Malpractice Claims Against Family Physicians
Are the Best Doctors Sued More?

John W. Ely, MD, MSPH; Jeffrey D. Dawson, ScD; Paul R. Young, MD; Bradley N. Doebbeling, MD, MSc; Christopher J. Goerdt, MD, MPH; Nancy C. Elder, MD, MSPH; and Robert S. Olick, JD, PhD
Iowa City, Iowa; Lexington, Kentucky; and Portland, Oregon

BACKGROUND. Physicians who have been sued multiple times for malpractice are assumed to be less competent than those who have never been sued. However, there is a lack of data to support this assumption. Competence includes both knowledge and performance, and there are theoretical reasons to suspect that the most knowledgeable physicians may be sued the most.

METHODS. We conducted a retrospective cohort study of family physicians who were included in the Florida section of the 1996 American Medical Association's Physician Masterfile and who practiced in Florida at any time between 1971 and 1994 (N = 3686). The main outcome was the number of malpractice claims per physician adjusted for time in practice. Using regression methods, we analyzed associations between malpractice claims and measures of physician knowledge.

RESULTS. Risk factors for malpractice claims included graduation from a medical school in the United States or Canada (incidence rate ratio [IRR] 1.8; 95% confidence interval [CI], 1.6 - 2.1), specialty board certification (IRR 1.8; 95% CI, 1.6 - 2.1), holding the American Medical Association Physician's Recognition Award (IRR 1.4; 95% CI, 1.2 - 1.7), and Alpha Omega Alpha Honor Society membership (IRR 1.8; 95% CI, 1.1 - 3.0). Among board-certified family physicians, sued physicians who made no payments to a plaintiff had higher certification examination scores than nonsued physicians (53.48 vs 51.38, $P < .01$). The scores of sued physicians who made payments were similar to those of nonsued physicians (51.05 vs 51.38, $P = .93$).

CONCLUSIONS. Among Florida family physicians, the frequency of malpractice claims increased with evidence of greater medical knowledge.

KEY WORDS. Malpractice; medical errors; physicians, family; clinical competence; knowledge. *(J Fam Pract 1999; 48:23-30)*

It is commonly assumed that a physician's malpractice experience can be used as a measure of clinical competence.[1-4] This assumption has been endorsed by consumer advocates,[5,6] government agencies,[4,7,8] and physician organizations.[9] For example, the American Medical Association has proposed a uniform credentialing system with a set of requirements and standards.[9] One of these standards stipulates that the physician should have "minimal or no experience with malpractice litigation."[9] Similarly, the National Practitioner Data Bank was established in 1990 to identify incompetent physicians using information about their malpractice payments and other adverse actions.[7]

Previous studies have cast doubt on the assumed inverse relationship between malpractice claims and competence.[10-14] For example, among 30,195 hospital patients, Localio et al[11] found 280 adverse events caused by negligence and 47 malpractice suits. But only 8 of these 280 adverse events led to a malpractice suit, and 39 of the 47 suits were not associated with negligence. Thus, physicians who were negligent were unlikely to be sued, and physicians who were sued were unlikely to have been negligent.

Physicians with poor interpersonal skills are more likely to be sued.[13,15] In a study of Florida obstetricians, patients of frequently sued obstetricians complained about the human aspects of their care, such as a perceived lack of respect or concern.[13] An expert panel, blinded to the identity of these obstetricians, reviewed the medical records of their patients with adverse perinatal outcomes.[12] Among the 42 records from physi-

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This work was previously presented at the Society of Teachers of Family Medicine Annual Spring Conference in Chicago, Illinois, on April 23, 1998. *From the Department of Family Medicine (J.W.E., R.S.O.), the Department of Preventive Medicine and Environmental Health (J.D.D., B.N.D.), the Department of Internal Medicine (B.N.D., C.J.G.), and the Program in Biomedical Ethics and Medical Humanities (R.S.O.), University of Iowa College of Medicine, Iowa City; Iowa City Veterans Affairs Medical Center (B.N.D.); American Board of Family Practice, Lexington, Kentucky (P.R.Y.); and the Department of Family and Community Medicine, Oregon Health Sciences University, Portland (N.C.E.). Requests for reprints should be addressed to John W. Ely, MD, MSPH, University of Iowa Hospitals and Clinics, Department of Family Medicine, 200 Hawkins Drive, 01291-D PFP, Iowa City, Iowa 52242.*

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cians with no malpractice claims, the panel found 8 relevant errors in care. Among the 17 records from frequently sued physicians, the panel found no errors. Although this difference was not statistically significant, we were intrigued by the possibility that frequently sued physicians might practice better medicine than never-sued physicians.

At least 2 explanations could account for this improbable association. First, there may be an inverse relationship between medical knowledge and interpersonal skills. In a study of medical students, academic test results were negatively correlated with empathy scores on the California Psychological Inventory.[16] In addition, female physicians have better interpersonal skills[17-21] and are sued less often than male physicians,[22,23] but they tend to score lower on some written tests of medical knowledge.[21,24,25] Other investigators, however, have found no consistent relationship between interpersonal skills and academic performance.[26-29]

Second, more competent physicians might have more suits if they care for sicker or more litigious patients.[23] For example, board-certified family physicians are more likely than non–board-certified physicians to have hospital privileges and to care for patients in critical care units.[30,31] (oral communication, G. Tolleson, American Academy of Family Physicians, November 1997)

The purpose of our study was to assess the relationship between proxy measures of medical knowledge and the incidence of malpractice claims among family physicians. Although clinical competence includes both knowledge and performance,[32] we collected data reflecting only the knowledge component. However, medical knowledge correlates with more comprehensive measures of clinical competence.[33-37] We hypothesized that the most knowledgeable physicians would be sued most often. The importance of testing this hypothesis lies in the widely held belief that an adverse malpractice experience can be used as a marker of decreased medical competence.[4,5,7-9]

METHODS

SAMPLE

The study included 2 samples of family physicians. In the first sample, all Florida family physicians who were listed in the 1996 edition of the American Medical Association (AMA) *Directory of Physicians in the United States*[38] were eligible (N = 5138). This directory includes all physicians regardless of AMA membership or practice setting. For each physician, it lists the medical school, year of medical school graduation, year of medical licensure, specialty board certification, AMA Physician's Recognition Award status, and self-reported specialty. The Physician's Recognition Award requires a minimum of 50 hours of continuing medical education per year.[39] In some analyses, we used the year of medical school graduation as a surrogate for physician age because it was more consistently available. We excluded 1088 physicians who had never held a Florida medical license or who were licensed after 1994. These recently licensed physicians were excluded because, in this study, the median time between injury occurrence and filing a malpractice claim was 3.2 years, and our claims database was current through April 30, 1997. We excluded 356 physicians who described their main practice activity as administration, education, research, or "other nonpatient care." Finally, we excluded 8 military physicians because we did not have access to military claims data. We included all other Florida family physicians if they reported family practice or general practice as their primary specialty and if they practiced in Florida at any time between 1971 and 1994 (n = 3686).

The same exclusion criteria were applied to the second sample, which comprised all board-certified Florida family physicians listed in the 1997 American Board of Family Practice (ABFP) Directory (N = 2124; after exclusions, final sample n = 1406). This sample was used to determine whether certification examination scores were associated with malpractice claims frequency.

The 2 study samples overlapped: 1361 physicians were in both the AMA and the ABFP directories; 2325 physicians were in the AMA directory but not the ABFP directory; 45 physicians were in the ABFP directory but not the AMA directory.

DATA SOURCES

Since 1974, the Florida Department of Insurance has maintained a database of all closed medical malpractice claims, regardless of outcome. Companies that insure Florida physicians are required to report any malpractice claim that results in "(1) a final judgment in any amount, (2) a settlement in any amount, or (3) a final disposition not resulting in payment on behalf of the insured."[40] Individual claims information from this source was added to the AMA data. We determined whether each physician was listed in *The Best Doctors in America: Southeast Region*.[41] This layperson's guide was compiled using subjective peer assessments and a standard question: "If you had a close friend or loved one who needed a [family physician] . . . to whom would you refer them?" To determine the quality of United States (US) medical schools, we used the *Gourman Report*, a ranking based on admission requirements, qualifications of faculty, physical plant, and other criteria.[42] Mean Medical College Admission Test (MCAT) scores and grade point averages (GPA) of entering classes were obtained for US medical schools from various sources.[43-45] Information about family practice residencies was obtained from the American Academy of Family Physicians *Directory of Family Practice Residency Programs*[46] and the *Directory of Board Certified Medical Specialists*.[47] Alpha Omega Alpha (AOA) Honor Society membership was obtained from the most recent AOA directory.[48]

Among board-certified family physicians, we analyzed associations between original certification examination scores and subsequent malpractice experience. The certification examination includes 530 written questions with standardized scores based on a mean of 50 and a range of 20 to 80. The scores are multiplied by 10 before they are reported (eg, 53.5 is reported as 535). This analysis was performed at the American Board of Family Practice in Lexington, Kentucky.

The databases used in this study did not include unique identifiers such as social security numbers. Thus, the physician's name was used as the primary linking variable. A match on first name, last name, middle initial, and suffix (Jr, Sr, III, and so forth) was considered valid. To differentiate duplicate names, we used additional information such as address, medical school, year of medical school graduation, and year of Florida medical license.

The study protocol and procedures to protect confidentiality were approved by the University of Iowa Institutional Review Board and the Board of Directors of the American Board of Family Practice.

Analysis

The primary outcome variable was the malpractice claims incidence rate, which was defined as the total number of claims divided by the total number of years in practice for each physician. For example, a physician with 2 claims after 10 years in practice would contribute 2 claims to the numerator and 10 person-years to the denominator. A secondary outcome was monetary payment to the plaintiff, regardless of amount.

The Florida database contained malpractice claims reported between 1974 and 1997. We studied physicians who practiced in Florida for 1 or more years between 1971 and 1994 because the median lag between the injury date and the reporting date to the Florida Department of Insurance was 3.2 years (range = 0.3 to 10.1 years). For currently practicing physicians, the number of practice years was determined by subtracting the year of Florida licensure from 1994. For retired physicians, the number of practice years was determined by subtracting the year of Florida licensure from the year the physician reached age 65 (arbitrarily assumed age of retirement).

Variables potentially associated with malpractice claims included physician gender (male), graduation from a US or Canadian medical school, medical school quality,[42] medical degree (Doctor of Medicine [MD] vs Doctor of Osteopathy [DO]), family practice residency completion, American Board of Family Practice certification, listing in the *Best Doctors in America: Southeast Region* directory,[41] AMA Physician's Recognition Award, practice location, Alpha Omega Alpha Honor Society membership, and board certification examination score.

When considering residency completion, we limited the analysis to physicians who graduated from medical school in 1970 or later (n = 1745) because the first family practice residencies had been developed by that time. We excluded from this analysis 186 physicians who completed residencies in specialties other than family practice and 97 physicians for whom residency information was unavailable. When considering the quality of medical schools, we limited the analysis to US graduates (n = 1877), because the *Gourman Report* does not include medical schools outside the United States.[42] When considering Alpha Omega Alpha Honor Society membership, we limited the analysis to physicians who were licensed in Florida in 1988 or before (n = 3157) because the most recent AOA directory was published in 1988.

Theoretically, data measured in counts, such as malpractice claims, might follow a Poisson distribution, in which the variance is approximately equal to the mean. However, malpractice data are often "over-dispersed"[3] (the variance is greater than the mean), and that was true in this study. Therefore, we used a variation of Poisson regression, known as negative binomial regression, which accommodates this over-dispersion.[49-51] Independent associations were assessed by entering all variables of interest into a multiple negative binomial regression. The effects of these variables were reported as incidence rate ratios which are analogous to relative risks.

To assess whether the associations represented incremental effects or threshold effects, physicians with at least 10 years of practice were grouped according to claims frequency: (1) no claims, (2) 1 or 2 claims, and (3) 3 or more claims. These cut points were selected because we speculated that there would be little difference in risk factors between the first 2 groups, whereas those with 3 or more claims, suggesting a more consistent pattern, might have distinguishing risk factors. In a separate analysis, physicians with 10 or more years in practice were grouped according to payment to the plaintiff: (1) no claims, (2) 1 or more claims with no payment for any claim, and (3) 1 or more claims with payment. Odds ratios with confidence intervals were used to analyze these associations. Finally, we used one-way analysis of variance to define the association between board-certification examination scores and malpractice-payment categories. A two-tailed significance level of .05 was chosen, and all analyses were performed using Stata software (Stata Corporation, College Station, Tex).

RESULTS

Characteristics of the study physicians are summarized in Table 1. Their mean age (54.6 years) was relatively old because we excluded physicians who were licensed after 1994 (n=195), and we included retired physicians (n = 386), if they had practiced in Florida during any period between 1971 and 1994. Among board-certified family physicians, the mean certification examination score was 51.20 (standard deviation=6.65). Almost one

TABLE 1

Characteristics of Florida Family Physicians in Study Sample (n = 3686)

Characteristic	Mean (SD)
Age (years) in 1997	54.6 (13.4)
Years of practice in Florida during study period	14.9 (7.3)
	No. (%)
Male gender	3143 (85.3)
Graduated from US or Canadian medical school	2036 (55.2)
MD (vs DO) degree	3625 (98.4)
Completed family practice residency*	1196 (68.5)
Family Practice Board certification	1766 (47.9)
Held AMA Physician's Recognition Award†	370 (10.0)
Listed in *Best Doctors in America*[41]	68 (1.8)
Member of Alpha Omega Alpha Honor Society‡	42 (1.3)
Nonurban practice location§	655 (17.8)

SD denotes standard deviation; AMA, American Medical Association.
*Proportion (68.5%) based on physicians who graduated from medical school after 1969 (n=1745).
†An award granted by the American Medical Association requiring at least 50 hours of continuing medical education per year.
‡Proportion (1.3%) includes only physicians licensed in Florida before 1989, the year of most recent Alpha Omega Alpha membership directory (n=3157).
§Those not living in an urbanized area as defined by US Census Bureau (population greater than 50,000).

third (n=1126, 31%) of the 3686 physicians had been sued at least once during the study period, and more than half (n=623, 55%) of the sued physicians made 1 or more payments to a plaintiff.

Physician characteristics associated with malpractice claims included physician gender (male), graduation from a US or Canadian medical school, Family Practice Board certification, the AMA Physician's Recognition Award, nonurban practice location, and membership in the Alpha Omega Alpha Honor Society (Table 2). There was a trend for residency-trained physicians to be sued more often. Characteristics not associated with claims included the quality of the medical school attended,[42] the medical degree (MD or DO), listing in *Best Doctors in America: Southeast Region*,[41] additional measures of medical school quality (average MCAT scores and GPA of entering class), and 2 residency characteristics (faculty-resident ratio and affiliation with a medical school).

The risk factors for malpractice claims were not independent of each other. For example, board-certified physicians were more likely than non-board-certified physicians to have graduated from a US or Canadian medical school. Therefore, we used a multivariate analysis to identify independent associations between claims frequency and 5 of the risk factors that were significant in the univariate analyses. All 5 risk factors remained significant in the multivariate model: male gender (incidence rate ratio [IRR] 1.7; 95% confidence interval [CI], 1.4 - 2.1), graduation from a US or Canadian medical school (IRR 1.5; 95% CI, 1.3 - 1.7), Family Practice Board certification (IRR 1.6; 95% CI, 1.4 - 1.8), AMA Physician's Recognition Award (IRR 1.4; 95% CI, 1.2 - 1.7) and nonurban practice location (IRR 1.3; 95% CI, 1.1 - 1.5). Residency completion and membership in the Alpha Omega Alpha Honor Society were not included in this model because these analyses involved relatively small subgroups of the original sample.

For physicians with 10 or more years in practice, the risk of being sued at least once was 56% among those in a single high-risk group (board-certified male physicians graduating from US or Canadian medical schools) whereas the risk was only 17% among their low-risk counterparts (non–board-certified female physicians graduating from medical schools outside the United States).

Although many physicians have had 1 or 2 malpractice suits during their careers, a common assumption is that malpractice data can be used to identify incompetent physicians by focusing on those with many suits[4] or those who have made payments to plaintiffs.[7] However, in this study, physicians with 3 or more claims were most likely to have characteristics associated with greater knowledge, followed by physicians with 1 or 2 claims, and last, physicians with no claims (Table 3). When physicians were grouped according to payments, there appeared to be a plateau in which physicians with claims were more likely to have the knowledge characteristic, regardless of payment to the plaintiff (Table 4).

After grouping physicians into 4 decades of practice, the oldest group (those practicing more than 30 years after medical school completion) had a lower claims frequency than the other 3 groups (2.4 claims per 100 physicians per year vs 4.2 claims per 100 physicians per year, $P < .05$). There were no significant differences among the younger 3 groups of physicians. The frequency of claims peaked in the early 1980s and then fell until 1990, when it started to rise again. When year of medical school graduation and year of Florida licensure were included in the regression models, they did not meaningfully alter the other associations we found.

Among board-certified physicians, there was no association between the certification examination scores and the subsequent frequency of malpractice claims. Our

TABLE 2

Physician Characteristics Associated with Malpractice Claims Adjusted for Years in Practice

Characteristic	IRR	95% CI	P
Male	1.8	1.5 - 2.2	<.001
Graduated from US or Canadian medical school	1.8	1.6 - 2.1	<.001
Quality of medical school attended*	1.1	0.9 - 1.3	.46
MD (vs DO) degree	0.7	0.4 - 1.1	.14
Completed family practice residency†	1.3	1.0 - 1.7	.06
Family Practice Board certification	1.8	1.6 - 2.1	<.001
Held AMA Physician's Recognition Award‡	1.4	1.2 - 1.7	<.001
Listed in *Best Doctors in America*[41]	0.9	0.6 - 1.4	.61
Member of Alpha Omega Alpha Honor Society§	1.8	1.1 - 3.0	.02
Nonurban practice location‖	1.4	1.2 - 1.6	<.001

Note: Each row of the table reports a simple negative binomial regression controlling for number of years in practice.
IRR denotes incidence rate ratio (analogous to relative risk); CI, confidence interval; AMA, American Medical Association.
*A continuous quality ranking (range = 3.0 to 5.0) based on the *Gourman Report*.[42] Analysis limited to US medical school graduates (n=1877).
†Analysis based on physicians who graduated from medical school after 1969 (n = 1745).
‡An award granted by the American Medical Association requiring at least 50 hours of continuing medical education per year.
§Includes only physicians licensed in Florida before 1989, the year of the most recent Alpha Omega Alpha membership directory (n=3157).
‖Those not living in an urbanized area as defined by US Census Bureau (population greater than 50,000).

sample size was sufficient to determine a mean score difference of 1 point with 75% power and a mean difference of 2 points with 99% power. Sued physicians who made no payments to a plaintiff had higher mean scores than nonsued physicians and higher scores than sued physicians who made payments (Table 5).

TABLE 3

Family Physician Characteristics Associated with Malpractice Claims, Categorized by Number of Claims

Characteristic	1 or 2 Claims OR (95% CI)	≥ 3 Claims OR (95% CI)
Male	1.7 (1.3 - 2.3)	3.1 (1.7 - 5.6)
Graduate of US or Canadian medical school	2.0 (1.7 - 2.4)	4.1 (3.0 - 5.6)
Family Practice Board certification	2.5 (2.1 - 3.0)	3.8 (2.8 - 5.0)
Held AMA Physician's Recognition Award*	1.3 (1.0 - 1.7)	1.9 (1.3 - 2.7)
Nonurban practice location†	1.3 (1.0 - 1.6)	1.7 (1.3 - 2.4)

Note: Analysis limited to physicians with 10 or more years in practice (n = 2687).
OR denotes odds ratio (comparison group had no claims); CI, confidence interval.
*An award granted by the American Medical Association requiring at least 50 hours of continuing medical education per year
†Those not living in an urbanized area as defined by US Census Bureau (population more than 50,000).

DISCUSSION

In this study, physician characteristics that predicted malpractice claims included male gender, graduation from a US or Canadian medical school, Family Practice Board certification, the AMA Physician's Recognition Award, membership in the Alpha Omega Alpha Honor Society, and nonurban practice location. In other studies, characteristics found to be associated with greater medical knowledge include board certification,[52] graduation from a US or Canadian medical school,[53] and male gender.[21,24,25] Foreign medical graduates tend to score lower than US and Canadian graduates on the United States Medical Licensing Examination[53] and on specialty board examinations.[54] Language barriers, however, may explain part of this difference.[55] The association between malpractice claims and the Physician's Recognition Award should be interpreted cautiously because the award status of each physician was determined from the 1996 AMA directory, whereas the malpractice claims occurred up to 25 years before 1996. Thus, the temporal relationship between the Award and the claim is opposite to the other relationships we studied and could represent a consequence of the claim rather than a determinant.

Our findings are consistent with other studies in which male gender[22,23] and board certification[23] were risk factors for malpractice claims. Other investigators have found no association between malpractice claims and medical degree (MD vs DO)[22] or medical school quality.[23] The secular trends found in this study and the relative infrequency of claims among older physicians are consistent with previous studies.[4,22] Our findings contrast with other investigators who found no association between malpractice claims and foreign medical graduate status[22,56,57] or board certification.[22] We found no association

TABLE 4

Family Physician Characteristics Associated with Malpractice Claims, Categorized by Payment to Plaintiff

Characteristic	≥ 1 Claim; 0 with Payment OR (95% CI)	≥ 1 Claim; At Least 1 with Payment OR (95% CI)
Male	2.1 (1.5 - 3.1)	2.0 (1.4 - 2.8)
Graduate of US or Canadian medical school	2.7 (2.2 - 3.4)	2.1 (1.7 - 2.5)
Family Practice Board certification	2.7 (2.2 - 3.4)	2.5 (2.1 - 3.0)
Held AMA Physician's Recognition Award*	1.5 (1.1 - 2.0)	1.4 (1.1 - 1.9)
Nonurban practice location†	1.4 (1.1 - 1.8)	1.3 (1.0 - 1.6)

Note: Analysis limited to physicians with 10 or more years in practice (n = 2687).
OR denotes odds ratio (comparison group had no claims); CI, confidence interval.
*An award granted by the American Medical Association requiring at least 50 hours of continuing medical education per year.
†Those not living in an urbanized area as defined by US Census Bureau (population more than 50,000).

between claims frequency and listing in *The Best Doctors in America: Southeast Region.*[41] However, in a study of cardiovascular surgeons, the selection of physicians in this "best doctors" guide did not correlate with more objective measures of competence.[58] The higher claims rates among nonurban physicians in this study contrasts with other data[59] and may be partially explained by the tendency for rural physicians to see more patients than urban physicians.[60] Poor patients are less likely to sue,[61] and, in our study, physicians trained outside the United States were more likely to practice in urban areas. However, Florida's poverty levels are similar between urban and rural areas.[62,63]

More knowledgeable physicians might have been sued more often if they cared for sicker or more litigious patients.[23] In previous surveys, board-certified Florida family physicians were more likely than non–board-certified physicians to care for patients in intensive care units, to perform surgery, and to care for pediatric patients, but they were not more likely to provide obstetric care.[31,64](oral communication, G. Tolleson, American Academy of Family Physicians, November 1997) More knowledgeable physicians might have had higher patient volumes, which could help explain the associations we found.[65] However, we were unable to find data addressing an association between patient volume and physician knowledge.

Malpractice claims and payment rates in Florida are similar to mean rates for the United States as a whole.[7,66] However, the extent to which our findings can be applied to other states is unknown. Also, the findings of our study may not apply to other specialties because we surveyed only family physicians.

We did not measure several variables that are known to predict malpractice claims. For example, poor interpersonal skills are strong predictors of malpractice claims,[13,15] but these qualities are difficult to measure in large populations. Also, patient characteristics and independent judgments about negligence were not included in our analyses. We used the most recent physician directories available, but the study period extended from 1971 to 1994. Thus, some physicians may not have practiced in Florida for the entire time between their Florida licensure and their listing in the Florida section of the 1996 AMA Directory.[38]

We assessed only the knowledge component of physician competence, and most of our findings are based on only proxy measures of knowledge. These measures were generally determined at the start of the physician's career, rather than at the time of the malpractice claim. However, written tests of medical knowledge have been found to correlate with subsequent clinical competence and quality of care.[33-37] For example, in a study of family physicians, those with high-

TABLE 5

Association Between American Board of Family Practice Certification Examination Scores and Malpractice Payments (N=1387)

Payment Category	Exam Score, Mean	SD	No. of Physicians	Physician-Years
No claims	51.38	6.55	943	8408
≥ 1 Claim, 0 with payment	53.48	6.28	199	3290
≥ 1 Claim, at least 1 with payment	51.05	5.70	245	4042

Note: One-way ANOVA weighted by years in practice ($F = 14.50$, $P < .001$). In pair-wise comparisons using Bonferroni-adjusted P values (an adjustment for multiple comparisons), the mean score of the no-payment physicians (53.48) was higher than the mean score of both the no-claims physicians (51.38, $P < .01$) and the payment physicians (51.05, $P < .001$). The mean score difference between the no-claims physicians (51.38) and the payment physicians (51.05) was not significant ($P = .93$). The scores were unavailable for the 19 physicians who were certified in 1970 (first year the examination was offered).

er licensing examination scores were less likely to prescribe inappropriate medications and more likely to refer women aged 50 to 69 years for mammography.[37]

CONCLUSIONS

Our findings do not imply a cause-and-effect relationship between knowledge and malpractice. The associations we found may have been due to confounding factors that were not measured, such as patient complexity or physician interpersonal skills. It is possible that more knowledgeable physicians are more likely to be negligent, although this seems unlikely based on the findings of other studies.[33-37] Our study and others[10-12] challenge the assumption that an unfavorable malpractice experience indicates physician incompetence.

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