Views of Emergency Medicine Trainees on Adverse Events and Negligence: Survey Results from an Emergency Medicine Training Program in a Regional Health Care System Following the National Standard of Care

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Abstract

Objective: Little is known about the awareness, understanding, and attitudes of emergency medicine (EM) trainees regarding the medicolegal aspects of adverse events statewide. Investigators evaluated EM trainees' perception of adverse events and medical negligence in Rhode Island. **Methods:** A cross-sectional questionnaire study was conducted during a randomly selected EM trainee conference. EM trainees rotated in a 966-bed health care system with annual adult and pediatric ED census of over 190,000 patients. **Results:** Of 28 EM trainees, 17 (61 percent sample; 35 percent target population) participated in the questionnaire assessment. Two-thirds of respondents indicated that health professionals not working together or not communicating as a team were very important causes of adverse events; 12 of 16 respondents properly defined negligence; 5 respondents were able to provide an appropriate example of an adverse event due to negligence. **Conclusion:** EM trainees are cognizant of adverse events and their causes and perceive medical negligence as a significant problem.

Introduction

Emergency medicine (EM) trainees in the United States strive to treat emergent and nonemergent events in the hospital emergency department (ED) in accordance with established medicolegal care standards.[1, 2] Clinical reports[3, 4] meticulously document trainees as legally being held to the same standard of care as their attending physicians. Quality of care standards are especially salient when a trainee is faced with a patient adverse event. Yet, in adverse event situations in which care standards do not exist, rules with which to proceed are absent, and a trainee may be at risk for providing negligent care.[5] Such situation-specific adverse events, especially in a volatile ED environment where rates of utilization continue to rise, [6] make conditions for EM trainees ever more challenging. Concerns over EM trainee expectations and ED conditions have pressured State and Federal policymakers to formulate streamlined care standards.[7, 8]

To date, standards of care for physicians and for trainees are inconsistent across the United States. A 2007 commentary by Lewis and colleagues[9] noted that 29 States and the District of Columbia are governed by the U.S. national standards, while 21 States are governed by a

standard of care based on locality rules. For the former, the United States as the national ruling jurisdiction suggests that general (e.g., internal medicine) and specialty (e.g., emergency medicine) physicians and trainees follow rules typically drafted by professional medical societies. For the latter, with a locality ruling jurisdiction, general and specialty physicians and trainees are held to a State locality rule, in which a statute or case law holds physicians and trainees to the standard of care practiced by those physicians in the "same or similar community" of that State.[9] State-to-State variation in patient care standards adds to difficulties facing the medical community when addressing an adverse event due to negligence. In light of practice conditions unique to the specialty, this standard may severely compromise patient safety in EM.[10, 11]

Little is known about an EM trainee's awareness of and attitudes about adverse events, negligence, and their relationship to patient safety in the context of a statewide jurisdiction practicing the U.S. national standard of care. As the patient safety topics of adverse events and negligence become drafted into board certification exams,[12] surveying of EM trainees—those candidates anticipated to take such tests in the future—might provide general insights and suggest strategies to assess which areas need further attention by EM residency programs and for the betterment of patient safety.

In this study, we assessed views of EM trainees on adverse events with respect to negligence in the State of Rhode Island, where all practicing EM physicians and trainees are expected to follow the U.S. national standard of care, including clinical practice guidelines, position statements, and education resource guides as developed by the Society for Academic Emergency Medicine,[13] the American Academy of Emergency Medicine,[14] the American College of Emergency Physicians,[15] and collaborative partner organizations.

Methods

Study Setting and Population

Forty-eight trainees (12 interns and 36 residents) in the EM residency program affiliated with the Alpert Medical School of Brown University were chosen as the study population. Study participants rotated in three separate EDs of a 966-bed health care system with annual adult and pediatric ED census of over 190,000 patients. Two of these EDs are Level 1 Trauma Centers.

The implementation strategy aimed to capture a representative sample of the study population from an EM residency teaching conference. One conference was randomly selected from those scheduled during 2006. Twenty-eight trainees (58 percent of the target population) were present at the selected meeting. Seventeen of 28 responded to the questionnaire (61 percent sample response rate; 35 percent target population response rate).

Approximately two-thirds of the study sample was male (11/17). A total of 6 interns and 11 residents completed the questionnaire; this represented half (6/12) of the interns and one-third (11/36) of the residents within the target population. Three residents were in their second training year, four residents in their third training year, and four residents in their fourth training year or more of EM. More than half of the respondents (9/17) were within the age range of 25 to 29

years. About one-third of the respondents (6/17) were between the ages of 30 and 34; one respondent was between the ages of 35 and 39. No trainee respondent in this study sample had been sued for malpractice.

Questionnaire Design

This study employed measurement tools from previous studies[16, 17, 18, 19, 20] and those developed by the primary investigator (HS). The Institute of Medicine (IOM) definitions of medical error and adverse event were adapted for study use. A medical error was defined as "the failure to complete a planned action as intended or the use of a wrong plan to achieve an aim." An adverse event was defined as "an injury caused by medical management error rather than the patient's underlying disease or condition."[16] The latter definition was modified to strictly address medical practice in the United States and to control for training electives abroad.

Examples of adverse events came from a previous study[17] addressing views of residents on medical error and adverse events causes: "pneumothorax, retained objects, hospital-acquired infections, decubitus ulcers, perioperative myocardial infarctions (MIs), line infections, and falls." Finally, the American Board of Medical Specialties – Council of Medical Specialty Societies (ABMS-CMSS) semantic and literature review helped develop a uniform definition of negligence as: "Medical care that fell short of the expected standards; expected standards refer to widespread use by U.S. EM physicians, and/or national or local organization-based written guidelines in the contextual situation."[12, 18]

Twelve main questions, divided into four sections, were included in the questionnaire. Sections were developed and ordered based on a review of patient safety literature. Quantitative questions included: "General Issues of Adverse Events," "Causes of Adverse Events," "Strategies to Reduce Adverse Events," and "Malpractice Issues." The "General Issues of Adverse Events" section, with six questions [Q1– Q6] derived from a previous national study,[19] was designed to introduce the terminology of adverse events and engage the respondent to think of adverse events. The standardized questionnaire was pretested on an internal medicine residency program at the same institution and modified for content validity. Full description and study results are in an unpublished report.[21]

The "Causes of Adverse Events" section, with one question [Q7], aimed to transition to the topic of adverse events by querying subjects on objectively identified causes of hospital-based adverse events. The "Strategies to Reduce Adverse Events" section, with one question [Q8], asked respondents to consider several national strategies proposed by physician experts to reduce adverse events. The "Malpractice Issues" section, with two open-ended questions [Q9-Q10] and two closed-ended questions [Q11-Q12], was designed to evaluate views on the medico-legal aspects of EM practice and personal experience, respectively. One question [Q11] of malpractice fear came from a previous report[20] using skilled opinion and factor analysis. (This main section was addressed last, as malpractice can be a sensitive topic and might be perceived as intrusive.[22]) Finally, six questions [Q13 – Q18], asked for trainee demographic information.[23] The EM Trainee Patient Safety Questionnaire can be found in the Appendix.

Implementation Strategy

This study utilized a cross-sectional design and was conducted during an EM trainee conference. The purpose of the study and the importance of confidentiality were explained to the trainees. A typewritten questionnaire instrument and blank envelope were distributed to each trainee present at the conference. Trainees were asked to read the written consent form and instructions section, serving as the first page of the questionnaire instrument, and to complete it privately on a voluntary basis.[24] No honorarium was offered. Trainees placed their completed questionnaires in anonymous envelopes that were then collected in a separate container. The Institutional Review Board at the participating health care system approved the study.

Questionnaire Analysis

All categorical data from the questionnaire instruments were entered into Epi Info™ version 3.3.2, and free-text answers were transcribed verbatim. Data entry was rechecked for quality purposes. Categorical results were analyzed by cross-tabulation.

Open-ended responses were qualitatively assessed for thematic content; [25] answers that fell into a specific theme were tabulated. Those answers that did not fall into a theme were tabulated into a section entitled "other." Response meanings of adverse events were analyzed by reviewing statements that addressed the theme of "care that fell short of the expected standard" or any variations of those words (e.g., providing substandard care); these were tabulated into two columns, either noted directly or indirectly. Statements addressing negligence as doing harm to a patient were added into a separate column. Response examples of adverse events due to negligence were qualitatively analyzed by separating each content description into three areas: context, standard of care, and injury. Each standard-of-care response was then considered in context and compared with written guideline policies[15] (when available) in widespread use by EM physicians as the U.S. national standard of care. An EM physician analyzed the results for depth and validity. Full responses from the open-ended questions are detailed in the Results section. For the purpose of improved clarity, acronym and grammatical errors have been corrected without changing the phrase content or meaning.

Results

Closed-Ended Categorical Analysis

General issues of adverse events. All respondents (17/17) labeled adverse events as a problem that is at least "important." More than half the respondents (10/17) marked adverse events as occurring at least "often." Less than half the respondents (8/17) considered the patient partially responsible for adverse events made during their care. Three-fourths of the respondents (12/16) agreed on keeping hospital reports of adverse events confidential instead of releasing them to the public; one of the respondents did not appropriately check the item, so this was omitted from the analysis. All respondents except one (16/17) agreed that physicians should be required to inform patients about an adverse event that resulted in serious harm. All but two respondents (15/17) marked the most important cause of adverse events as mistakes made by physicians; the

remaining two marked two important causes (the question explicitly stated to choose only one answer): accordingly, their responses were omitted from the analysis.

Causes of adverse events. Among the four listed causes of adverse events, almost two-thirds of the respondents (11/17) marked health professionals not working together or not communicating as a team to be "very important" causes. Next, overwork, stress, or fatigue was marked as a "very important" cause of adverse events by less than half the respondents (7/17). Not having enough nurses and poor supervision of health care professionals were labeled as "somewhat important" causes of adverse events by two-thirds of the respondents (12/17 and 11/17, respectively).

Strategies for reducing adverse events. From four listed strategies for reducing adverse events, more than three-quarters of the respondents (13/17) marked the use of an online adverse event reporting system as at least "somewhat effective." Providing a mechanism of coping support was marked by more than two-thirds of respondents (12/17) as at least "somewhat effective." Having adverse events addressed in board certification exams was marked by more than half the respondents (10/17) as at least "somewhat effective." However, one listed item was overwhelmingly perceived as a noneffective solution: three-quarters of the respondents (13/17) considered the development of a system to quickly and fairly compensate an injured patient as at least "not effective."

Malpractice issues. Of the six listed items of malpractice concern, more than half the respondents (9/17) "strongly agreed" on the statement regarding the use of clinical judgment rather than technology to make decisions as a risky endeavor. The feeling of pressure from a day-to-day threat of malpractice litigation, as well as the ordering of tests/consultations to avoid the appearance of malpractice, were noted with "strong agreement" by more than half the respondents (9/17 and 9/17, respectively). Less than half the respondents (7/17) "strongly agreed" on asking for consultant opinions to reduce the risk of being sued. The concern of being involved in a malpractice case sometime in the next 10 years was "strongly agreed" upon by less than half the respondents (6/17) compared with the previous four items. Finally, the issue of having to make significant changes in practice patterns because of recent legal developments was decisively not "strongly agreed" upon by respondents (3/17). Results of all closed-ended responses are documented in Table 1.

Open-Ended Qualitative Analysis

Meaning of negligence. Responses to an open-ended query to assess how trainees defined negligence were qualitatively assessed for thematic content, based on the U.S. national standard of care definition. Three-quarters of the responses (12/16) directly or indirectly addressed the theme of substandard care. Select responses included: (a) "Failure to provide care equal to the standard of care in terms of thoroughness, timeliness"; (b) "Intentional lack of the appropriate attention to patient care or management, resulting in patient harm; not abiding by practice patterns considered to be the standard of care"; and (c) "Not providing the standard of care." Some responses that addressed negligence other than substandard care included: (a) "Doing harm without consideration of alternative medical therapies or inattention to procedure/clinical management"; (b) "Willful action that causes damage"; and (c) "Not being aware of a medical problem or failing to search for it." Table 2 contains all 16 responses.

Examples of adverse events due to negligence. Based on sample responses, three themes were developed: (1) a theme addressing both components of adverse events and negligence (5 examples); (2) a theme addressing negligence, but no adverse event injury (11 examples); and (3) a theme for responses with inadequate information or context for reliable assessment (12 examples). All 28 responses are provided in Table 3.

Statements addressing an adverse event due to negligence made up less than one-fifth of the responses (5/28). Some examples noted: (a) "Placing central line quickly without consideration for ultrasound guided peripheral line, and sustaining a complication"; (b) "Giving patient pneumothorax post-central venous access placement and not checking chest x-ray"; and (c) "Patient who dies after ruptured ectopic 2 days after coming to hospital with abdomen pain and sent/brought home without a urine pregnancy test."

Statements addressing a negligence-based event made up less than half the responses (11/28). Some examples were: (a) "1-month old presents with fever, lethargy, no workup despite two presentations"; (b) "Intubating the esophagus and not recognizing it"; and (c) "Not giving antibiotics within 4 hours of a pneumonia presenting to the emergency room."

Finally, statements addressing no clear theme made up 40 percent of the responses (12/28). Some examples included: (a) "Not calling cardiology for an ST-elevation myocardial infarction"; (b) "Failure to obtain a post-central line chest x-ray"; and (c) "Not ordering an appropriate test."

Discussion

Overview

This statewide assessment found that EM trainees understood the importance of studying adverse events. The study also found that EM trainees were concerned with medical negligence. Previous ED work[26] has addressed EM trainee views on patient safety issues, but it did not clarify whether trainees practiced in a jurisdiction that followed the U.S. national standards of care or the locality rule. The jurisdiction in our study was defined to help create a more precise context for assessing patient safety issues associated with adverse events and negligence.

In our study, EM trainee respondents viewed adverse events as an important issue of clinical practice. This compares with another study[17] assessing trainee views on adverse events in a different State. As frontline physicians, trainees are a target population that encounters many situation-specific events. Accordingly, the emotional and affective drive to improve patient care may be high within this population.

We found an overwhelming majority of the respondents (75 percent of 16 EM trainees) preferred that adverse event reporting be kept confidential and used only as a deterrent to future errors. This finding parallels the 2002 project, "U.S. Medical Error: Practicing Physicians and Public Views Study."[19] In that study, a representative sample of 831 U.S. physicians was assessed via mail and online survey; the majority (86 percent) of respondents chose the same option. Confidentiality of adverse event reports and their use as a feedback mechanism might be

Table 1. EM trainee closed-ended responses [Q1-8; Q11-17] & open-ended responses [Q18] (%)

Question					
	Not at all important	**Not important**	**Somewhat important**	**Very important**	**Total N**
1. *How important a problem do you think adverse events are in the United States today?* [N (%)]	0	0	7 (41)	10 (59)	17
	Not often at all	**Not often**	**Somewhat often**	**Very often**	**Total N**
2. When people seek help from a health care professional, how often do you think adverse events are made in their care? [N (%)]	0	7 (41)	9 (53)	1 (6)	17
	Not often at all	**Not often**	**Often**	**Very often**	**Total N**
3. How often do you think patients are at least partially responsible for adverse events made in their care? [N (%)]	2 (12)	7 (41)	7 (41)	1 (6)	17
	Confidential (used only to learn how to prevent future mistakes)		**Also released to the public**		**Total N**
4. Should hospital reports of adverse events be confidential and only used to learn how to prevent future mistakes, OR should they also be released to the public? [N (%)]	12 (75)		4 (25)		16
	Yes		**No**		
5. Should physicians be required to tell patients if an adverse event resulting in serious harm is made in their care, OR not? [N (%)]	16 (94)		1 (6)		17
	Mistakes made by nurses	**Mistake made by physicians**	**Mistakes made by other health care professionals**		**Total N**
6. Which of the following do you think is the MOST important cause of adverse events? (Check one only.) [N (%)]	0	15 (88)	0 (0)		15
	Not at all important	**Not important**	**Somewhat important**	**Very important**	**Total N**
7a. Overwork, stress, or fatigue of health professionals [N (%)]	0 (0)	0 (0)	10 (59)	7 (41)	17
7b. Health professionals not working together or not communicating as a team [N (%)]	0 (0)	0 (0)	6 (35)	11 (65)	17
7c. Not enough nurses in hospitals [N (%)]	0 (0)	2 (12)	12 (71)	3 (18)	17

Table 1. EM trainee closed-ended responses [Q1-8; Q11-17] & open-ended responses [Q18] (%) (continued)

Question	Not at all important	Not important	Somewhat important	Very important	Total N
7d. Poor supervision of health care professionals [N (%)]	0 (0)	4 (24)	11 (65)	2 (12)	17
8a. Providing coping support, for the health care professional, when involved with an adverse event [N (%)]	1 (6)	4 (24)	10 (59)	2 (12)	17
8b. Developing a system that quickly and fairly compensates a patient injured by an adverse event [N (%)]	6 (35)	7 (41)	3 (18)	1 (6)	17
8c. Having adverse events be addressed in board certification examinations [N (%)]	3 (18)	4 (24)	8 (47)	2 (12)	17
8d. Using an online Adverse Event Report [N (%)]	2 (12)	2 (12)	9 (53)	4 (24)	17
Questions 9, 10a, & 10b			**On separate tables**		
Question	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly agree**	**Total N**
11a. I have had to make significant changes in my practice patterns because of recent legal developments concerning medical care delivery [N (%)]	3 (18)	3 (18)	8 (48)	3 (18)	17
11b. I am concerned that I will be involved in a malpractice case sometime in the next 10 years [N (%)]	0 (0)	0 (0)	11 (65)	6 (35)	17
11c. I feel pressured in my day-to-day practice by the threat of malpractice litigation [N (%)]	1 (6)	2 (12)	5 (29)	9 (53)	17
11d. I order some tests or consultations simply to avoid the appearance of malpractice [N (%)]	0 (0)	14 (24)	4 (24)	9 (53)	17

Table 1. EM trainee closed-ended responses [Q1-8; Q11-17] & open-ended responses [Q18] (%) (continued)

Question	Strongly Disagree	Disagree	Agree	Strongly agree	Total N
11e. Sometimes I ask for consultant opinions primarily to reduce my risk of being sued [N (%)]	0 (0)	5 (29)	5 (29)	7 (41)	17
11f. Relying on clinical judgments rather than on technology to make a decision is becoming riskier from a medico-legal perspective [N (%)]	0 (0)	1 (6)	7 (41)	9 (53)	17

12. Have you ever been sued for malpractice? [N (%)]	Yes	No	Total N
	0	100 % (17)	17

13. Are you male or female? [N (%)]	Male	Female	Total N
	11 (65)	6 (35)	17

14. Which of the following describes your current training level? [N (%)]	Medical student	Intern	Resident	Attending	Other	Total N
	0 (0)	6 (35)	11 (65)	0 (0)	0 (0)	17

15. Which of the following describes your current training year? [N (%)]	1	2	3	4	Total N
	6 (35)	3 (18)	4 (24)	4 (24)	17

16. What is your current training hospital? [N (%)]	Rhode Island	Memorial[a]	Other	Total N
	17 (100)	0 (0)	0 (0)	17

17. How old are you? (years) [N (%)]	≤24	25 - 29	30 - 34	35 - 39	≥40	Total N
	0 (0)	9 (56)	6 (38)	1 (6)	0 (0)	16

Table 1. EM trainee closed-ended responses [Q1-8; Q11-17] & open-ended responses [Q18] (%) (continued)

	Open-ended responses		Total N
18. If you were the researcher, what question would you like to ask providers about adverse events?	1.	1) What do you think should be done to reduce adverse events? 2) Have you ever informed a patient of a mistake, accident, or poor outcome for which you felt responsible? Why or why not?	8
	2.	Have a blank area for writing in suggestions in addition to just asking what we think about a preselected list of possible solutions.	
	3.	How many mistakes with serious consequences have you made in the last 6 months and the last 2 years?	
	4.	How many times have you *not* told a patient about an adverse event that affected them?	
	5.	How to decrease them?	
	6.	I would ask about other areas in which errors could be reduced than the ones in this survey.	
	7.	N/A	
	8.	What means of reducing adverse events have you undertaken in your practice?	

a Of note, the survey was erroneously printed with Memorial Hospital. Miriam Hospital was the intended category.

N = 17 respondents of 28 EM trainees: 61% sample response rate.

N = 28 respondents of 48 EM trainees in target population: 58% of target population present, and 35% target population response rate.

Table 2. EM trainee open-ended responses [Q9] to the meaning of negligence

Theme of substandard care (direct)	Theme of substandard care (indirect)	Theme of doing harm to a patient	Theme of other
"Establishment of physician-patient relationship, *failure to provide standard of care* resulting in poor outcome as a result of that failure."	"Failure to give medical care that is appropriate based on the patient's presentation, history, and physical exam that is available at that time."	"Doing harm without consideration of alternative medical therapies, or inattention to procedure/clinical management."	
"Failure to provide care equal to the standard of care in terms of thoroughness, timeliness."	"Lack of attention/action resulting in an adverse outcome."	"Doing something that harms a patient."	
"*Failure to provide the "standard of care"* for a given medical problem to a patient in a safe and timely manner."	"Making an obvious mistake, realizing there is a mistake, but taking no action or ignoring the mistake."		
"Intentional lack of the appropriate attention to patient care or management, resulting in patient harm: *not abiding by practice patterns considered standard of care."*	"Not offering proper use of treatment when necessary due to absence, or failed application."		"Not being aware of a medical problem or failing to search for it."
"Not holding the standard of care knowingly."	"Overlooking important info (e.g., lab values, phys exam findings) or failing to seek that important info and proceeding with action that results in harm to patient."	"Willful action that causes damage."	
"Not providing standard of care."	"Negligence is an action that results in an unwanted clinical result that occurs because of an error in judgment/ deviation from accepted protocols."		
Total N = 6	Total N = 6	Total N = 3	Total N = 1

Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
"Giving patient hematoma if placing central venous access by not checking coagulants." **Context:** Placing central venous access in patient **Standard of care:** Checking coagulants **Injury:** Hematoma	*"1 month old presents with fever, lethargy, no workup despite two presentations"* **Context:** 1-month old infant patient presenting with fever, lethargy, and performing no workup **Standard of care:** Performing a workup	*"Continue to do a procedure knowing something is wrong"*
"Placing central line quickly without consideration for ultrasound-guided peripheral line, and sustaining a complication." **Context:** Placing a central line quickly in patient **Standard of care:** Ultrasound guided peripheral line **Injury:** Complication	*"Intubating the esophagus & not recognizing it"* **Context:** Esophageal intubation of patient **Standard of care:** Recognizing esophageal intubation	*"Failure to obtain a post-central line chest x-ray"*
"Worsening subdural hematoma due to lack of Fresh frozen plasma and increased INR." **Context:** Increased International Normalized Ratio of patient **Standard of care:** Administering fresh frozen plasma **Injury:** Worsening subdural hematoma	*"Not checking enzymes in a patient with multiple risk factors & complaining of chest pain."* **Context:** Patient with multiple risk factors and complaints of chest pain **Standard of care:** Checking cardiac enzymes	*"Not calling cardiology for an ST-elevation MI"*
"Giving patient pneumothorax post central venous access placement and not checking chest x ray." **Context:** Post Central venous access placement in patient **Standard of care:** Checking a chest x ray **Injury:** Undetected pneumothorax	*"Not giving antibiotics within 4 hours of a pneumonia presenting to the ER"* **Context:** Staff knowledge of patient diagnosis of pneumonia within 4 hours of ED presentation **Standard of care:** Timely antibiotic administration	*"Not ordering an appropriate test"*

Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence (continued)

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
"Patient who dies after ruptured ectopic 2 days after coming to hospital with abdomen pain & sent/brought to home without a urine pregnancy test." **Context:** Female patient with abdominal pain **Standard of care:** Performing a urine pregnancy test **Injury:** Death from ruptured ectopic	*"Patient with wrist pain after a fall, no x-ray, wrist fracture ultimately decreased function."* **Context:** Patient has wrist pain after a fall **Standard of care:** Ordering an x-ray	*"Patient is not re-evaluated over extended period while changes go unnoticed"*
	"Failing to check mark INRs of person who is bleeding and takes coumadin." **Context:** Patient is bleeding and taking coumadin **Standard of care:** Checking of INR	*"The adverse events I've witnessed did not seem to be due to negligence"*
	"Giving a known allergen to a patient" **Context:** Knowledge of patient allergies **Standard of care:** Not administering an allergen	*"Failing to give antibiotics that are needed"* **Context:** Not known whether provider has knowledge or not of need to give antibiotics
	"Ignoring a lab result that may potentially be life-threatening, because patient has already been discharged & it's late to forget about it." **Context:** Obtaining a patient's lab data revealing potential life-threatening results **Standard of care:** Conducting follow-up	*"Not appropriately treating a medical condition by the standard of care"*
	"Not giving steroids for severe asthma." **Context:** Patient has severe asthma **Standard of care:** Provision of steroids	*"Not entertaining a possible treatment option"*

Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence (continued)

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
	"Not using a local anesthetic for a laceration repair." **Context:** Provider conducting a laceration repair on a patient **Standard of care:** Provision of local anesthetics	*"Not sending coagulants on a head bleed on coumadin"*
	"Failure to check medications delivered to patient." **Context:** Delivery of medicine to a patient **Standard of care:** Checking medication is appropriate	*"Giving a patient a med they are allergic to"*
		"Worst headache of life, diagnosis migraine, refusal for further followup" **Context:** Patient with major headache, and diagnosis is migraine; not clear if patient or provider refuses further follow-up
Total N = 5	**Total N = 11**	**Total N = 12**

a Adverse event due to negligence is defined as an injury caused by medical management, rather than the patient's underlying disease, due to provider-based substandard care

b Negligence is defined as substandard care. Negligence may or may not produce patient injury; the former product is called an adverse event due to negligence, and the latter product is a near miss event

c Not known whether provider has or was given knowledge or not of patient's

Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence (continued)

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
"Giving patient hematoma if placing central venous access by not checking coagulants." **Context:** Placing central venous access in patient **Standard of care:** Checking coagulants **Injury:** Hematoma	*"1 month old presents with fever, lethargy, no workup despite two presentations"* **Context:** 1-month old infant patient presenting with fever, lethargy, and performing no workup **Standard of care:** Performing a workup	*"Continue to do a procedure knowing something is wrong"*
"Placing central line quickly without consideration for ultrasound-guided peripheral line, and sustaining a complication." **Context:** Placing a central line quickly in patient **Standard of care:** Ultrasound guided peripheral line **Injury:** Complication	*"Intubating the esophagus & not recognizing it"* **Context:** Esophageal intubation of patient **Standard of care:** Recognizing esophageal intubation	*"Failure to obtain a post-central line chest x-ray"*
"Worsening subdural hematoma due to lack of Fresh frozen plasma and increased INR." **Context:** Increased International Normalized Ratio of patient **Standard of care:** Administering fresh frozen plasma **Injury:** Worsening subdural hematoma	*"Not checking enzymes in a patient with multiple risk factors & complaining of chest pain."* **Context:** Patient with multiple risk factors and complaints of chest pain **Standard of care:** Checking cardiac enzymes	*"Not calling cardiology for an ST-elevation MI"*
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Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence (continued)

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
"Patient who dies after ruptured ectopic 2 days after coming to hospital with abdomen pain & sent/brought to home without a urine pregnancy test." **Context:** Female patient presents with abdominal pain **Standard of care:** Performing a urine pregnancy test **Injury:** Death from ruptured ectopic	*"Patient with wrist pain after a fall, no x-ray, wrist fracture ultimately decreased function."* **Context:** Patient has wrist pain after a fall **Standard of care:** Ordering an x-ray	*"Patient is not re-evaluated over extended period while changes go unnoticed"*
	"Failing to check mark INRs of person who is bleeding and takes coumadin." **Context:** Patient is bleeding and taking coumadin **Standard of care:** Checking of INR	*"The adverse events I've witnessed did not seem to be due to negligence"*
	"Giving a known allergen to a patient" **Context:** Knowledge of patient allergies **Standard of care:** Not administering an allergen	*"Failing to give antibiotics that are needed"* **Context:** Not known whether provider has knowledge or not of need to give antibiotics
	"Ignoring a lab result that may potentially be life-threatening, because patient has already been discharged & it's late to forget about it." **Context:** Obtaining a patient's lab data revealing potential life-threatening results **Standard of care:** Conducting follow-up	*"Not appropriately treating a medical condition by the standard of care"*
	"Not giving steroids for severe asthma." **Context:** Patient has severe asthma **Standard of care:** Provision of steroids	*"Not entertaining a possible treatment option"*

Table 3. EM trainee open-ended responses [Q10a&b] to examples of adverse events due to negligence (continued)

Theme of adverse events due to negligence[a]	Theme of negligence only[b] (not sustaining an adverse event injury)	Examples with inadequate context/information[c]
	"Not using a local anesthetic for a laceration repair." **Context:** Provider conducting a laceration repair on a patient **Standard of care:** Provision of local anesthetics	*"Not sending coagulants on a head bleed on coumadin"*
	"Failure to check medications delivered to patient." **Context:** Delivery of medicine to a patient **Standard of care:** Checking medication is appropriate	*"Giving a patient a med they are allergic to"*
		"Worst headache of life, diagnosis migraine, refusal for further followup" **Context:** Patient with major headache, and diagnosis is migraine; not clear if patient or provider refuses further follow-up
Total N = 5	**Total N = 11**	**Total N = 12**

a Adverse event due to negligence is defined as an injury caused by medical management, rather than the patient's underlying disease, due to provider-based substandard care

b Negligence is defined as substandard care. Negligence may or may not produce patient injury; the former product is called an adverse event due to negligence, and the latter product is a near miss event

c Not known whether provider has or was given knowledge or not of patient's condition

"Standard of care" is based on: (1) widespread use by U.S. emergency physicians as the national care standard, and/or(2) professional medical society written guidelines (when available). Of note, (1) and (2) are NOT necessarily mutually exclusive.

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appropriate to improve EM trainee curricula on preventability vs. nonpreventability of adverse events. Incorporating confidential reporting systems may be suitable for EM residency trainee programs seeking to develop or enhance preexisting adverse event learning programs via improving dialogue about adverse events among trainees and other health care providers. [27]

Emergency medicine trainee respondents also marked health professionals' overwork, stress, fatigue, and the inability to communicate as a team as important factors contributing to preventable adverse events that lead to serious patient harm. The "U.S. Medical Error Study"[19] assessed this aspect and found that 50 percent of practicing physicians nationwide viewed these factors as barriers to improving patient safety. Our study specifically studied the term "adverse event." Accordingly, it may be that frontline EM trainees find stress and communication failures perpetuate preventable adverse events. Mechanisms that improve communication through teamwork approaches for the reduction of bedside errors and that reduce EM trainee stress need to be further investigated.

As an effective strategy to deter adverse events that result in serious harm, EM trainee respondents emphasized coping support for health professionals. Other medical specialties have used focus groups and surveys to assess trainee views on coping methods. A focus-group study[28] of the impact of stress on British surgery trainees found strategies to overcome stress-based adverse outcomes. These strategies included "stop and stand back," distancing technique, and self-talk. A survey study[29] of emotionally burnt-out U.S. internal medicine trainees found that, when they used discussion strategies to talk about trainee errors with clinical colleagues, family, and friends, it was beneficial. Coping strategies for EM trainees merit attention as demands of cognition and decisionmaking are substantial within the ED—i.e., a high degree of uncertainty, undifferentiated problems of varying acuity, and a need for expeditious intervention.[30, 31]

EM trainee respondents overwhelmingly reported that the development of a system that quickly and fairly compensates a patient injured by an adverse event as noneffective. Methods to make restitution for patients who have experienced medical injury warrant further discussion. The lack of studies addressing litigation and EM practice is serious, as the number of claims filed against EM trainees, especially for diagnostic errors, is moderate to high.[32] Future studies should investigate other avenues to address this issue in the ED arena.

Most EM trainee residents noted the following concerns as weighing against their work: the threat of malpractice litigation, the ordering of more tests to avoid the appearance of little testing (an assurance offensive tactic),[33] and the risk of clinical judgment. The risk of clinical judgment was a high concern in another study[20] that surveyed EM physicians, rather than EM trainees, in university-affiliated hospitals. In that study, EM physicians were grouped based on their risk-taking behaviors of lower, middle, and upper. Interestingly, all groups strongly agreed that relying on clinical judgment rather than on technology to make a diagnosis is becoming riskier. This similarity may stem from the nature of EM work in a volatile malpractice environment. That study, though, did not specify the target population's patient care standards; a comparison with incomplete context may lead to a conjecture. Specifying region- and State-based ruling jurisdictions may help future work improve the assessment of EM trainees and physicians concerns.

Rather than asking negligence-related questions based on vignettes, as has been done in previous empirical work, [33, 34] in this study we asked open-ended questions to define negligence and provide examples of an adverse event due to negligence. Almost all of the EM trainee respondents were able to define negligence from a U.S. national standard of care viewpoint. However, respondents had difficulty providing examples of adverse events due to negligence. Most respondents provided examples of negligence but not negligence-based adverse events.

In those examples that correctly provided an adverse event due to negligence, the substandard component was incorrect diagnostic testing or inadequate assessment.

This result signaled that some EM trainees practicing under the U.S. national standard of care might be cognizant of missed diagnoses and inadequate assessments while making decisions. Missed and delayed diagnoses tend to be situation-specific events. Accordingly, when EM trainees are confronted with this in the absence of rules, they might be uncertain as to how to proceed. It is important, therefore, that the EM trainee remains under the supervision of an attending physician whenever such situations arise.[3] Educational interventions and instructional exercises could further aid EM trainees in appropriate responses to adverse events due to negligence in situation-specific events.

Overall, the results from our study underscore practical ways to assess EM trainees' awareness of and attitudes about adverse events with respect to negligence in a State practicing the national standard of care. Published literature[35, 36, 37] finds many pervasive barriers to adverse event research, especially due to the complexity of medicolegal rules across States and relative to the U.S. health care system. In the volatile ED setting, reporting may be further complicated by situation-specific events. Consequently, the EM specialty must consider this when planning interventions and board exams to improve patient safety. [38, 39]

Limitations

Results from this study may not be generalizable to other States that might operate under a different standard of care. Additionally, we were unable to capture information on each trainee's ability to tolerate risk and uncertainty (e.g., risk-seeking vs. risk-avoiding personalities[40]). The small sample size precluded an ability to conduct statistical significance analyses among the demographic variables and each of the four main theme-based questions. The questionnaire used examples of adverse event injuries, but it did not consider threshold levels. For instance, past large-scale epidemiologic work[41, 42] has categorized adverse event outcomes into severity scale injury levels. Finally, the developed questionnaire was erroneously printed with a hospital (Memorial) where rotations did not occur. However, no respondents checked the "other" option to indicate rotation-based hospital work at area hospitals. Therefore, the error is presumed to have had a trivial effect on the validity of participants' responses.

Conclusion

This study assessed EM trainees' understanding and perceptions of adverse events and negligence in the State of Rhode Island, where practicing physicians and trainees abide by the

U.S. national standard of care. The physicians in training who were surveyed were cognizant of medical negligence and significantly concerned about its impact on clinical practice.

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Appendix: EM Trainee Patient Safety Questionnaire

PATIENT SAFETY QUESTIONNAIRE

DEFINITION OF ADVERSE EVENTS

Sometimes when people in the United States are ill and receive medical care, mistakes are made that result in complication or injury to a patient. When mistakes are made from medical management and NOT from the patient's underlying condition or disease, they are called adverse events. A few examples include pneumothorax, retained objects, hospital-acquired infections, decubitus ulcers, perioperative myocardial infarctions (MIs), line infections, and falls. The following questions are about adverse events.

1. **How important a problem do you think adverse events are in the United States today?**

   ☐ 1 Not at all important

   ☐ 2 Not important

   ☐ 3 Somewhat important

   ☐ 4 Very important

2. **When people seek help from a health care professional, how often do you think such adverse events are made in their care?**

   ☐ 1 Not often at all

   ☐ 2 Not often

   ☐ 3 Somewhat often

   ☐ 4 Very often

3. **How often do you think patients are at least partially responsible for adverse events made in their care?**

   ☐ 1 Not often at all

   ☐ 2 Not often

   ☐ 3 Somewhat often

   ☐ 4 Very often

4. **Should hospital reports of adverse events be confidential and only used to learn how to prevent future mistakes OR should they also be released to the public?**

   ☐ 1 Confidential (only used to learn how to prevent future mistakes)

   ☐ 2 Also released to the public

5. **Should physicians be required to tell patients if a adverse event resulting in serious harm is made in their care, OR not?**

   ☐ 1 Yes

   ☐ 2 No

Please continue to the next page

6. Which of the following do you think is the MOST important cause of adverse events? (Check one only.)

☐ 1 Mistakes made by nurses

☐ 2 Mistakes made by physicians

☐ 3 Mistakes made by other health professionals

7. Following is a list of some things that could cause preventable adverse events that result in serious harm to the patient. For each one, please indicate how important you think it is as a cause of these preventable adverse events.

	Not at all important (1)	Not important (2)	Somewhat important (3)	Very important (4)
a) Overwork, stress, or fatigue of health professionals	☐	☐	☐	☐
b) Health professionals not working together or not communicating as a team	☐	☐	☐	☐
c) Not enough nurses in hospitals	☐	☐	☐	☐
d) Poor supervision of health professionals	☐	☐	☐	☐

8. Following is a list of some possible solutions that have been proposed for adverse events that result in serious harm. Please indicate how effective you think each one would be in reducing preventable adverse events.

	Not at all effective (1)	Not effective (2)	Somewhat effective (3)	Very effective (4)
a) Providing coping support, for the health professional, when involved with an adverse event	☐	☐	☐	☐
b) Developing a system that quickly and fairly compensates an injured patient by an adverse event	☐	☐	☐	☐
c) Having adverse events be addressed in board certification examinations	☐	☐	☐	☐
d) Using an online adverse event reporting system	☐	☐	☐	☐

Please continue to the next page

OTHER ASPECTS OF MEDICINE

9. What does negligence mean?

_____

_____

10. Based on your definition from Q9, please provide two examples of an adverse event due to negligence:

a) _____

b) _____

11. Following is a list of some legal aspects of medicine. Based on your clinical experience, please indicate your view regarding each statement.

		Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)
a)	I have had to make significant changes in my practice pattern because of recent legal developments concerning medical delivery.	☐	☐	☐	☐
b)	I am concerned that I will be involved in a malpractice case sometime in the next 10 years.	☐	☐	☐	☐
c)	I feel pressured in my day-to-day practice by the threat of malpractice litigation.	☐	☐	☐	☐
d)	I order some tests or consultations simply to avoid the appearance of malpractice.	☐	☐	☐	☐
e)	Sometimes I ask for consultant opinions primarily to reduce my risk of being sued.	☐	☐	☐	☐
f)	Relying on clinical judgment rather than on technology to make a diagnosis is becoming riskier from a medicolegal perspective.	☐	☐	☐	☐

12. Have you ever been sued for malpractice?

☐ 1 Yes

☐ 2 No

Please continue to the next page

DEMOGRAPHIC INFORMATION

13. Are you male or female?

☐ 1 Male

☐ 2 Female

14. Which of the following describes your current training level?

☐ 1 Medical student

☐ 2 Intern

☐ 3 Resident

☐ 4 Attending

☐ 5 Other _____

15. Which of the following describes your current training year?

☐ 1 1

☐ 2 2

☐ 3 3

☐ 4 ≥4

16. What is your current training hospital?

☐ 1 Rhode Island

☐ 2 Memorial

☐ 3 Other _____

17. How old are you?

☐ 1 24 or less

☐ 2 25 to 29

☐ 3 30 to 34

☐ 4 35 to 39

☐ 5 40 or greater

18. If you were the researcher, what question would you like to ask to providers about adverse events?

_____

_____

Thank you very much for your time in participating in this study.

Please place this Questionnaire in the blank envelope provided. You may seal it.