patients is also recommended, both as an ethical obligation and to comply with emerging accreditation standards.¹ Yet such transparency appears to be far from the norm. Errors are underreported,²⁻⁶ and not all harmful medical errors are disclosed.⁷⁻¹² Understanding why information about errors is not communicated is essential if error reduction efforts are to succeed and if patients' confidence in the integrity of the health care system is to be restored.

For physicians, there are particular barriers to open and honest communication about errors. Although the patient-safety movement emphasizes that most errors are due to system breakdowns rather than individual failures,^{13,14} medical culture has long cherished professional autonomy and emphasized individual accountability for patient outcomes. Physicians' willingness to report errors to the hospital as well as discuss errors with colleagues and patients may be further diminished by fear of litigation, as well as concern of tarnishing their professional reputation among colleagues and patients.^{7,15-17}

The pediatric environment poses a unique challenge regarding open communication following errors because a third party, parents, must be included in the conversation. Although medical errors are frequent among hospitalized children,^{18,19} most

Table 1. Study Definitions

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†	An error that causes permanent injury or transient but potentially life-threatening harm.
Minor error†	An error that causes harm that 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.
Error reporting	Reporting an error to the hospital or health care organization.
Formal error reporting mechanism	Reporting an error to risk management or a patient safety program or completing an incident report (themselves or asking someone else to do so).
Informal reporting mechanism	Reporting an error by informing a supervisor, hospital executive, physician chief, or departmental chairman.
Error disclosure	Telling the patient's family about an error.

*Definitions were taken from *To Err is Human: Building a Safer Health System*.²⁴

†These definitions were provided on the face page of the survey and at the bottom of each page.

of the research to date on error reporting and disclosure has studied physicians practicing in adult patient populations.^{7,10,15,20,21} The absence of information about pediatricians' attitudes toward and experience with error reporting and disclosure inhibits the design and implementation of interventions to enhance open communication following pediatric errors. Therefore, we surveyed hospital-affiliated pediatricians and pediatric residents to characterize their experience with medical error, assess their attitudes toward sharing error information, and describe how they communicate about errors with the hospital, their colleagues, and patients' families.

METHODS

Between July 2003 and March 2004, pediatric medical attending physicians and residents completed the survey by mail or the Internet. The study population included clinically active residents and academic and community pediatricians who were affiliated with St Louis Children's Hospital (Washington University) in St Louis, Mo, or Seattle Children's Hospital and Regional Medical Center (University of Washington) in Seattle. In all settings, physicians could report errors or safety concerns directly to risk management or use incident reporting systems. All residents and some faculty could also use an electronic incident reporting system designed to improve patient safety. Of the initial study population, 898 (92%) of 975 pediatricians were eligible to participate (52 did not care for hospitalized patients, 3 were not clinically active, 7 could not be located, and 15 were ineligible for other reasons).

Although the survey was anonymous, respondents returned a postcard indicating study participation. Reminders were sent to nonrespondents by mail, e-mail, fax, and telephone.²² The institutional review boards at both participating universities approved the survey. Token incentives were used to encourage participation, including \$5 coffee cards (Seattle and St Louis) and a lottery for dinner (Seattle).

The questionnaire was developed by the authors and refined after several rounds of pilot testing and cognitive interviews to ensure clarity and item comprehension.²³ The final pediatric questionnaire (available on request) contained 68 items and took approximately 15 minutes to complete. Definitions for key terms (*serious error* and *minor error*, *near miss*, *adverse event* and *medical error*) were provided at the beginning of the questionnaire and at the bottom of each page. These and other study definitions are provided in **Table 1**.

The survey instrument included questions exploring pediatricians' attitudes and behaviors related to reporting errors to the hospital, discussing errors with colleagues, and disclosing errors to patients' families. Respondents were asked if an error reporting system to improve patient safety was available for physicians at their hospital, what mechanisms they had used to report errors, and to indicate features of a reporting system that would increase their willingness to report. Questions about error disclosure included the types of errors that should be disclosed, potential barriers to disclosure, and respondents' personal experience with ever disclosing a serious error or disclosing a minor error in the past 12 months.

Respondents reported whether they had been involved in a serious error, a minor error, or a near miss. They estimated the probability that a hospitalized child would experience a serious error, a minor error, or a near miss and that they personally would be sued for malpractice during the next year. General attitudes about errors and patient safety were explored by assessing respondents' level of agreement with the statements "medical errors are one of the most serious problems in health care," and "medical errors are usually caused by failure of care delivery systems, not the failure of individuals." Participants used 4-point Likert scales to respond to attitudinal questions (strongly agree to strongly disagree). Demographic questions measured respondents' age, sex, level of training, whether they were in private or academic practice, and the percentage of time in clinical practice and spent caring for hospitalized patients.

STATISTICAL ANALYSIS

Descriptive statistics included means and standard deviations for continuous variables and percentages for categorical variables. Questions involving a 4-point Likert scale were dichotomized at the midpoint (eg, agree vs disagree), and pediatricians' perception of their risk of a malpractice suit in the next year was dichotomized at the mean (<5% vs ≥5%). To compare characteristics of respondents and nonrespondents and responses from attending pediatricians and residents, we used the Wilcoxon rank sum test to compare continuous variables and the χ^2 or Fischer exact test to compare proportions. In a subgroup analysis, we used the χ^2 test to compare responses from those in private practice with other attending physicians. Two-tailed tests ($P < .05$) were used throughout to determine statistical significance.

Logistic regression was used to calculate odds ratios (95% confidence intervals) for factors associated with pediatricians' use of a formal error mechanism (reporting to risk management, a patient safety program, or using an incident report), controlling for level of training. For this analysis, prior involvement with an error was dichotomized based on the most severe error with which the pediatrician had been involved (at least a serious error vs only a minor error, a near miss, or no error). The χ^2 test was used to identify factors associated with agreement that serious errors should be disclosed to patients' families. Because our prior research and other studies in the

Table 2. Characteristics of Survey Respondents

	No. (%)			P Value*
	Total (N = 557)	Attending Pediatricians (n = 439)	Pediatric Residents (n = 118)	
Sex				<.001
Male	273 (50)	239 (56)	34 (30)	
Female	271 (50)	190 (44)	81 (70)	
Age, y, mean (SD)	42.6 (11.2)	46.2 (9.8)	29.5 (3.4)	<.001
Years in practice, mean (SD)	12.0 (10.4)	14.5 (10.2)	2.2 (1.5)	<.001
Proportion of time spent caring for hospitalized patients, %				<.001
0	6 (1)	0	6 (5)	
1-25	338 (62)	332 (78)	6 (5)	
26-50	50 (9)	48 (11)	2 (2)	
51-75	40 (7)	16 (4)	24 (21)	
76-100	109 (20)	32 (7)	77 (67)	

*Comparison of attending pediatricians and pediatric residents.

literature^{1,25-27} suggested that most pediatricians would endorse disclosure of serious errors, this variable was dichotomized as “strongly agree” vs “other.” All analyses were performed using SAS (version 9.0; SAS Institute Inc, Cary, NC).

RESULTS

STUDY POPULATION

The survey response rate was 62% (557/898) and did not differ by site (Seattle, 307 [58%] of 531; St Louis, 231 [63%] of 369; $P=.15$. Site was unknown for 19 participants and 2 ineligible respondents), with 80% completing a paper survey. Respondents and nonrespondents did not differ by sex or type of practice (attending physicians) or year of training (residents). Characteristics of respondents are provided in **Table 2**. Of the 439 attending pediatricians, 50% were in private practice and 73% worked at least half-time in clinical practice. For this report, unless otherwise stated, responses from attending pediatricians and residents did not differ.

ATTITUDES TOWARD ERRORS AND ERROR EXPERIENCE

Respondents believed that errors occurred frequently among hospitalized children, on average estimating that 16% of patients would experience a near miss; 16%, a minor error; and 4%, a serious error during their hospitalization. Seventy-six percent agreed that medical errors are one of the most serious problems in health care, and 56% agreed that “medical errors are usually caused by failures of systems, not failures of individuals” (private attending physicians, 45%; other attending physicians, 63%; $P<.001$).

Most respondents had been involved in an error: 39% reported prior involvement with a serious error (attending physicians, 45%; residents, 18%; $P<.001$); 72%, with a minor error; and 61%, with a near miss, while 7% reported no error involvement. On average, respondents perceived their own risk of being named in a malprac-

tice suit in the next year as 5% (SD 9.3%), with a median of 2% (interquartile range, 1%-5%).

ERROR REPORTING TO THE HOSPITAL OR HEALTH CARE ORGANIZATION

The majority of respondents believed that to improve patient safety, they should report serious errors (97%), minor errors (overall, 90%; attending physicians, 88%; residents, 96%; $P=.02$), and near misses (82%) to their hospital or health care organization. However, many respondents (40%) did not know if their hospital or health care organization had an error reporting system that physicians could use to improve safety, 51% believed that such a system was available at their institution, and 9% said that it was not available. Pediatricians in private practice were more likely than other pediatricians not to know if such a reporting system was available (50% vs 35%) or to believe that it was unavailable (17% vs 5%) ($P<.001$).

Overall, 92% of respondents had used at least 1 formal mechanism to report an error, most commonly using incident reports (65%) (**Table 3**). Pediatricians in private practice were less likely to formally report errors than other attending physicians (72% vs 92%; $P<.001$). Factors associated with use of a formal error reporting mechanism in the bivariate analyses are presented in **Table 4**. Pediatricians were more likely to report an error if they agreed that errors were one of the most serious problems in health care (odds ratio [OR], 1.78 [95% confidence interval (CI), 1.13-2.73]) or were caused by system rather than individual failures (OR, 2.74 [95% CI, 1.80-4.12]). Perceived risk for a personal malpractice lawsuit in the next year ($\geq 5\%$ vs $<5\%$) was not associated with formal reporting (OR, 1.38; [95% CI, 0.91-2.11]).

Many respondents also used informal mechanisms to report errors (74%), with 8% exclusively reporting errors informally. The most common informal reporting practice was to tell a supervisor or manager (overall, 47%; attending physicians, 45%; residents, 57%; $P=.02$) (Table 3).

Table 3. Error Reporting Mechanisms Used by Pediatricians*

	No. (%)			P Value†
	Total (N = 557)	Attending Pediatricians (n = 439)	Pediatric Residents (n = 118)	
Formal reporting				
Incident report	360 (65)	286 (65)	74 (63)	.60
Risk management	276 (50)	254 (58)	22 (19)	<.001
Patient safety program	64 (12)	53 (12)	11 (9)	.41
Informal reporting				
Supervisor or manager	263 (47)	196 (45)	67 (57)	.02
Physician chief or department chair	210 (38)	181 (41)	29 (25)	.001
Hospital/health care organization executive	58 (10)	55 (13)	3 (3)	.002

*Pediatricians were asked to select reporting mechanisms they had used to report errors to their hospital or health care organization to improve patient safety.
†Comparison of attending pediatricians and pediatric residents.

Table 4. Factors Associated With Formal Error Reporting Adjusted for Level of Training*

Factor	Who Agree or Have Factor Present, %	Bivariate Analysis†	
		OR (95% CI)	P Value
Attitudes about patient safety and reporting (agree vs disagree)			
Physicians should report serious errors	97	3.08 (1.04-9.15)	.04
Physicians should report minor errors	90	3.45 (1.91-6.24)	<.001
Physicians should report near misses	82	1.85 (1.12-3.05)	.02
Medical errors are usually caused by failure of care delivery systems, not failure of individuals	56	2.74 (1.80-4.12)	<.001
Medical errors are one of the most serious problems in health care	76	1.78 (1.13-2.73)	.01
At my institution, system changes to improve patient safety occur after errors are reported	86	0.87 (0.45-1.70)	.68
Malpractice risk			
≥5% Chance that will be named in a malpractice suit in the next year (vs <5%)	44	1.38 (0.91-2.11)	.13
Personal involvement in an error (categorized by most severe type of error involved with)			
Serious error (vs other error involvement or none)	39	3.99 (2.36-6.74)	<.001

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

*Formal error reporting was defined as selection by the pediatrician of at least 1 of the following mechanisms to "report errors to the hospital or health care organization to improve patient safety": reporting to risk management or a patient safety program (if one was available) or completing an incident report (self or asked another to do so).

†Adjusted for level of training.

Only 39% of respondents believed that current systems for pediatricians to report patient safety problems to the hospital were adequate (attending physicians, 34%; residents, 55%; $P < .001$). When respondents were asked to select features of a reporting system that would in-

crease their willingness to report errors to the hospital, the following factors were chosen: evidence that the information was used for system improvements (89%), assurance that the information was confidential and non-discoverable (88%), a nonpunitive reporting system (89%), and a process that takes less than 2 minutes to use (73%) and was local to their unit or department (58%).

ERROR DISCUSSION WITH COLLEAGUES

Ninety-one percent of respondents endorsed discussing errors with colleagues, and 72% identified colleagues as a source of information about errors. Respondents had discussed all types of errors with their colleagues, including serious errors (overall, 48%; attending physicians, 51%; residents, 38%; $P = .02$), minor errors (69%), and near misses (57%). When asked what types of errors they had discussed with colleagues and reported to the hospital, for each level of error severity, more physicians had discussed an error informally with colleagues than had reported errors to risk management or a patient safety program (**Figure**).

ERROR DISCLOSURE TO FAMILIES OF PEDIATRIC PATIENTS

Almost all respondents endorsed disclosure of serious errors (99%) and minor errors (90%) to families of pediatric patients, but fewer supported disclosure of near misses (overall, 39%; attending physicians, 43%; residents, 25%; $P < .001$). Respondents' perception of the likelihood of a personal malpractice suit in the next year had no effect on their endorsement of disclosure (of those who perceived their malpractice risk to be $\geq 5\%$ or $< 5\%$, 72% and 69% strongly endorsed disclosure, respectively; $P = .45$). Most respondents agreed that disclosing a serious error would be very difficult (overall, 88%; attending physicians, 86%; residents, 96%; $P = .005$) and would make it less likely that the family would sue (overall, 77%; attending physicians, 74%; residents, 88%; $P = .001$). Despite supporting disclosure of serious errors to family members, many respondents, especially residents, identified factors that might make them less likely to do so (**Table 5**).

Many respondents had disclosed an error to a patient's family. Fifty-two percent had disclosed a minor error in the past 12 months, and more attending pediatricians than residents had ever disclosed a serious error (overall, 36%; attending physicians, 42%; residents, 12%; $P < .001$). More residents than attending pediatricians had received education or training about how to disclose errors (57% vs 29%; $P < .001$). More than half of all respondents were very interested in receiving "just-in-time" training about error disclosure after a serious error occurred (attending physicians, 56%; residents, 69%; $P = .03$), and 35% were very interested in general disclosure training.

COMMENT

Understanding what might motivate or deter physicians from sharing error-related information as well as physicians' current practices are important first steps toward increasing error reporting and disclosure. This study, the first to our knowledge to examine communication about errors in a large sample of pediatricians, found that most pediatricians and pediatric residents had been involved in errors and endorsed open communication about errors with the hospital, their colleagues, and patients' families. Yet our study also identified barriers to transparent error communication that must be addressed to improve the safety of hospitalized children.

Pediatricians felt current reporting systems were inadequate. Perhaps misgivings about current systems partly explain these physicians' preference for informal reporting behaviors, such as discussing errors with colleagues.^{2,7,28} While this study confirmed previously identified barriers to error reporting, such as insufficient time to report and fear of punishment,^{4,29-31} pediatricians' fear of malpractice litigation did not appear to affect their self-reported formal reporting behaviors. This study also revealed that many pediatricians had problems accessing a reporting system to improve safety and were more willing to report errors if they saw evidence of system-level improvements. These findings suggest that redesigning reporting systems to include features preferred by physicians and disseminating information about system changes to improve patient safety would likely result in increased error reporting by pediatricians. Training will be required for all system users with targeted educational programs for private physicians who were less likely to report errors than their colleagues working in academic or other settings. The current failure of hospital reporting systems to capture information about errors from physicians impedes efforts to accurately characterize the epidemiology of pediatric medical errors and to improve the safety of hospitalized children.^{4,6,29}

Another important barrier to error reporting may be the culture of medicine itself—a deeply rooted culture that expects error-free practice, emphasizes individual accountability, and tends to blame the individual when he or she fails to perform perfectly.^{7,32,33} Our data suggest that pediatricians, like other physicians,¹² have not yet fully embraced the concept of system-based solutions to patient-safety problems. Pediatricians who feel personally responsible for errors in the care of their patients are

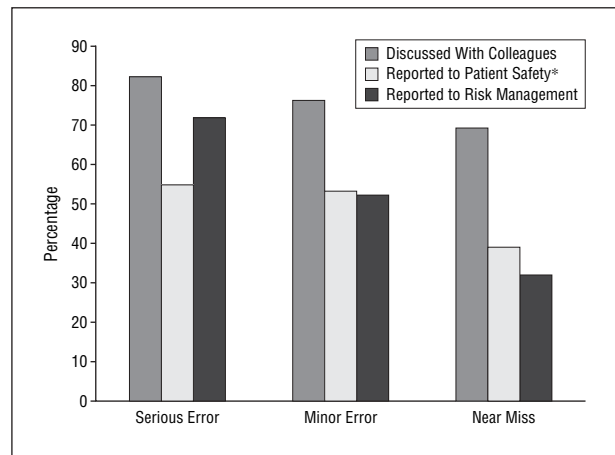


Figure. Error communication by pediatricians and pediatric residents by error type. These analyses were limited to those physicians who reported involvement in each error type. The samples included 219 physicians involved in a serious error; 399, in a minor error; and 341, in a near miss. *"Reported to Patient Safety" was limited to respondents who indicated that such a program was available at their hospital.

likely to institute local remedies to prevent future errors and may perceive error reporting to be unnecessary. Indeed, study respondents who believed that errors were usually due to system rather than individual failures were more likely to report errors. Pediatric department chairs, hospital executives, and other opinion leaders can promote culture change by encouraging their colleagues to regard errors as opportunities to design better systems of care for all pediatric patients.

In other hazardous industries, error prevention activities focus on learning from near misses, because they occur more often than adverse events, have similar latent causes, and are less threatening to report.³⁴⁻⁴⁰ Although most survey respondents endorsed reporting a near miss and were more likely to have been involved in a near miss than in a serious error, they actually reported near misses less often than they did more serious errors, a finding consistent with other studies.^{4,5} This discrepancy between pediatricians' willingness to report a near miss and their reporting behavior may be because their prior experience of error reporting has been limited to systems designed to manage financial risks rather than promote safer systems of care.^{4,37,38,41} Developing systems that encourage reporting of near misses and educating physicians in their use will reduce the future risk of pediatric patients being harmed by more serious adverse events.

Our results also highlight the challenges of disclosing errors to family members. While pediatricians endorsed the general concept of disclosing serious errors to families, they also reported that multiple barriers might inhibit disclosure. Some study physicians said they might be less likely to disclose a serious error if they thought the patient's family would not understand, was unaware of the error, or did not want to know. However, most patients want to know if an error happened, even if harm was minor.⁴² These physicians' attitudes toward disclosure were not influenced by their perceived likelihood of a malpractice lawsuit; in fact, 3 in 4 physicians thought that disclosure would reduce the likelihood of a law-

Table 5. Factors That Might Deter a Pediatrician From Disclosing a Serious Error to a Patient's Family*

	No. (%)			P Value†
	Total (N = 557)	Attending Pediatricians (n = 439)	Pediatric Residents (n = 118)	
"If I think the patient's family would not understand what I was telling them."	279 (50)	224 (51)	55 (47)	.40
"If I think the patient's family would not want to know about the error."	121 (22)	87 (20)	34 (29)	.04
"If I didn't know the patient's family well."	92 (17)	72 (16)	20 (17)	.90
"If I think I might get sued."	84 (15)	59 (13)	25 (21)	.04
"If the patient's family is unaware that the error happened."	83 (15)	52 (12)	31 (26)	<.001
"If I think the patient's family would become angry with me if I did so."	53 (10)	39 (9)	14 (12)	.30

*Pediatricians were asked to select factors that might make it less likely that they would disclose a serious error to a patient's family. Response options were to select the item or not.

†Comparison of attending pediatricians and pediatric residents.

suit. While no definitive data exist regarding the impact of disclosing pediatric errors on malpractice claims,⁴³ recent surveys suggest that full disclosure would reduce the likelihood of legal action,^{44,45} and several institutions, including at least 1 major pediatric center, have adopted formal policies of full disclosure without unfavorably impacting their malpractice experience.⁴⁶ The medical profession should develop disclosure guidelines to help physicians with this difficult task, and further research should explore the unique barriers to error disclosure in the pediatric setting and evaluate different disclosure strategies.

Open communication about errors presents special challenges for physician trainees. Many pediatric residents reported prior involvement in errors and had disclosed errors to patients' families. Yet these residents were more likely than attending pediatricians to express concern about the difficulty and potential negative consequences of disclosing errors.^{7,31} The topic of error disclosure affords an ideal opportunity to integrate several of the core competencies mandated in the recent Graduate Medical Education guidelines,⁴⁷ including communication skills and professionalism. Pediatric residency training should include formal instruction in error disclosure, as well as opportunities to practice disclosure and receive feedback.⁴⁸ Opportunities to practice disclosure could include observing and being observed by senior physicians or by disclosing hypothetical errors to standardized patients.^{42,49} Given the challenges in disclosing errors to patients, attending pediatricians should carefully plan these conversations in advance with the resident and also be present to lead or assist with the disclosure itself.

There are several limitations to our study. We collected data from physicians associated with pediatric hospitals in only 2 geographic areas. There could be both institution-specific and state-specific differences in physician attitudes about safety related to institutional culture or educational initiatives in patient safety or to the state malpractice and regulatory climate. These factors might limit the ability to generalize our findings to other settings. However, the issues associated with communi-

cation about errors are probably not regional, and our high response rate and large sample size contribute to the generalizability of study findings. The survey was all self-reported, and we do not know how often pediatricians actually reported or disclosed errors. Although the survey was anonymous, respondents' answers may have been influenced by social desirability, leading us to overestimate positive attitudes and perceived desired behaviors. Finally, although we asked respondents about errors in which they had been personally involved, their attitudes and practices of error reporting and disclosure may vary depending on their degree of involvement in the event.

CONCLUSIONS

Although communication about medical errors is difficult, it is also essential if pediatricians are to fulfill their professional obligation to work with health care systems to identify and reduce errors¹⁴ and to disclose errors to patients' families.¹ While pediatricians endorse reporting errors to the hospital and disclosing errors to patients' families, system changes are required to facilitate these communications. The hospital must facilitate the reporting of errors and near misses by pediatricians so that effective, safer systems of care can be developed and implemented. In addition, open and honest discussions following pediatric errors must occur to maintain and improve patient trust. Such open communications about errors are likely to benefit current and future pediatric patients, their families, pediatricians, and the hospital.

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I think you have to be very careful to only speak about a few things. If you have some credibility, it only goes a small distance.

—Bill Gates