Characteristics Associated With Physician Discipline

A Case-Control Study

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Background: There has been increasing attention devoted to patient safety. However, the focus has been on system improvements rather than individual physician performance issues. The purpose of this study was to determine if there is an association between certain physician characteristics and the likelihood of medical board-imposed discipline.

Methods: Unmatched, case-control study of 890 physicians disciplined by the Medical Board of California between July 1, 1998, and June 30, 2001, compared with 2981 randomly selected, nondisciplined controls. Odds ratios (ORs) were calculated for physician discipline with respect to age, sex, board certification, international medical school education, and specialty.

Results: Male sex (OR, 2.76; P < .001), lack of board certification (OR, 2.22; P < .001), increasing age (OR, 1.64; P < .001), and international medical school education (OR, 1.36; P < .001) were associated with an elevated risk for disciplinary action that included license revocation, practice suspension, probation, and public reprimand. The following specialties had an increased risk for discipline compared with internal medicine: family practice (OR, 1.68; P = .002); general practice (OR, 1.97; P = .001); obstetrics and gynecology (OR, 2.25; P < .001); and psychiatry (OR, 1.87; P < .001). Physicians in pediatrics (OR, 0.62; P = .001) and radiology (OR, 0.36; P < .001) were less likely to receive discipline compared with those in internal medicine.

Conclusion: Certain physician characteristics and medical specialties are associated with an increased likelihood of discipline.

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PATIENT SAFETY HAS RECEIVED increased attention since the release of the 1999 Institute of Medicine report, To Err Is Human: Building a Safer Health System.1-3 While the report emphasized the need to develop better systems in medicine, it acknowledged that some small proportion of health care professionals “may be incompetent, impaired, uncaring, or may even have criminal intent” and thus are the appropriate subject of medical board discipline to protect patients from harm.4 In addition, prompt identification of such practitioners coupled with appropriate corrective action is an important component of a comprehensive patient safety program.5

Discipline is administrative sanction imposed by a medical board for violations of laws or regulations.6 Regarding the incidence of medical discipline among the 800 000 physicians licensed in the United States, approximately 4000 disciplinary actions were imposed by state medical boards in 2001.7 Of the approximately 110 000 physicians licensed by the Medical Board of California, the Board disciplines about 350 doctors per year.8

The prevalence of physicians with concerns that might lead to discipline is surprisingly high. For example, approximately 4% of California-licensed physicians have been disciplined by the Medical Board of California.9 Similarly, one international review reported a 5% prevalence of problem doctors (defined as physicians with recurrent problems in functioning) across several countries including the United States.10 Also, Donaldson11 reported that over a 5-year period approximately 6% of senior physicians in a region of England’s National Health Service had serious disciplinary problems. In addition, Schaffer et al12 found that during a 10-month period 5% of applications for clinical privileges in a national ambulatory care program contained falsified credentials. Finally, since approximately 40% of disciplinary actions by the Medical Board of California are imposed due to a finding of negligence,13 disciplined phy-
Physicians represent a significant threat to patient safety and a barrier to improving health care quality.

In spite of the importance of physician performance as a quality of care concern, there have been few studies examining the characteristics of disciplined physicians as a group. A MEDLINE search for the period January 1970 through March 2002 yielded no prospective studies and a single case-control study. To better understand potential risk factors for discipline, we undertook a case-control study of physicians disciplined by the Medical Board of California between July 1, 1998, and June 30, 2001. Using logistic regression modeling, we examined the association of age, sex, board certification, international medical education, and specialty with the risk of discipline.

METHODS

DESCRIPTIVE DATA AND SOURCES

The Medical Board of California receives and evaluates each of approximately 10000 complaints per year regarding physicians. Of these complaints, roughly 2000 require field investigation. Ultimately, around 350 physicians per year are disciplined by the Medical Board. We identified physicians disciplined by the Medical Board of California between July 1, 1998, and June 30, 2001. This was accomplished using the Consumer Affairs System, a computerized database within the California Department of Consumer Affairs. Discipline is an administrative sanction imposed by the Medical Board for violations of law or regulations. None of the physicians in the 3-year period of the study had more than one administrative action. However, a single administrative action can be imposed for multiple violations of law. We used the index violation recorded in the Consumer Affairs System by Medical Board analysts. According to Medical Board policy, the index violation is the one representing the highest risk to patients and the infraction that is associated with the most severe discipline. If there is more than one violation of comparable severity, the underlying violation (eg, mental illness, self-use of drugs/alcohol) is recorded as the index violation.

Discipline history of California physician licensees is public by law and is available on the Medical Board of California Web site (www.medbd.ca.gov) and through the Action Report (a quarterly Medical Board publication that is mailed to California-licensed physicians, hospitals, and other healthcare entities).

Information on medical school of graduation, years of postgraduate training, primary specialty, board certification, and birth date was obtained from the American Medical Association (AMA) e-Physician Profiles system that provides online access to the AMA Physician Masterfile. The e-Physician Profiles system is available on a subscription basis to organizations involved in physician credentialing. Data on medical school, postgraduate training, and board certification are verified by the AMA, while primary specialty and birth date are self-reported. Physician sex was obtained from the Consumer Affairs System.

Reported primary specialty was used to classify each physician into 1 of 27 specialty categories: allergy and immunology; anesthesiology; colon and rectal surgery; dermatology; emergency medicine; family practice; internal medicine; medical genetics; neurological surgery; neurology; nuclear medicine; obstetrics and gynecology; ophthalmology; orthopedic surgery; otolaryngology; pathology; pediatrics; physical medicine and rehabilitation; plastic surgery; preventive medicine; psychiatry; radiology; surgery; thoracic surgery; urology; general practice; and other specialty.

Because California law governing licensing of physicians does not distinguish between graduation from a Canadian medical school and a US medical school, we grouped graduates of Canadian and United States institutions into the category “domestic medical education” and graduates of all other medical schools into the category “international medical education.”

CASES AND CONTROLS

Cases targeted for the study were all California-licensed physicians who were disciplined from July 1, 1998, through June 30, 2001, of which there were 898. Eight physicians had incomplete data in the AMA Physician Masterfile, resulting in 890 cases being used for the study. Discipline included (1) license revocation, (2) practice suspension, (3) probation, (4) public reprimand, or (5) other disciplinary action imposed by the Division of Medical Quality, Medical Board of California. The age of disciplined physicians was based on the effective date of the enforcement action imposed by the Medical Board of California. To increase statistical power, all surgical specialties were pooled into a single “surgery” category. In addition, any remaining specialty category that represented less than 5% of the case group and less than 5% of the control group was placed in the “other specialty” category. This resulted in the following 10 specialty categories: anesthesiology, family practice, internal medicine, obstetrics and gynecology, pediatrics, psychiatry, radiology, surgery, general practice, and other specialty. A total of 3000 controls were randomly selected from the 97707 physicians who had an active (ie, permitted to treat patients) California medical license as of June 30, 2001, and who had not been disciplined by the Medical Board of California. The randomization procedure was accomplished using SAS statistical software (SAS Institute, Cary, NC) by first randomly sorting the 97707 physicians using a random number generating function and then using the “surveyselect” procedure to select a simple random sample of 3000 controls. After excluding 19 cases that had incomplete descriptive data, 2981 controls were available for the study. For controls, age was determined using the midpoint of the study period, January 1, 2000.

The research protocol was approved on July 5, 2001, by the Committee on Human Research at the University of California, San Francisco.

STATISTICAL ANALYSIS

Demographic and practice variables for cases and controls were analyzed using χ² and t test statistics for comparison of proportions and means, respectively.

Multivariable logistic regression analyses were conducted to determine the relationship of age, sex, board certification, international medical education, and specialty, to discipline. Internal medicine was selected as the reference group since it is the most common specialty among US physicians. It was also the most common specialty among cases and controls. A logistic regression analysis was performed that compared each specialty with internal medicine while taking into consideration the effects of age, sex, board certification, and international medical education. The odds ratio (OR) for age was calculated based on 20-year increases in age.

SAS version 8.0 was used for all analyses.

RESULTS

CASES AND CONTROLS

Descriptive characteristics of cases (disciplined physicians) and controls (nondisciplined physicians) are pre-
In univariate analysis, cases were more likely than controls to be male; not board certified; in the specialties of family practice, general practice, obstetrics and gynecology, or psychiatry; and an international medical school graduate.

**OFFENSES AND DISCIPLINE**

Table 2 shows the distribution of violations and discipline for the 890 cases. The most common violation was negligence (38%) followed by drug- or alcohol-related offenses (10%), unprofessional conduct (10%), conviction of a crime (9%), and inappropriate prescribing (9%) violations. The most common disciplinary actions were probation (34%), public reprimand (22%), license suspension (21%), or license revocation (16%).

**MULTIVARIABLE ANALYSIS**

Odds ratios, from the logistic regression model assessing risk of discipline, are displayed in Table 3. Relative to specialists in internal medicine, specialists in radiology and pediatrics were at significantly lower risk of discipline, while specialists in family practice, general practice, obstetrics and gynecology, and psychiatry were at significantly higher risk. The risk of discipline for physicians specializing in anesthesiology and surgery did not differ significantly from that for specialists in internal medicine. Increasing age in 20-year intervals and male sex were positively and independently associated with an increased likelihood of discipline. Board certification was associated with a significantly reduced risk of discipline. International medical education was

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**Table 1. Characteristics of Cases and Controls**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cases (n = 890)</th>
<th>Controls (n = 2981)</th>
<th>Total (N = 3871)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age,† y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>55.6 ± 11</td>
<td>49.8 ± 13</td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Range</td>
<td>29-90</td>
<td>25-92</td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>81 (9)</td>
<td>716 (24)</td>
<td>797</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>809 (91)</td>
<td>2265 (76)</td>
<td>3074</td>
<td></td>
</tr>
<tr>
<td>Board certification</td>
<td>473 (53)</td>
<td>2170 (73)</td>
<td>2643</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>43 (5)</td>
<td>182 (6)</td>
<td>225</td>
<td>.15</td>
</tr>
<tr>
<td>Family practice</td>
<td>109 (12)</td>
<td>275 (9)</td>
<td>384</td>
<td>.008</td>
</tr>
<tr>
<td>General practice</td>
<td>75 (8)</td>
<td>74 (2)</td>
<td>149</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>154 (17)</td>
<td>687 (23)</td>
<td>841</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Obstetrics/gynecology</td>
<td>86 (10)</td>
<td>170 (6)</td>
<td>256</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>26 (3)</td>
<td>248 (8)</td>
<td>274</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>108 (12)</td>
<td>228 (8)</td>
<td>336</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Radiology</td>
<td>13 (1)</td>
<td>166 (6)</td>
<td>179</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Surgery‡</td>
<td>156 (18)</td>
<td>423 (14)</td>
<td>579</td>
<td>.01</td>
</tr>
<tr>
<td>Other§</td>
<td>120 (13)</td>
<td>528 (18)</td>
<td>848</td>
<td>.003</td>
</tr>
<tr>
<td>International medical school graduate</td>
<td>238 (27)</td>
<td>604 (20)</td>
<td>842</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Values are number (percentage) unless otherwise indicated.
†Mean age of cases is age calculated to the date of the enforcement order. Mean age for controls is age calculated to the midpoint of the study period, January 1, 2000.
‡Includes all surgical specialties.
§Includes all specialties not specifically listed.

**Table 2. Number of Medical Practice Violations by Discipline Imposed**

<table>
<thead>
<tr>
<th>Violation</th>
<th>Revocation</th>
<th>Suspension Only</th>
<th>Probation With Suspension</th>
<th>Probation</th>
<th>Public Reprimand</th>
<th>Other Action</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligence</td>
<td>33</td>
<td>1</td>
<td>10</td>
<td>124</td>
<td>93</td>
<td>7</td>
<td>335 (38)</td>
</tr>
<tr>
<td>Inappropriate prescribing</td>
<td>11</td>
<td>0</td>
<td>7</td>
<td>18</td>
<td>24</td>
<td>0</td>
<td>78 (9)</td>
</tr>
<tr>
<td>Unlicensed activity</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>17 (2)</td>
</tr>
<tr>
<td>Sexual misconduct</td>
<td>14</td>
<td>0</td>
<td>3</td>
<td>23</td>
<td>3</td>
<td>0</td>
<td>68 (8)</td>
</tr>
<tr>
<td>Mental illness</td>
<td>17</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>3</td>
<td>51 (6)</td>
</tr>
<tr>
<td>Self-use of drugs/alcohol</td>
<td>20</td>
<td>0</td>
<td>1</td>
<td>36</td>
<td>1</td>
<td>0</td>
<td>87 (10)</td>
</tr>
<tr>
<td>Fraud</td>
<td>11</td>
<td>8</td>
<td>10</td>
<td>17</td>
<td>20</td>
<td>0</td>
<td>67 (8)</td>
</tr>
<tr>
<td>Conviction of a crime</td>
<td>19</td>
<td>13</td>
<td>9</td>
<td>32</td>
<td>7</td>
<td>0</td>
<td>81 (9)</td>
</tr>
<tr>
<td>Unprofessional conduct</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>21</td>
<td>43</td>
<td>0</td>
<td>88 (10)</td>
</tr>
<tr>
<td>Miscellaneous violations</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>18 (2)</td>
</tr>
<tr>
<td>Total (%)</td>
<td>142 (16)</td>
<td>190 (21)</td>
<td>44 (5)</td>
<td>301 (34)</td>
<td>199 (22)</td>
<td>18 (1)</td>
<td>890 (100)*</td>
</tr>
</tbody>
</table>

*Because of rounding, numbers do not add to exactly 100.
were underrepresented. In contrast, Morrison and

ogy, internal medicine, anesthesiology, and pediatrics

ties in the general physician population. General sur-

sicians compared with the proportions of these special-

practice were overrepresented among disciplined phy-

chiatry, obstetrics and gynecology, and family/general

ciplined for sex-related offenses, they found that psy-

specialty. In their national study of physicians dis-

ed that physician discipline was not distributed equally by

age was associated with a lower risk of discipline. These as-

with a significantly elevated risk of disci-

In our study, certain specialties, increasing age mea-

20-year increments, and male sex were associ-

with a higher risk of discipline. Board certification

age group while only 34.5% of all US physicians were in

that category.

Among the characteristics examined in our study, the

odds ratio was largest for male sex (OR, 2.76; P < .001).

Male sex has been associated with higher rates of phy-

sician discipline in other studies. Morrison and Wickers-

sham suggested that these differences might explain

finding that malpractice rates for men were 2 to 4 times

of women. Such differences might also ac-

for the elevated discipline risk seen for male phy-

icians in our study. These potential hypotheses, how-

should be formally tested by specific studies.

Board certification was associated with a lower risk of
discipline (OR, 0.45; P < .001) in our study and that
of 75 psychiatrists disciplined over a 30-month in-
terval, 8% were women; although nationally, 27% of all
psychiatrists were women. There are a number of pos-
deferences between male and female physicians in
practice styles and patient interaction including risk tol-
erance, aggressiveness, willingness of patients to file a
complaint, communication, and patient satisfaction. Tan-
gin et al22 suggested that these differences might explain
their finding that malpractice rates for men were 2 to 4
times that of women. Such differences might also ac-
count for the elevated discipline risk seen for male phy-

icians in our study. These potential hypotheses, how-

should be formally tested by specific studies.

Board certification was associated with a lower risk of
discipline (OR, 0.45; P < .001) in our study and that
of Morrison and Wickersham.13 Consistent with these
findings, Silber et al22 reported that board-certified an-
esthesiologists had better clinical outcomes, adjusted for
case mix, than their non-board-certified counterparts.
Their study used Medicare claims records for 144,883 pa-

patients in Pennsylvania. In addition, Slogoff et al23 re-
ported good correlation between the clinical skills rat-
ing of 1310 anesthesiology residents, assessed by their respective residency directors, and the subjects’ likeli-
hood of subsequently becoming board certified in anes-
esthesiology.

International medical graduates were significantly more likely to be disciplined than domestic graduates (OR, 1.36; P = .001). In contrast, Morrison and Wickersham13 found that international medical graduates were not more
likely than domestic graduates to be disciplined. Also, 2 other studies have failed to find significant differences in the quality of care delivered by domestic vs international medical graduates.24,25 These 3 studies, though, differed from ours in the variables selected for modeling and in the particular subset (e.g., attending physicians) of international medical graduates chosen for study.

Our study has a number of limitations. In focusing on discipline of California-licensed physicians, the associations identified may not apply to other regions of the United States because of variations in practice styles, patient populations, and legal frameworks. For example, data regarding physician discipline in New York (1985-1988) showed a higher percentage of cases involving misuse of drugs and alcohol and a lower percentage of cases related to negligence and incompetence compared with our findings.26 Although this study addressed physician discipline in one state, California licenses about 13% of physicians in the United States.18

It is not known whether these associations apply to substandard practitioners, in general, since disciplined physicians represent a subset of a poorly defined universe of physicians with significant practice deficiencies. Also, as with other case-control studies, control of various unknown, extraneous variables may not have been achieved.27 For example, social and cultural factors related to physician-patient interactions may influence perceptions of practice deficiencies. Because of the limited number of available variables in our secondary data set, we were unable to explore additional physician-related factors that may affect the likelihood of medical board-imposed sanctions.

Because this study was exploratory, causal relationships with discipline should not be inferred and, therefore, an individual physician’s risk of discipline cannot be ascertained by the logistic regression model developed from this study. For example, we cannot exclude bias based on characteristics such as age, sex, or lack of board certification as at least a partial explanation for the observed relationships with discipline. Such bias could occur in the complaint reporting, investigation, prosecution, or adjudication processes leading to physician discipline. However, given the legal checks and balances and due process protections under California law,14 we believe that it is unlikely that bias is the predominant explanation for our findings.

Our study, however, used 2½ times as many cases and 8 times as many controls as the Morrison and Wickersham study.13 This allowed an assessment of 9 specialty categories with respect to the risk of discipline. In addition, the multivariable, logistic regression model simultaneously evaluated the association of age, sex, board certification, international medical school education, and specialty, with discipline. These associations have not been explored previously in this manner.18 There are potential policy implications for our findings. Board certification is an important credential used by medical groups, hospitals, health maintenance organizations, academic medicine, and health care consumers as an indicator of professional achievement and clinical ability.28-30 Our results and those of Morrison and Wickersham13 support the use of board certification as one benchmark of clinical quality, whether as a direct measure of specialty-relevant knowledge and skills, or as a visible indicator for other characteristics associated with good medical practice. In addition, the association of increasing age with discipline supports efforts by the American Board of Medical Specialties,31 professional societies,32,33 and researchers34,35 to enhance the development and assessment of continuing competence, professionalism, and lifelong learning among physicians.31

Additional research is needed to identify the underlying causes for the association of discipline with certain specialties, male sex, increasing age, international medical education, and lack of board certification. In addition, further work is needed to determine the factors that lead to the various types of violations. For example, it would be interesting to examine whether physician recertification affects the likelihood of medical board-imposed discipline. With a better understanding of the “pathophysiology” of discipline, ultimately, a systematic approach to the early identification and remediation of physician deficiencies might be developed to enhance patient safety. A number of physician remediation programs, in fact, have been developed to address concerns such as drug and alcohol abuse36 and incompetence.37-40 However, because significant performance problems have been identified prior to practice, in residency41 and even medical school,12 such a systematic approach will need to examine the full span of a physician’s career from medical school admission through retirement from practice.

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