

## Special Article

## RELATION BETWEEN NEGLIGENT ADVERSE EVENTS AND THE OUTCOMES OF MEDICAL-MALPRACTICE LITIGATION

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**ABSTRACT**

**Background** We have previously shown that in New York State the initiation of malpractice suits correlates poorly with the actual occurrence of adverse events (injuries resulting from medical treatment) and negligence. There is little information on the outcome of such lawsuits, however. To assess the ability of malpractice litigation to make accurate determinations, we studied 51 malpractice suits to identify factors that predict payment to plaintiffs.

**Methods** Among malpractice claims that we reviewed independently in an earlier study, we identified 51 litigated claims and followed them over a 10-year period to determine whether the malpractice insurer had closed the case. We obtained detailed summaries of the cases from the insurers and reviewed the litigation files if the outcome of a case differed from the outcome predicted in our original review.

**Results** Of the 51 malpractice cases, 46 had been closed as of December 31, 1995. Among these cases, 10 of 24 that we originally identified as involving no adverse event were settled for the plaintiffs (mean payment, \$28,760), as were 6 of 13 cases classified as involving adverse events but no negligence (mean payment, \$98,192) and 5 of 9 cases in which adverse events due to negligence were found in our assessment (mean payment, \$66,944). Seven of eight claims involving permanent disability were settled for the plaintiffs (mean payment, \$201,250). In a multivariate analysis, disability (permanent vs. temporary or none) was the only significant predictor of payment ( $P=0.03$ ). There was no association between the occurrence of an adverse event due to negligence ( $P=0.32$ ) or an adverse event of any type ( $P=0.79$ ) and payment.

**Conclusions** Among the malpractice claims we studied, the severity of the patient's disability, not the occurrence of an adverse event or an adverse event due to negligence, was predictive of payment to the plaintiff. (N Engl J Med 1996;335:1963-7.)

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THE accuracy of the litigation system governing medical malpractice in the United States is widely debated.<sup>1,2</sup> Many physicians assert that malpractice litigation is haphazard and that suits are brought with little regard to the quality of the care the plaintiff has received.<sup>3</sup> On the other hand, many advocates for consumers and patients argue that modifications in the law have made it so difficult for patients to prevail in such litigation that meritorious suits often bring little or no compensation to injured plaintiffs.<sup>4</sup>

Empirical investigations have confirmed the views of those on both sides of the debate. Many medical injuries caused by the negligence of a physician, all of which are theoretically compensable under malpractice law, do not result in claims.<sup>5,6</sup> The same or similar studies have also found that a substantial proportion of claims are brought when the plaintiff is theoretically not entitled to compensation — in cases involving no medical injury and no demonstrable negligence on the defendant's part.<sup>5,7</sup>

In the Harvard Medical Practice Study, we showed that medical-malpractice claims are rarely made after patients are injured negligently.<sup>8</sup> We also found that claims were relatively frequent when, according to our independent review of the medical records, no negligent injury had occurred. We were unable, however, to evaluate the overall ability of malpractice litigation to make accurate determinations, because we lacked information on the eventual outcomes of the cases. We realized that individual claims could be highly inaccurate but the overall system of litigation quite accurate, if it was true that only meritorious claims resulted in compensation, whereas nonmeritorious claims did not, as others have suggested.<sup>9,10</sup>

To address these issues, we conducted a 10-year follow-up of the malpractice claims identified in our prior study and analyzed the ability of the litigation to lead to payments on the basis of accurate determinations.

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## METHODS

### Review of Medical Records

Our methods of reviewing records and one sampling strategy have been reported in detail previously.<sup>11</sup> In brief, we used a two-stage sampling process to develop a representative sample of 31,429 records of hospitalized patients from a group of 2,671,863 patients not hospitalized for psychiatric diagnoses who were discharged from nonfederal, acute care hospitals in New York State during 1984. The records were first screened by trained nurses and medical-records analysts; records identified by the nurses as meeting 1 of 18 criteria for potential evidence of adverse events or negligence were reviewed independently by two physicians.

An adverse event was defined as an injury resulting from medical treatment, as opposed to the underlying disease process, that prolonged a patient's hospitalization, caused disability at the time of discharge, or both. An adverse event due to negligence was an injury judged to be due to medical care that failed to meet the standards expected of a typical medical practitioner. If evidence of an adverse event was found, a determination was subsequently made of whether there was evidence of negligence.

Physician reviewers assessed the degree of disability resulting from each medical injury on an eight-point scale, with the review taking place four years after the injury. Thus, the reviewers were able to assess disabilities that may not have been clearly evident at the time of the index hospitalization. The scores on the disability scale ranged from 1 (less than one month of temporary disability) to 8 (death resulting from the injury).

### Definition of Variables

Data on each patient's age, sex, race, insurer, ZIP Code, and primary diagnosis at hospital discharge were obtained from the data base of the New York Statewide Planning and Research Cooperative System.<sup>12</sup> Patients were categorized as insured (if they had private insurance, Medicare, Medicaid, other government insurance, or workers' compensation) or uninsured.

Data on median household income in 1984 according to ZIP Code, an indirect measure of income, were obtained from the New York State Commerce Department. Annual income was categorized as low (less than \$21,114) or high (at least \$21,114) on the basis of criteria used by the Bureau of the Census. Four categories of diagnosis-related groups (DRGs), developed by consensus among physicians, were used as measures of the severity of the patient's illness, to control for the inherent risk that a particular diagnosis would give rise to an adverse event.<sup>11</sup>

### Follow-up of Malpractice Claims

Formal malpractice claims against physicians and hospitals, including all requests for monetary damages, were reported to the Office of Professional Medical Conduct at the New York State Department of Health. The data base of that office included all 67,900 claims reported from 1975 through 1989. The claims records were then linked to the medical records under review by a matching process described elsewhere.<sup>7</sup> In the sample of 31,429 records, 51 malpractice claims were matched to hospitalizations — 47 claims that were identified in our earlier study and 4 that were identified in the follow-up of missing records.

Since 1991, one of us has contacted the malpractice insurers every six months about the status of these 51 claims. As the claims have been closed, we have sought a detailed summary of the litigation from the insurer in each case and have reviewed the claims files for eight of the nine cases rated as not involving negligence or an adverse event and in which payments of more than \$25,000 were made. The same study investigator also reviewed the files for all four cases rated as involving medical injuries due to negligence in which no payments had been made. This investigator remained unaware of the classification given each case in our earlier study and evaluated each litigation file to determine whether an adverse event or negligence had occurred. When there was a discrepancy between the original evaluation and the evalu-

ation during follow-up, the investigator also determined whether the case had been settled on the basis of its explicitly nonmedical features, such as the litigation strategy.

We present settlements in the following six categories: less than \$25,000, \$25,000 to \$49,999, \$50,000 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, and \$500,000 or above. To keep the insurers' records confidential, we do not give the exact amounts of specific settlements. For the same reason, we do not give details in discussing individual cases. The study was approved by the Human Subjects Committee of the Harvard School of Public Health.

### Statistical Analysis

The primary outcome was the type of settlement (payment vs. no payment). The predictor variables tested were disability rating, injury rating, type of insurance, race, age, physician's specialty, DRG category, and income. Disabilities were classified as temporary or permanent. In separate analyses, we created a group of patients who did not have permanent disabilities by combining those with temporary disabilities and those with no disabilities. Race was classified as black or any other race. Age was categorized as less than 21 years, 21 to 59 years, and 60 years or above. Physicians were categorized either as obstetricians or neonatologists or as having any other specialty.

We used the SAS statistical package to determine univariate and multivariate associations with regard to categorical data.<sup>13</sup> Univariate associations between the predictor variables and the type of settlement were determined by two-tailed Fisher's exact tests. To analyze the univariate effect of negligence, claims involving adverse events and negligence were compared with those not involving negligence. In a separate univariate analysis, all the claims involving adverse events were compared with the claims not involving adverse events.

Multivariate logistic regression was used to assess independent predictors of settlement. The model included the disability rating, the injury rating, the physician's specialty, and the patient's race, DRG category, age, and income as variables. Odds ratios and P values (two-tailed) are presented. Given the limited size of the sample, the findings of the multivariate analysis were confirmed by forward and backward elimination, a process in which variables are eliminated serially from the logistic regression, allowing their relative influence on the results to be tested.

## RESULTS

### Empirical Analysis

Of the 51 malpractice claims, 46 had been closed as of December 31, 1995. Twenty-one were settled with payment for the plaintiff (Table 1). There was one jury trial, resulting in a verdict for the defense. Among the 29 cases we originally identified as not involving adverse events, 5 remained open at least 11 years after the index hospitalization and 24 had been settled, with settlement for the plaintiff in 10. The mean award was \$28,760 (Table 2).

All 13 cases classified as involving adverse events but no negligence had been closed, with 6 (46 percent) ending in settlement for the plaintiff. The mean compensation in these cases was \$98,192, an amount greatly affected by one large settlement (Table 2).

The nine cases we rated as involving adverse events due to negligence had also all been closed. Five were settled for the plaintiff, with a mean compensation of \$66,944 (Table 2). Seven of eight claims in which the patient was permanently dis-

abled were settled for the plaintiff, with a mean settlement of \$201,250.

In univariate analyses, neither the presence of an adverse event nor that of an adverse event due to negligence was associated with the outcome of the litigation. Cases in which there was an adverse event were no more likely to end in a payment than those in which there was no adverse event ( $P=0.77$ ). Nor were cases in which there was an adverse event due to negligence more likely than those without such an event to end in a settlement for the plaintiff ( $P=1.0$ ).

The making of a payment was not associated with whether the claimant had health insurance ( $P=0.59$ ). There was a trend toward fewer payments among patients with lower income, however; 3 of 13 low-income patients (23 percent) received payments, as compared with 13 of 27 high-income patients (48 percent) ( $P=0.10$ ). There were no significant associations between payment and the age, DRG category, or race of the patient or the specialty of the physician.

In the univariate analyses, the one factor predicting that patients with adverse events would receive payment was the physician reviewer's rating of disability ( $P=0.02$ ). The results were similar when we compared patients who did not have permanent disabilities with those who did ( $P=0.02$ ).

In the multivariate analysis, disability (permanent vs. temporary or none) was the only significant predictor of payment ( $P=0.03$ ) (Table 3), a finding confirmed by the forward and backward elimination of variables. Neither the presence of an adverse event due to negligence ( $P=0.32$ ) nor the presence of an adverse event of any type ( $P=0.79$ ) was associated with payment to the plaintiff. There was still a trend toward fewer payments among low-income patients ( $P=0.10$ ).

We reviewed summary information from insurers on the eight cases that were settled for less than \$25,000. Most involved write-offs of expenses for medical care. The rest were one-time payments of small amounts of money. The records contained explicit statements that the cases were being settled in the most cost-effective manner.

**Discrepant Cases**

Our original findings and the outcomes of litigation were discrepant in 13 cases. The litigation strategy dictated the results in seven of these, in which the claims were settled without a finding of negligence or injury. Seasoned litigators are likely to settle cases when a key defendant is thought to be a very poor witness, when a key party in the case dies, or when a defendant gives conflicting testimony in different depositions. Even excellent cases can be difficult to win when extraneous issues make the plaintiff or the defendant appear unsympathetic. Or the defendant may delay the case and the plaintiff may die before the case goes to trial.

The dynamics of insurance coverage had a role in

**TABLE 1. FINDINGS IN 46 CLOSED CASES INVOLVING MALPRACTICE CLAIMS.**

CASE NO.	PLAINTIFF'S AGE AT INJURY (YR)	DISABILITY SCORE*	TYPE OF INSURANCE†	PAYMENT RANGE (\$)
<b>Cases with adverse events</b>				
1	27	7	Private	25,000–49,999
2	54	1	Private	0
3	17	4	Private	0
4	63	1	Other	0
5	65	5	Medicare	0
6	29	7	Medicaid	<25,000
7	16	2	Private	250,000–499,999
8	0	1	Medicaid	<25,000
9	33	2	Private	0
10	45	3	Medicaid	0
11	68	2	Private	25,000–49,999
12	19	5	Private	≥500,000
13	58	2	Private	0
<b>Cases without adverse events</b>				
14	63	0	Medicare	100,000–249,999
15	26	0	Private	<25,000
16	29	0	Private	0
17	19	0	Medicaid	0
18	54	0	Private	<25,000
19	52	0	Private	0
20	23	0	Uninsured	<25,000
21	57	0	Private	250,000–499,999
22	64	0	Private	0
23	63	0	Medicare	0
24	44	0	Private	0
25	38	0	Medicaid	<25,000
26	66	0	Private	0
27	65	0	Private	0
28	28	0	Private	0
29	61	0	Medicare	0
30	48	0	Uninsured	50,000–99,999
31	47	0	Private	0
32	59	0	Private	50,000–99,999
33	51	0	Private	0
34	65	0	Medicare	25,000–49,999
35	0	0	Medicaid	<25,000
36	0	0	Medicaid	0
37	26	0	Other	0
<b>Cases with adverse events due to negligence</b>				
38	28	2	Uninsured	0
39	54	2	Private	0
40	57	4	Private	0
41	61	7	Private	100,000–249,999
42	62	5	Private	25,000–49,999
43	52	7	Private	<25,000
44‡	29	1	Private	0
45	21	1	Other	100,000–249,999
46	28	7	Private	100,000–249,999

\*The disability scores were defined as follows: 1, temporary disability for less than one month; 2, temporary disability for one to three months; 3, temporary disability for more than three months to six months; 4, temporary disability for more than six months; 5, minimal permanent disability; 6, moderate permanent disability; 7, permanent support needed; and 8, death.

†“Other” denotes workers’ compensation or government insurance other than Medicare and Medicaid.

‡This case was the only one of those studied that was decided by a jury.

**TABLE 2.** DISPOSITION OF CLAIMS ACCORDING TO THE RATING OF THE PLAINTIFF'S INJURY AND DEGREE OF DISABILITY.

RATING	NO. OF CLOSED CASES	SETTLED FOR PLAINTIFF	MEAN SETTLEMENT
		no. (%)	\$
Type of injury			
No adverse event	24	10 (42)	28,760
Adverse event	13	6 (46)	98,192
Negligent adverse event	9	5 (56)	66,944
Disability			
None	24	10 (42)	28,760
Temporary	14	4 (29)	38,857
Permanent	8	7 (88)	201,250
All claims	46	21 (46)	55,853

**TABLE 3.** LOGISTIC-REGRESSION ANALYSIS OF PREDICTORS THAT A CLAIM WOULD BE SETTLED IN FAVOR OF THE PLAINTIFF.

PREDICTOR*	ODDS RATIO (95% CONFIDENCE INTERVAL)	P VALUE
Permanent disability	29.7 (1.41–621.4)	0.03
Negligent adverse event	0.2 (0.01–4.1)	0.32
Adverse event	0.7 (0.1–7.1)	0.79
Low income	0.1 (0.0–1.5)	0.10
Black race	1.0 (0.1–15.0)	0.97
Age		
<21 yr	0.6 (0.0–10.6)	0.73
>59 yr	1.8 (0.2–17.5)	0.61

\*The comparison groups were no permanent disability, no adverse event, high income, non-black race, and age of 21 to 59 years. We also controlled for the DRG category as a measure of the severity of disease, and for the specialty of the physician. These variables are further defined in the Methods section.

the settlements in three discrepant cases not involving negligence or injury. For example, a case can be settled if two insurers — such as a malpractice insurer and an automobile insurer in a case involving a malpractice claim brought by a patient originally injured in an automobile accident — reach an agreement on how to share the payment, and the payment required of the malpractice insurer is much less than that requested by the plaintiff. Insurers may also settle claims, especially claims initiated in the mid-1980s, in situations in which the excess-liability insurer of the malpractice insurer (the reinsurer) has gone bankrupt and the malpractice insurer does not wish to incur the risk of a large loss.

Serious injuries can lead to settlements even when there is no negligence, as happened in one case involving a neurologic injury that followed a vascular procedure. In that case, the patient's injuries were so

serious that the insurer thought the jury would compensate the patient, even though the medical care met the expected standard. Finally, in two cases certain medical records were unavailable to our reviewer but available to the litigants, and in both cases the finding differed from our original assessment.

If we reclassify these last three cases so that two are considered to have resulted from adverse events due to negligence and the third is thought not to have involved an adverse event (and we adjust the disability ratings appropriately), the mean settlement for claims not involving adverse events is \$23,552. For claims involving adverse events, the mean settlement is then \$31,375, and for claims involving negligent adverse events it is \$162,750. In a multivariate analysis of these data, neither the presence of negligence ( $P=0.59$ ) nor the presence of an adverse event ( $P=0.92$ ) was predictive of payment. Permanent disability remained predictive, however ( $P=0.02$ ).

## DISCUSSION

The malpractice cases we studied are typical of those litigated in the United States in the past decade. Approximately 40 percent were settled with some payment to the plaintiff. One went to a jury trial. The average settlement was just over \$40,000. These figures are in line with national estimates.<sup>4,14</sup>

Our physician reviewers performed independent assessments of the medical records relevant to each litigated claim. The results of these follow-up assessments of whether negligence or a medical injury had occurred 10 years earlier bore little relation to the outcome of the claims, just as in our earlier study they were found to bear little relation to the initial decision to file the claims.<sup>8</sup> We found that the severity of the patient's disability was predictive of payment to the patient. Earlier studies of this question have had mixed conclusions. Sloan had similar findings regarding patients recovering from injuries received during neonatal and emergency care.<sup>7</sup> Taragin and coauthors found, after studying insurers' case abstracts, that disability did not predict payment.<sup>15</sup>

Our previous analyses suggested that patients with high incomes are more likely to file malpractice claims.<sup>12</sup> In the current analysis, high income was not a significant predictor of payment, although there was a trend in that direction ( $P=0.10$ ). This outcome seems sensible in view of the dynamics of litigation. A poor person may have difficulty securing an attorney,<sup>7</sup> but after the attorney is found, income may no longer be an important determinant of payment. It is possible that claimants with lower incomes would receive smaller payments, but our set of data was too small to answer this question.

We treated the litigation file as the gold standard by which the claims should be judged. In our experience, these confidential records contain the insurers' honest assessments of the patients' injuries, even

when the insurers vigorously pursue a litigation strategy at odds with those assessments. It would not be useful to the insurer to indicate that no negligence had occurred when the evidence suggested the contrary. In most cases, our initial assessments of the medical records agreed with the expert assessments by the insurers. There were only three cases in which our initial judgment based on the insurance file disagreed with the later decision recorded in the litigation file. Reclassifying these cases did not change our main findings.

Our review uncovered examples of the "art" of litigation. In some cases there were substantial settlements only because the physicians in question would have made poor witnesses; in others, there was a tenacious defense even though negligence was privately acknowledged; and in still others, the cases were prolonged as part of a legal strategy. Such maneuvers are accepted as part of the art of litigation. Nonetheless, they raise questions about whether tort law is the most effective system of compensating injured patients and creating rational mechanisms of preventing injuries.<sup>5</sup>

Our results call into question why the U.S. tort system persists in making determinations of negligence when compensation for medical injury is being considered. If the permanence of a disability, not the fact of negligence, is the reason for compensation, the determination of negligence may be an expensive sideshow.<sup>5</sup> It may pollute the compensation process by creating an adversarial atmosphere and may interfere with quality-improvement efforts.<sup>16</sup>

The determination of negligence does have its advocates, however. Drawing on studies showing that defendants are more likely to settle cases that they believe involve negligence, White has argued that using this criterion creates incentives for high-quality care.<sup>17</sup> Studies supporting this approach have relied on case summaries prepared by physicians, hospitals, and their lawyers<sup>18</sup>; computerized summaries from insurance companies<sup>15</sup>; or case abstracts completed by anesthesiologists and based on closed claims files.<sup>19</sup> It makes sense to expect a relation between insurers' decisions about the defensibility of the care provided and payment to plaintiffs.

The real test of the use of negligence as a criterion in litigation is its ability to prevent unsafe medical practices, an issue very difficult to address through research.<sup>20</sup> Studies that have tried to measure deterrence have been largely inconclusive.<sup>5,7</sup> Overall, empirical evidence does not strongly support using the negligence standard to prevent medical injury.

There are several limitations of our study. It is based on only 46 settled cases. Our findings could reflect only litigation practices in New York in 1984 and may not be generalizable. We are conducting a similar study in Colorado and Utah for 1992, which should provide insight into the generalizability of

these findings. Finally, we did not review all discrepant records in detail. Our discussions with insurers indicated that settlements of less than \$25,000 were nuisance settlements — settlements of claims thought to be without merit that could be resolved with a relatively small payment. We did not corroborate this with plaintiffs' attorneys, however.

Nonetheless, our results suggest that the standard of medical negligence performs poorly in malpractice litigation. Some states have undertaken reforms<sup>21</sup> involving no-fault compensation for medical injuries, and others are exploring such reforms.<sup>22</sup> These projects should be carefully evaluated; they may be better than the present system at compensating injured patients and deterring preventable injuries.

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