
Personal Consequences of Malpractice Lawsuits on American Surgeons

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- BACKGROUND:** Our objective was to identify the prevalence of recent malpractice litigation against American surgeons and evaluate associations with personal well-being. Although malpractice lawsuits are often filed against American surgeons, the personal consequences with respect to burnout, depression, and career satisfaction are poorly understood.
- STUDY DESIGN:** Members of the American College of Surgeons were sent an anonymous, cross-sectional survey in October 2010. Surgeons were asked if they had been involved in a malpractice suit during 2 previous years. The survey also evaluated demographic variables, practice characteristics, career satisfaction, burnout, and quality of life.
- RESULTS:** Of the approximately 25,073 surgeons sampled, 7,164 (29%) returned surveys. Involvement in a recent malpractice suit was reported by 1,764 of 7,164 (24.6%) responding surgeons. Surgeons involved in a recent malpractice suit were younger, worked longer hours, had more night call, and were more likely to be in private practice (all $p < 0.0001$). Recent malpractice suits were strongly related to burnout ($p < 0.0001$), depression ($p < 0.0001$), and recent thoughts of suicide ($p < 0.0001$) among surgeons. In multivariable modeling, both depression (odds ratio = 1.273; $p = 0.0003$) and burnout (odds ratio = 1.168; $p = 0.0306$) were independently associated with a recent malpractice suit after controlling for all other personal and professional characteristics. Hours worked, nights on call, subspecialty, and practice setting were also independently associated with recent malpractice suits. Surgeons who had experienced a recent malpractice suit reported less career satisfaction and were less likely to recommend a surgical or medical career to their children ($p < 0.0001$).
- CONCLUSIONS:** Malpractice lawsuits are common and have potentially profound personal consequences for US surgeons. Additional research is needed to identify individual, organizational, and societal interventions to support surgeons subjected to malpractice litigation. (J Am Coll Surg 2011; 213:657–667. © 2011 by the American College of Surgeons)
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Burnout, decreased career satisfaction, and personal distress are common problems for US surgeons.^{1–6} Recent studies suggest that surgeon burnout can adversely affect the quality of care surgeons provide and can have potentially profound personal implications, including suicidal ideation.^{7,8} Physicians are at greater risk for death by suicide than other professionals.^{9,10} In addition to the traditional risk factors for suicide, occupational risks, such as burnout or making a medical error, appear to increase risk for sur-

geons.^{7,11,12} Other contributing factors are not fully understood.

One feature of surgical life that can precipitate profound distress is being sued for malpractice by a patient or their family. Remarkably, >42% of all US physicians have been sued for malpractice, according to a 2007–2008 survey conducted by the AMA.¹³ The AMA survey found that the specialties with the greatest incidence of claims were general surgery and obstetrics/gynecology (each nearly 70%) and that other surgical subspecialties also had a high likelihood of being sued (57%). Strikingly, 90% of surgeons aged 55 years and older had been sued during their career.¹³

The personal consequences of malpractice litigation on the individual surgeon are poorly understood. One study of 72 surgical oncologists at a single academic center reported that almost three-quarters of participants have been sued and more than half said that the lawsuit was highly stressful.¹⁴ In this study, the stress caused by malpractice

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Abbreviations and Acronyms

ACS = American College of Surgeons

MBI = Maslach Burnout Inventory

OR = odds ratio

QOL = quality of life

lawsuits was associated with burnout and was rated as a source of stress equivalent to that of financial worries, pressure to succeed in research, work/home conflicts, and coping with patients' suffering and death.¹⁴

We previously reported on the interrelations between burnout, depression, medical errors, and suicidal ideation among US surgeons based on a survey conducted under the auspices of the American College of Surgeons (ACS) in 2008.^{1,7,8} In 2010, we conducted a follow-up survey of ACS members that included questions about surgeons' recent experience with medical malpractice lawsuits to evaluate potential personal consequences.

METHODS**Participants**

Study eligibility and administration process were identical to our 2008 ACS study.^{1,3,6,7} All surgeons who were members of the ACS had an email address on file with the college, and permitted their email address to be used for correspondence with the college were eligible for participation in this study. Participation was elective and all responses were anonymous. The study was commissioned by the ACS Governor's Committee on Physician Competency and Health with IRB oversight with respect to protection of human subjects by the Mayo Clinic IRB.

Data collection

Surgeons were surveyed electronically in October 2010. A cover letter stated the purpose of the survey was to better understand the factors that contribute to career satisfaction among surgeons. Participants were blinded to any specific hypothesis of the study. The survey included approximately 60 questions about a wide range of characteristics, including demographic information, practice characteristics, burnout, quality of life (QOL), symptoms of depression, and career satisfaction. Up to 3 follow-up email messages reminded surgeons to complete the survey.

Validated survey tools were used to identify burnout, mental and physical QOL,^{15,16} and symptoms of depression.^{17,18} The 22-item Maslach Burnout Inventory (MBI) is the gold standard for the assessment of burnout¹⁹⁻²¹; however, its length (22 items) limits its use in long surveys addressing multiple topics with space constraints. Many

burnout studies have focused on the presence of high levels of either emotional exhaustion or depersonalization as the foundation of burnout among physicians.^{22,23} Accordingly, in this study, symptoms of burnout were assessed using 2 single-item measures adapted from the full MBI. Emotional exhaustion was assessed by the question, "How often do you feel burned out from your work?" Depersonalization was assessed by the question, "How often do you feel you've become more callous toward people since you started your residency?" Each question was answered on a 7-point Likert scale with response options ranging from "Never" to "Daily." These single items have been shown to correlate strongly with the Emotional Exhaustion and Depersonalization domains of burnout as measured by the full MBI in a sample of >10,000 medical students, residents, and practicing physicians.²⁴

In accord with the validated approach, symptoms of high emotional exhaustion were defined by a frequency of feeling burned out from work of at least once a week.²⁴ Similarly, symptoms of high depersonalization were defined by a frequency of feeling more callous toward people of at least once a week. The area under the receiver operating characteristic curve for the emotional exhaustion and depersonalization single items against their respective full MBI domain measure in previous studies were 0.94 and 0.93. The positive predictive values of the single-item thresholds for high levels of emotional exhaustion and depersonalization were 88.2% and 89.6%, respectively, with positive likelihood ratios of 14.9 and 23.4.²⁴ When compared with the full MBI domain scores in studies of medical students, residents, and practicing physicians, these single-item measures have also been shown to provide similar estimates of effect for associations between burnout and key outcomes, including subsequent self-reported major medical errors, suicidality, and professional behaviors (unpublished data).

Symptoms of depression were identified using the 2-item Primary Care Evaluation of Mental Disorders (PRIME MD),¹⁷ a standardized depression screening tool that performs as well as longer instruments.¹⁸ QOL was measured by a single-item linear analog self-assessment in a variety of domains including mental, physical, and overall QOL. Each QOL domain was assessed on a 0 to 10 scale, with response anchors ranging from "As bad as it can be" (0) to "As good as it can be" (10). Linear analog self-assessment instruments have been extensively validated and are widely used in QOL research.²⁵⁻²⁸ Population-based normative data suggest that mean scores on QOL instruments for healthy individuals are generally >70 when scaled to a 0 to 100 range (eg, ≥ 7 on a 0 to 10 scale).^{16,29} Recent suicidal ideation was evaluated by asking

surgeons, "During the past 12 months have you had thoughts of taking your own life?"⁸ This question, first developed by Meehan and colleagues,³⁰ has been used in earlier studies of US physicians and medical students^{8,31} and allows ready comparison with the prevalence of suicidal ideation in the general US population.³²

Additional questions were developed to explore demographic factors and professional characteristics. Two questions, based on similar measures from previous physician surveys, were used to assess career satisfaction.^{27,33-37} One question asked, if given the opportunity to revisit their career choice, "would you choose to become a physician again?" (career choice). A second question asked, if given the opportunity to revisit their career choice, "would you choose to be a surgeon again?" (specialty choice). Response options included "definitely not," "probably not," "not sure, neutral," "probably," and "definitely yes." Surgeons with children were also asked whether they would recommend their children pursue a career as a physician or surgeon using the same response options. Responses of "probably" or "definitely yes" to these questions were considered to indicate greater career satisfaction. Recent involvement in malpractice litigation was evaluated by asking surgeons, "Have you gone through a medical malpractice suit in the last 2 years?"

Statistical analysis

Descriptive statistics were used to characterize sample demographics. Comparisons between surgeons involved in recent malpractice litigation and surgeons without such experience were tested using Wilcoxon Mann-Whitney tests and Fisher's exact tests. Such comparisons with 5,400 and 1,764 surgeons reporting in the 2 groups have 95% power to detect an average difference of one-twenty-fifth the standard deviation, a small effect size.^{38,39} Accordingly, the *p* values in this report are not as important as the observed effect sizes. Consistent with recent advances in the science of QOL assessment,³⁸ we a priori defined a one-half standard deviation in QOL scores as a clinically meaningful effect size.^{38,39} Linear regression was used to evaluate the incremental relationship of each measure of distress with recent malpractice suits. In addition, the odds ratio for involvement in recent malpractice litigation associated with screening positive for depression, experiencing burnout, each 1 increment change in burnout or QOL score, and career satisfaction items was calculated. The multivariable associations among demographic characteristics, professional characteristics, and distress with recent malpractice suit involvement were assessed using logistic regression. Both forward and backward elimination methods were used to select significant variables for the models where the directionality of the modeling did not impact the results.

The independent variables used in this model included age, sex, relationship status, children, specialty area, size of community, years in practice, hours worked per week, number of nights on call per week, practice setting, and burnout (high on either Emotional Exhaustion or Depersonalization scale). All analyses were done using SAS version 9 (SAS Institute Inc.) or R (R Foundation for Statistical Computing).

RESULTS

Of the approximately 67,349 Fellows and Associate Fellows (surgeons in their first year of practice) in the ACS at the time of the survey, 27,457 had an email address on record with the college and permitted use of their email address for purposes of correspondence. Of these 27,457, a correct email address could be confirmed on the initial mailing for approximately 91.3% (*n* = 25,073) of whom 7,197 (28.7%) eventually returned surveys. The demographic and practice characteristics of the study participants are summarized in Table 1. Approximately 60.5% of the study participants were age 50 years or older and 14.6% were women. Based on official ACS data about the demographics of US members in 2010, 73% of all ACS members are age 50 years or older and 8% are women. With respect to symptoms of burnout, 1,640 (22.9%) of surgeons reported symptoms of emotional exhaustion weekly and 1,053 (14.9%) reported symptoms of depersonalization weekly. At least 1 symptom of depression was reported by 1,925 (39%) surgeons and 330 (4.6%) reported they had considered suicide within the last 12 months.

Collectively, 1,764 (24.6%) surgeons reported involvement in a malpractice suit within the 24 months before the survey. The relationship between recent malpractice suit involvement and personal and professional characteristics is shown in Table 2. Those surgical specialties with the highest rate of a recent malpractice were neurologic (31%), cardiothoracic (29%), general (28%), colorectal (28%), and obstetrics and gynecology (28%), and the lowest rate specialties were otolaryngology (12%), ophthalmology (12%), and breast surgery (14%). Surgeons who experienced a recent malpractice action were younger, more likely to be male, worked more hours per week, had more frequent night call, and were more likely to be in private practice (all *p* < 0.0001).

The relationship between recent malpractice suit involvement and surgeon burnout, quality of life, depression, and career satisfaction are shown in Table 3 and Figure 1. When comparing surgeons who experienced a malpractice suit in the previous 24 months (*n* = 1,764) with those who did not (*n* = 5,400), higher rates of burnout (31.9% vs 25.2%; odds ratio [OR] = 1.39; *p* < 0.0001), symptoms of

Table 1. Personal and Professional Characteristics (n = 7,197)

Personal characteristics	
Age, y	
Median (Q1, Q3)*	53 (45,61)
Sex	
Missing, n	32
Male, n (%)	6,116 (85.4)
Female, n (%)	1,049 (14.6)
Relationship status	
Missing, n	36
Single, n (%)	583 (8.1)
Married, n (%)	6,311 (88.1)
Partnered, n (%)	216 (3)
Widowed or widower, n (%)	51 (0.7)
Have children [†]	
Missing, n	17
Yes, n (%)	6,384 (88.9)
No, n (%)	796 (11.1)
Professional characteristics	
Specialty	
Missing, n	40
Breast, n (%)	285 (4)
Cardiothoracic, n (%)	436 (6.1)
Colorectal, n (%)	264 (3.7)
General, n (%)	2,737 (38.2)
Neurology, n (%)	164 (2.3)
Obstetrics and gynecology, n (%)	83 (1.2)
Oncologic, n (%)	227 (3.2)
Ophthalmologic, n (%)	152 (2.1)
Orthopaedic, n (%)	149 (2.1)
Otolaryngology, n (%)	409 (5.7)
Pediatric, n (%)	224 (3.1)
Plastic, n (%)	370 (5.2)
Transplant, n (%)	124 (1.7)
Trauma, n (%)	324 (4.5)
Urologic, n (%)	306 (4.3)
Vascular, n (%)	460 (6.4)
Other, n (%)	440 (6.1)
Size community practice in	
Missing, n	55
≤5,000, n (%)	70 (1)
5,001–20,000, n (%)	420 (5.9)
20,001–50,000, n (%)	574 (8)
50,001–100,000, n (%)	914 (12.8)
100,001–500,000, n (%)	1,948 (27.3)
>500,000, n (%)	3216 (45)
Years in practice	
Median (Q1, Q3)*	20 (10,28)
Missing, n	204
<10 y, n (%)	1,489 (21.3)

Table 1. Continued

10–19 y, n (%)	1,963 (28.1)
20–30 y, n (%)	2,353 (33.6)
>30 y, n (%)	1,188 (17)
Hours worked per week	
Median (Q1, Q3)*	60 (50,70)
Missing, n	408
<40, n (%)	575 (8.5)
40–49, n (%)	651 (9.6)
50–59, n (%)	1,281 (18.9)
60–69, n (%)	2,308 (34)
70–79, n (%)	909 (13.4)
≥80, n (%)	1,065 (15.7)
No. of nights on call per week	
Median (Q1, Q3)*	2 (1, 4)
Primary practice setting	
Missing, n	192
Private practice, n (%)	3,723 (53.1)
Academic medical center, n (%)	2,108 (30.1)
Veterans Affairs hospital, n (%)	161 (2.3)
Active military practice, n (%)	94 (1.3)
Not in practice or retired, n (%)	195 (2.8)
Other, n (%)	724 (10.3)
Malpractice suit last 2 y	
Yes, n (%)	1,764 (24.6)
No, n (%)	5,400 (75.4)

*Q1 is the lower 25th percentile and Q3 is the upper 75th percentile.

[†]Only asked of surgeons indicating they currently are married or partnered.

depression (46.6% vs 36.9%; OR = 1.49; $p < 0.0001$), and suicidal ideation (6.4% vs 4.0%; OR = 1.64; $p < 0.0001$) were observed among those with a recent malpractice suit (Table 4). Surgeons who had experienced a recent malpractice suit also had lower mean overall, physical, and mental QOL scores, and less career satisfaction (Table 4). Both the Emotional Exhaustion and Depersonalization domains of burnout were strongly associated with a recent malpractice suit ($p < 0.0001$, Fig. 1). Surgeons who had experienced a recent malpractice suit had less career satisfaction and were also less likely to recommend a surgical or medical career to their children ($p < 0.0001$).

Finally, we performed multivariable logistic modeling to identify factors independently associated with recent malpractice suits. Depression (OR = 1.273, $p = 0.0003$) and burnout (OR = 1.168, $p = 0.0306$) were strongly and independently associated with malpractice suits after controlling for other personal and professional characteristics (Table 4). Hours worked per week, number of nights on call per week, subspecialty, and practice setting were also associated with recent malpractice suit involvement after controlling for other factors. The likelihood ratio test was highly significant ($p < 0.0001$), indicating that the model

Table 2. Relationship between Personal and Professional Factors and Recent Malpractice Suit

	Malpractice suit last 2 y		No malpractice suit last 2 y		p Value
	n	%	n	%	
Age, y					<0.0001
<35	17	8.4	185	91.6	
35–44	411	25.7	1,190	74.3	
45–54	608	27.0	1,644	73	
55–64	540	25.9	1,547	74.1	
≥65	188	18.4	834	81.6	
Sex					0.0097
Missing	2		14		
Male	1,537	25.2	4,563	74.8	
Female	225	21.5	823	78.5	
Relationship status					0.8476
Missing	7		23		
Single	151	25.9	432	74.1	
Married	1,544	54.6	4,740	75.4	
Partnered	50	23.2	166	76.9	
Widowed or widower	12	23.5	39	76.5	
Have children					0.3359
Missing	0		1		
Yes	1,579	24.8	4,788	75.2	
No	185	23.2	611	76.8	
Specialty					<0.0001
Missing	14		26		
Breast	40	14.2	242	85.8	
Cardiothoracic	127	29.2	308	70.8	
Colorectal	73	27.7	191	72.3	
General	776	28.5	1,948	71.5	
Neurologic	51	31.3	112	68.7	
Obstetrics and gynecology	23	27.7	60	72.3	
Oncologic	50	22	177	78	
Ophthalmologic	18	11.9	133	88.1	
Orthopaedic	36	24.5	111	75.5	
Otolaryngology	50	12.3	356	87.7	
Pediatric	51	22.8	173	77.2	
Plastic	78	21.3	288	78.7	
Transplantation	23	18.5	101	81.5	
Trauma	86	26.7	236	73.3	
Urologic	62	20.3	243	79.7	
Vascular	110	23.9	350	76.1	
Other	96	21.9	342	78.1	
Size community practice in					0.2821
Missing	10		40		
≤5,000	18	26.1	51	73.9	
5001–20,000	104	24.8	316	75.2	
20,001–50,000	158	27.5	416	72.5	
50,001–100,000	244	26.8	668	73.2	
100,001–500,000	461	23.8	1,476	76.2	
>500,000	769	24.0	2,433	76	

(continued)

Table 2. Continued

	Malpractice suit last 2 y		No malpractice suit last 2 y		p Value
	n	%	n	%	
Years in practice					<0.0001
Missing	49		140		
<10	308	20.8	1,175	79.2	
10–19	566	28.9	1,393	71.1	
20–30	599	25.5	1,749	74.5	
>30	242	20.4	943	79.6	
Hours worked per week					<0.0001
Missing	98		307		
<40	83	14.5	491	85.5	
40–49	156	24.0	494	76	
50–59	286	22.4	991	77.6	
60–69	599	26.0	1,703	74	
70–79	237	26.1	671	73.9	
≥80	305	29.1	743	70.9	
No. of nights on call per week					<0.0001
≥Median*	1,161	27	3,140	73	
<Median	506	20.8	1,932	79.2	
Primary practice setting					<0.0001
Missing	140		35		
Private practice	1,010	27.2	2,705	72.8	
Academic medical center	493	23.5	1,608	76.5	
Veterans hospital	19	11.8	142	88.2	
Active military practice	12	12.9	81	87.1	
Not in practice or retired	25	12.8	170	87.2	
Other	170	23.5	554	76.5	

*Median = 2 nights/week.

was a good fit to the data. Compared with general surgery as a specialty, 7 subspecialties had a lower risk of recent malpractice, and none had a higher risk (Table 4). Surgeons in active military practice or at a Veteran's Affairs hospital had a lower risk for experiencing a recent malpractice, but there was no difference between those in a private or academic practice setting (Table 4).

DISCUSSION

This national study of >7,000 American surgeons highlights the emotional toll of malpractice litigation on physicians. In addition to the considerable time away from practice associated with lawsuits, the tort process is inherently accusatory and has profound effects on QOL. Both the frequency of malpractice lawsuits and the adverse associations with surgeons' mental QOL, burnout, career satisfaction, and suicidal ideation emphasize another occupational risk factor that can adversely impact surgeons' personal health.^{1,6,7} Although it is not surprising that experiencing a malpractice lawsuit is associated with distress,

including burnout and depression, there are scant data on this topic in the medical literature. The prevalence of malpractice suits, impact on multiple dimensions of physician distress, including suicidal ideation, and the magnitude of effect observed in this national study of US surgeons is striking. The previously noted adverse affect of malpractice suits on career satisfaction appears to impact not only the surgeon's personal experience but also whether or not they would recommend their children pursuing a career as a physician or surgeon.⁴⁰

Recent malpractice suits were strongly associated with burnout, which has previously shown a strong association with increased risk of medical errors.^{7,28,41} Although we are unable to determine the potential direction of effect (eg, whether burnout contributes to an increased risk of malpractice suits or vice versa) in this cross-sectional study, we have previously found a bidirectional relationship between burnout and medical errors.⁴¹ Because physician burnout can result in poor judgment in patient care decision-making, hostility toward patients, adverse patient events,

Table 3. Associations between Malpractice Suit in Last 2 Years and Career Satisfaction

	Malpractice suit in last 2 years (n = 1,764)	No malpractice suit in last 2 years (n = 5,400)	Odds ratio*	p Value
Burnout				
High EE score, [†] n (%)	482 (27.5)	1,148 (21.4)	1.39	<0.0001
High DP score, [‡] n (%)	332 (19.2)	719 (13.6)	1.51	<0.0001
Burned-out, [§] n (%)	561 (31.9)	1,353 (25.2)	1.39	<0.0001
Positive depression screen, n (%)	817 (46.6)	1,981 (36.9)	1.49	<0.0001
Suicidal ideation last year, n (%)	112 (6.4)	215 (4)	1.64	<0.0001
Quality of life				
Overall QOL score, mean	7.2	7.5	—	<0.0001
Mental QOL score, mean	6.9	7.3	—	<0.0001
Physical QOL score, mean	6.7	7.0	—	<0.0001
Career satisfaction, n (%)				
Would become physician again	1,226 (69.6)	4,087 (75.8)	0.73	<0.0001
Would become surgeon again	1,343 (76.2)	4,300 (79.8)	0.82	0.0014
Recommend children pursue career as physician [¶]	863 (55)	2,930 (61.5)	0.81	<0.0001
Recommend children pursue career as surgeon [¶]	695 (44.3)	2,419 (50.8)	0.80	<0.0001

*Odds ratio >1 indicates increased risk among those with a malpractice suit; odds ratio <1 indicates lower likelihood among those with a recent malpractice suit.

[†]Individuals indicating symptoms of emotional exhaustion weekly or more often have median Emotional Exhaustion (EE) scores on the full Maslach Burnout Inventory (MBI) of >30 and have a >75% probability of having a high EE score as defined by the MBI (≥ 27).

[‡]Individuals indicating symptoms of depersonalization weekly or more often have median Depersonalization (DP) scores on the full MBI of >13 and have a >85% probability of having a high DP score as defined by the MBI (≥ 10).

[§]High score (\geq weekly) on Emotional Exhaustion and/or Depersonalization scale (see Methods).

[¶]Only asked of surgeons indicating they have children.

QOL, quality of life.

less compassion, and diminished commitment and dedication to productive, safe, and optimal patient care.^{1,7,41-43} It seems intuitive to hypothesize a similar bidirectional relationship between burnout and malpractice litigation.

Overall annual medical liability system costs, including defensive medicine, have been estimated by some investigators to be \$55.6 billion in 2008 dollars, or 2.4% of total health care spending.⁴⁴ Despite this staggering total, data from malpractice liability insurers suggests that a majority of malpractice claims are without merit, where nearly two-thirds of claims are dropped, withdrawn, or dismissed.⁴⁵ Medical malpractice litigation infrequently compensates patients injured by medical negligence and uncommonly identifies and holds providers accountable for substandard care.⁴⁶ Of the 10% of claims that are decided by a trial verdict, nearly 90% are decided in favor of the physician.⁴⁵ Despite this fact, the risk of malpractice litigation adversely affects access to care, particularly for certain surgical specialties and obstetrics and gynecology.^{40,47} It is also notable that overhead costs of malpractice litigation are exorbitant, where 54 cents of every dollar from malpractice compensation goes to administrative expenses, eg, lawyer fees, expert testimony, and court fees.⁴⁹ The T process of claims and litigation can take an average of 5 years to resolve and can have a protracted impact on the physician.⁴⁸

A majority of physicians also report ordering tests and/or consultations simply to avoid the risk of litigation (ie, defensive medicine), which profoundly increases the cost of care.⁴⁹ In 2003, the Department of Health and Human Services estimated that defensive medicine increased the cost of medical care from between \$70 to \$126 billion per year.⁵⁰ The nonpartisan Congressional Budget Office concluded that hospital spending per Medicare beneficiary decreased by 4% to 5% in states where noneconomic damages for malpractice are capped.⁵¹

Our study is subject to a number of limitations. First, recent malpractice suit involvement was assessed by self-report, and we did not distinguish the nature of the litigation (eg, error/delay in diagnosis, failure to treat, etc), the number of suits, or their outcomes (eg, dismissed, settled, tried to verdict). As noted, we are also unable to determine if the associations between malpractice suits and distress are causally related or the potential direction of the effects in this cross-sectional study. It is unknown whether surgeons experiencing a malpractice suit were less likely to respond to the survey because of apathy/distress or more likely to respond because the topic is of greater relevance to them. Although most earlier reports have assessed the proportion of surgeons who experienced a malpractice suit during their career,¹³ the proportion of surgeons reporting a malpractice

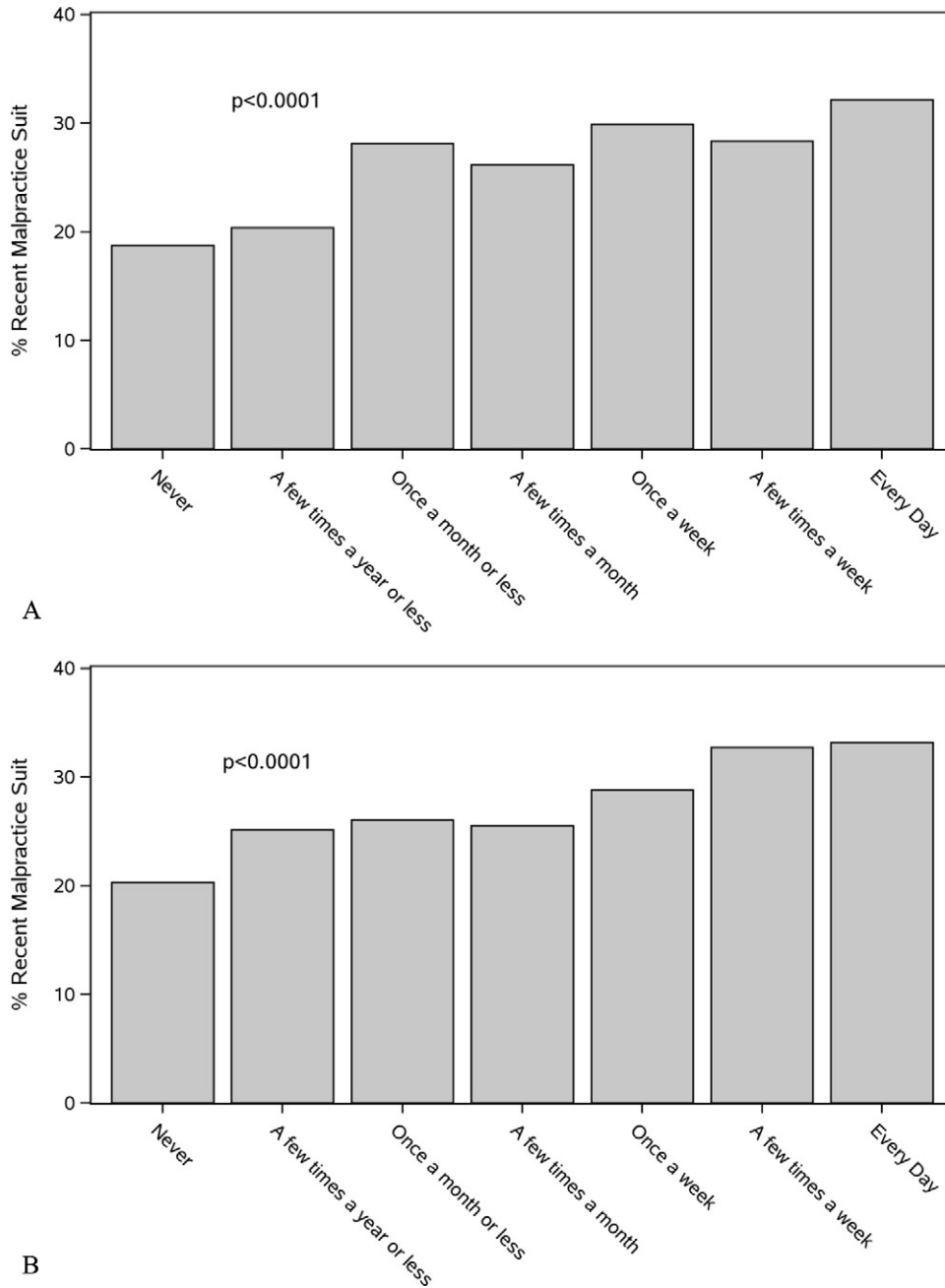


Figure 1. (A) Emotional exhaustion and malpractice suits. X axis indicates the frequency of emotional exhaustion symptoms. Y axis indicates the proportion of individuals who had experienced a malpractice suit in the last 24 months. (B) Depersonalization and malpractice suits. X axis indicates the frequency of depersonalization symptoms. Y axis indicates the proportion of individuals who had experienced a malpractice suit in the last 24 months.

suit in the last 2 years in the current study appears consistent with the published literature. In addition, our sample size provides malpractice rate estimates within 1.2% of the population rate with 95% confidence. Even if we had obtained a response from the vast majority of surgeons, the

accuracy would only have been within 0.63%. Although this error rate is based on the assumption that data are missing at random, even if a systematic bias existed such that those surgeons who did not respond to our survey had an approximate 37% rate of malpractice suit (eg, approxi-

Table 4. Factors Independently Associated with Having Experienced a Medical Malpractice Suit in the Last 2 Years

Characteristic and associated factors*	Odds ratio [†] (95% CI)	p Value
Positive depression screen	1.273 (1.117–1.451)	0.0003
Burnout	1.168 (1.015–1.345)	0.0306
Hours worked per week (each additional hour/wk)	1.006 (1.002–1.009)	0.0019
Nights on call per week (each additional night/wk)	1.039 (1.009–1.069)	0.0106
Specialty [‡]		
Breast surgeon	0.389 (0.267–0.567)	<0.0001
Ophthalmologic surgeon	0.365 (0.219–0.606)	<0.0001
Other surgeon	0.727 (0.559–0.945)	0.0171
Otolaryngology surgeon	0.368 (0.267–0.508)	<0.0001
Plastic surgeon	0.583 (0.437–0.777)	0.0002
Transplantation surgeon	0.465 (0.277–0.779)	0.0036
Urologic surgeon	0.691 (0.511–0.933)	0.0158
Vascular surgeon	0.713 (0.556–0.915)	0.0079
Practice setting [§]		
Active military practice	0.343 (0.176–0.669)	0.0017
Other practice	0.813 (0.665–0.995)	0.0049
Veterans practice	0.408 (0.249–0.668)	0.0004

*Factors included in the model: age, sex, relationship, age, sex, relationship status, children, specialty, children, specialty, size community, years in practice, hours worked, number of nights on call, practice setting, burnout (high Emotional Exhaustion and/or Depersonalization), positive depression screen, and suicidal ideation last 12 months.

[†]Odds ratio (OR) <1 indicate lower risk of a recent malpractice suit; OR>1 indicate higher risk of a recent malpractice suit. OR >1 indicate increased risk among those with a malpractice suit; OR<1 indicate lower likelihood among those with a recent malpractice suit.

[‡]As compared with general surgeons.

[§]As compared with private practice.

mately 50% higher than the rate of respondents), it would only cause the absolute malpractice suit estimate for the population to increase by 8.8%. Given our large sample size, our estimate of the rate of recent malpractice suits is therefore likely to have relatively small bias, even under a scenario of major nonresponse bias. It is also unknown whether surgeons who experience symptoms of depression or burnout are more apathetic and less likely to complete surveys or more likely to participate due to greater interest in the topic of job-related stress. The prevalence of symptoms of depression and burnout among the surgeons in this study are in line with the extensive published literature on physician burnout, including surgeons.^{1,3,9,33,52}

CONCLUSIONS

Malpractice litigation is common, has potentially profound personal consequences for US surgeons, and is related to surgeon burnout and suicidal ideation. Additional research is needed to identify individual, organizational, and societal interventions to support surgeons subjected to malpractice litigation.

Author Contributions

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REFERENCES

- Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. *Ann Surg* 2009; 250:463–471.
- Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg* 2009;144: 371–376.
- Balch CM, Shanafelt TD, Sloan JA, et al. Distress and career satisfaction among 14 surgical specialties, comparing academic and private practice setting. *Ann Surg*; in press. 2011.
- Balch CM, Shanafelt TS. Dynamic tension between success in a surgical career and personal wellness: how can we succeed in a stressful environment and a “culture of bravado”? *Ann Surg Oncol* 2011;18:1213–1216.
- Balch CM, Shanafelt TD, Sloan J, et al. Burnout and career satisfaction among surgical oncologists compared with other surgical specialties. *Ann Surg Oncol* 2011;18:16–25.
- Balch CM, Shanafelt TD, Dyrbye L, et al. Surgeon distress as calibrated by hours worked and nights on call. *J Am Coll Surg* 2010;211:609–613.

7. Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg* 2010;251:995–1000.
8. Shanafelt TD, Balch CM, Dyrbye L, et al. Special report: suicidal ideation among American surgeons. *Arch Surg* 2011;146:54–62.
9. Center C, Davis M, Detre T, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA* 2003;289:3161–3166.
10. Alexander BH, Checkoway H, Nagahama SI, et al. Cause-specific mortality risks of anesthesiologists. *Anesthesiology* 2000;93:922–930.
11. Campbell DA Jr. Physician wellness and patient safety. *Ann Surg* 2010;251:1001–1002.
12. Dyrbye LN, Shanafelt TD, Balch CM, et al. Relationship between work-home conflicts and burnout among American surgeons: a comparison by sex. *Arch Surg* 2011;146:211–217.
13. Kane CK, ed. Policy research perspectives: medical liability claim frequency: a 2007–2008 snapshot of physicians. 2010. Available at: <http://www.ama-assn.org/resources/doc/health-policy/prp-201001-claim-freq.pdf>. Accessed July 27, 2010.
14. Guest RS, Baser R, Li Y, et al. Cancer surgeons' distress and well-being, II: modifiable factors and the potential for organizational interventions. *Ann Surg Oncol* 2011;18:1236–1242.
15. Ware J, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996;34:220–233.
16. Ware J Jr, Kosinski M, Turner-Bowler D, et al, eds. How to score version 2 of the SF-12 Health Survey. Lincoln, RI: Quality Metric Incorporated; 2002.
17. Spitzer RL, Williams JB, Kroenke K, et al. Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA* 1994;272:1749–1756.
18. Whooley MA, Avins AL, Miranda J, et al. Case-finding instruments for depression. Two questions are as good as many. *J Gen Intern Med* 1997;12:439–445.
19. Maslach C, Jackson S, Leiter M. Maslach Burnout Inventory manual. 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
20. Rafferty JP, Lemkau JP, Purdy RR, Rudisill JR. Validity of the Maslach Burnout Inventory for family practice physicians. *J Clin Psychol* 1986;42:488–492.
21. Lee RT, Ashforth BE. A meta-analytic examination of the correlates of the three dimensions of job burnout. *J Appl Psychol* 1996;81:123–133.
22. Landrigan CP, Fahrenkopf AM, Lewin D, et al. Effects of the accreditation council for graduate medical education duty hour limits on sleep, work hours, and safety. *Pediatrics* 2008;122:250–258.
23. Thomas NK. Resident burnout. *JAMA* 2004;292:2880–2889.
24. West CP, Dyrbye LN, Sloan JA, Shanafelt TD. Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. *J Gen Intern Med*. 2009;24:1318–1321.
25. Gudex C, Dolan P, Kind P, Williams A. Health state valuations from the general public using the visual analogue scale. *Qual Life Res* 1996;5:521–531.
26. Spitzer WO, Dobson AJ, Hall J, et al. Measuring the quality of life of cancer patients: a concise QL-index for use by physicians. *J Chronic Dis* 1981;34:585–597.
27. Shanafelt TD, Novotny P, Johnson ME, et al. The well-being and personal wellness promotion strategies of medical oncologists in the North Central Cancer Treatment Group. *Oncology*. 2005;68:23–32.
28. West CP, Tan AD, Habermann TM, et al. Association of resident fatigue and distress with perceived medical errors. *JAMA* 2009;302:1294–1300.
29. Cella D, Zagari MJ, Vandoros C, et al. Epoetin alfa treatment results in clinically significant improvements in quality of life in anemic cancer patients when referenced to the general population. *J Clin Oncol* 2003;21:366–373.
30. Meehan PJ, Lamb JA, Saltzman LE, O'Carroll PW. Attempted suicide among young adults: progress toward a meaningful estimate of prevalence. *Am J Psychiatry* 1992;149:41–44.
31. Dyrbye LN, Thomas MR, Massie FS, et al. Burnout and suicidal ideation among US medical students. *Ann Intern Med* 2008;149:334–341.
32. Crosby AE, Cheltenham MP, Sacks JJ. Incidence of suicidal ideation and behavior in the United States, 1994. *Suicide Life Threat Behav* 1999;29:131–140.
33. Kuerer HM, Eberlein TJ, Pollock RE, et al. Career satisfaction, practice patterns and burnout among surgical oncologists: report on the quality of life of members of the Society of Surgical Oncology. *Ann Surg Oncol* 2007;14:3043–3053.
34. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med* 2002;136:358–367.
35. Frank E, McMurray JE, Linzer M, Elon L. Career satisfaction of US women physicians: results from the Women Physicians' Health Study. Society of General Internal Medicine Career Satisfaction Study Group. *Arch Intern Med* 1999;159:1417–1426.
36. Lemkau J, Rafferty J, Gordon R Jr. Burnout and career-choice regret among family practice physicians in early practice. *Fam Pract Res J* 1994;14:213–222.
37. Goitein L, Shanafelt TD, Wipf JE, et al. The effects of work-hour limitations on resident well-being, patient care, and education in an internal medicine residency program. *Arch Intern Med*. 2005;165:2601–2606.
38. Sloan JA. Assessing the minimally clinically significant difference: scientific considerations, challenges and solutions. *COPD* 2005;2:57–62.
39. Sloan JA, Cella D, Hays RD. Clinical significance of patient-reported questionnaire data: another step toward consensus. *J Clin Epidemiol* 2005;58:1217–1219.
40. Deshpande SP, Deshpande SS. Career satisfaction of surgical specialties. *Ann Surg* 2011;253:1011–1016.
41. West CP, Huschka MM, Novotny PJ, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA* 2006;296:1071–1078.
42. Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. *Soc Sci Med* 1997;44:1017–1022.
43. Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg* 2009;144:371–376.
44. Mello MM, Chandra A, Gawande AA, Studdert DM. National costs of the medical liability system. *Health Aff (Millwood)* 2010;29:1569–1577.
45. Guardado JR. Professional liability insurance indemnity and expenses, claim adjudication, and policy limits, 2000–2009. Pol-

- icy Research Perspectives No. 2010-2 Web site. Available at: <http://www.ama-assn.org/resources/doc/health-care-costs/medical-liability-reform.pdf>. Accessed March 22, 2011.
46. Localio AR, Lawthers AG, Brennan TA, et al. Relation between malpractice claims and adverse events due to negligence. Results of the Harvard Medical Practice Study III. *N Engl J Med* 1991;325:245–251.
 47. Klagholz J, Strunk AL. Overview of the 2009 ACOG Survey on Professional Liability. Available at: <http://www.acog.org/departments/professionalLiability/2009PLSurveyNational.pdf>. Accessed August 26, 2009.
 48. Studdert DM, Mello MM, Gawande AA, et al. Claims, errors, and compensation payments in medical malpractice litigation. *N Engl J Med* 2006;354:2024–2033.
 49. Studdert DM, Mello MM, Sage WM, et al. Defensive medicine among high-risk specialist physicians in a volatile malpractice environment. *JAMA* 2005;293:2609–2617.
 50. US Department of Health and Human Services. Addressing the new health care crisis: reforming the medical litigation system to improve the quality of health care. March 2003. Available at: <http://aspe.hhs.gov/daltcp/reports/medliab.pdf>. Accessed January 24, 2008.
 51. Congressional Budget Office. Medical malpractice tort limits and health care spending: background paper. Washington, DC: US Congressional Budget Office; April 2006.
 52. Guest R, Baser R, Li Y, et al. Cancer surgeons' distress and well-being, I: the tension between a culture of productivity and the need for self-care. *Ann Surg Oncol* 2011;18:1229–1235.