Orthopedic Board Certification and Physician Performance: An Analysis of Medical Malpractice, Hospital Disciplinary Action, and State Medical Board Disciplinary Action Rates

Mininder S. Kocher, MD, MPH, Laura Dichtel, BS, James R. Kasser, MD, Mark C. Gebhardt, MD, and Jeffrey N. Katz, MD, MS

Abstract

Specialty board certification status has become the de facto standard of competency by which the profession and the public recognize physician specialists. However, the relationship between orthopedic board certification and physician performance has not been established. Rates of medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions were compared between 1309 board-certified (BC) and 154 non–board-certified (NBC) orthopedic surgeons in 3 states. There was no significant difference between BC and NBC surgeons in medical malpractice claim proportions (BC, 19.1%; NBC, 16.9%; *P* = .586) or in hospital disciplinary action proportions (BC, 0.9%; NBC, 0.8%; *P* = 1.000). There was a significantly higher proportion of state medical board disciplinary action for NBC surgeons (BC, 7.6%; NBC, 13.0%; *P* = .028). An association between board certification status and physician performance is necessary to validate its status as the de facto standard of competency. In this study, BC surgeons had lower rates of state medical board disciplinary action.

Dr. Kocher is Associate Director, Division of Sports Medicine, Children's Hospital, and Associate Professor of Orthopaedic Surgery, Harvard Medical School, Boston, Massachusetts.
Ms. Dichtel is Research Associate, Clincal Effectiveness Research Center, Department of Orthopaedic Surgery, Children's Hospital, Boston, Massachusetts.
Dr. Kasser is Chief, Department of Orthopaedic Surgery, Children's Hospital, and John E. Hall Professor of Orthopaedic Surgery, Harvard Medical School, Boston, Massachusetts.
Dr. Gebhardt is Chairman, Department of Orthopaedic Surgery, Beth Israel Hospital, and Professor of Orthopaedic Surgery, Harvard Medical School, Boston, Massachusetts.
Dr. Katz is Associate Professor of Medicine, Harvard Medical School, and Associate Professor of Health Policy and Management, Harvard School of Public Health, Boston, Massachusetts.

Address correspondence to: Mininder S. Kocher, MD, MPH, Department of Orthopaedic Surgery, Children's Hospital, 300 Longwood Ave, Boston, MA 02115 (tel, 617-355-7497; fax, 617-739-3338; e-mail, mininder.kocher@tch.harvard.edu).

Am J Orthop. 2008;37(2):73-75.

Specialty board certification has become the de facto standard of competency by which the profession and the public recognize physician specialists. As of 2000, the 24 member boards of the American Board of Medical Specialties had certified approximately 89% of 955,129 licensed physicians in the United States. Currently, the board issues certificates in 36 general specialties and 88 subspecialties.[1] Most hospitals, managed care organizations, and health insurance plans require board certification of physicians seeking to obtain clinical privileges and join provider networks. The Joint Commission on Accreditation of Healthcare Organizations and the National Committee for Quality Assurance, the 2 largest organizations that accredit hospitals and other health provider organizations, incorporate board certification into their accreditation standards.[2,3]

Board certification is assumed to provide a measure of quality and competence, as the certification process usually mandates training, measures clinical knowledge, and assesses clinical practice. Nevertheless, results from studies that have examined the association between board certification and physician performance or outcomes have been mixed, with some studies finding an association and others finding none.[4-17]

The purported purpose of the American Board of Orthopaedic Surgery (ABOS) is "to serve the best interest of the public and the medical profession by establishing educational standards for orthopaedic residents and by evaluating the initial and continuing qualifications and competence of orthopaedic surgeons."[18] The orthopedic board certification process involves successful performance on a written examination assessing knowledge base (taken after satisfactory completion of an orthopedic surgery residency approved by the Accreditation Council for Graduate Medical Education) and an oral, case-based examination assessing clinical competence (taken after 2 years in practice). In addition, a recertification process exists to ensure ongoing clinical competency.

The purpose of this study was to assess the association between orthopedic board certification and physician performance by comparing rates of medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions between board-certified (BC) and non–board-certified (NBC) orthopedic surgeons. The null hypothesis was that there was no association between board certification and physician performance.

Methods

Rates of medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions were determined for orthopedic surgeons from Arizona, Massachusetts, and Virginia using public domain information provided by corresponding state medical boards. Status as an orthopedic surgeon was based on the physician's state medical license. Orthopedic surgeons in training or residing in other states were not considered.

Surgeons' data were recorded dichotomously—whether they had had a medical malpractice claim (or not), a hospital disciplinary action (or not), and a state board disciplinary action (or not) over the reporting period. Because of the limited and varied data provided by the state databases, further specifications were not made for medical malpractice claims (number of claims, number of years in practice, number of patients seen, severity of orthopedic condition, comorbidities, settlements vs trial awards, case mix), hospital disciplinary actions (number of actions, number of years in practice, number of patients seen, severity of orthopedic condition, comorbidities, reason for disciplinary action, type of disciplinary action), or state medical board disciplinary actions (number of actions, number of years in practice, number of patients seen, severity of orthopedic condition, comorbidities, reason for disciplinary action, type of disciplinary action).

Orthopedic board certification status was determined from public domain information provided by the ABOS. Surgeons were considered board-certified if they identified themselves as an orthopedic surgeon on their state medical license and they were identified as board-certified by the ABOS. Surgeons were considered non–board-certified if they identified themselves as an orthopedic surgeon on their state medical license and they were not identified as board-certified by the ABOS.

The Fisher exact test was used to compare the proportions of BC and NBC orthopedic surgeons who had had medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions. The study had sufficient power (β, <0.20, >80% power) to detect a 24% difference in state medical board disciplinary action rates. Statistical analysis was performed with SPSS (version 10.1; SPSS Inc, Chicago, Ill), SAS (version 6.12; SAS Institute, Cary, NC), and nQuery Advisor (version 4.0; Statistical Solutions, Saugus, Mass). All reported *P*s are 2-tailed with an α level of 0.05 indicating statistical significance. Institutional review board approval was obtained before this study was conducted.

Results

We studied 1463 orthopedic surgeons from 3 states (336 from Arizona, 564 from Massachusetts, 563 from Virginia). There were 1309 BC surgeons (89.5%) and 154 NBC surgeons (10.5%). There were 276 (18.9%) with medical malpractice claims and 1187 (81.1%) without these claims; 10 (0.7%) with hospital disciplinary actions, 1117 (76.3%) without these actions, and 336 (23.0%) with no data reported; and 119 (8.1%) with state medical board disciplinary actions and 1344 (91.9%) without these actions.

There was no significant difference between BC and NBC surgeons in medical malpractice claim proportions (BC, 19.1%; NBC, 16.9%; $P = .586$) or in hospital disciplinary action proportions (BC, 0.9%; NBC, 0.8%; $P = 1.000$). There was a significantly higher proportion of state medical board disciplinary action for NBC orthopedic surgeons (BC, 7.6%; NBC, 13.0%; $P = .028$).

Discussion

Specialty board certification has become the de facto standard of competency by which the profession and the public recognize physician specialists. The public uses board certification as a measure of a physician's expertise and competence. Despite disclaimers that board certification is but one of several qualifications to be considered in assessing the quality of a physician's clinical care, the ABOS and other general and subspecialty boards publish patient-oriented brochures to be distributed in the offices of BC practitioners.[1] The profession uses board certification as a standard for clinical competence. ABOS certification is requisite for fellowship in the American Academy of Orthopaedic Surgeons. Hospitals, federal agencies, health maintenance organizations, and health insurers also use board certification as a standard for clinical expertise. Many hospitals will not offer privileges to NBC physicians. Many insurers will not contract services with NBC physicians. In response to the increasing importance of board certification, an increasing number of physicians have become board-certified. Currently, almost 90% of US physicians are board-certified.[1]

Board certification is reasonably assumed to provide a measure of quality and competence, as the certification process usually mandates requisite training, measures clinical knowledge, and assesses clinical practice. However, the relationship between board certification and physician performance or outcomes has been indistinct. In a quantitative synthesis of 13 papers that fulfilled inclusion/exclusion criteria, Sharp and colleagues[4] found that, of 33 separable relevant findings, 16 demonstrated a significant positive association between certification status and positive clinical outcomes, 3 revealed worse outcomes for BC physicians, and 14 showed no association. The discrepant findings may be the result of use of different endpoints of physician performance in these studies.

Some studies have found an association between board certification and improved physician performance. Findings have included lower mortality after peptic ulcer surgery,[6] lower mortality after myocardial infarction,[7] lower mortality and fewer complications after carotid endarterectomy,[8] more preventive-care office measures,[9] more preventive-care pro-

cedures,[13] lower glycosylated hemoglobin levels for patients with diabetes,[9] higher clinical skills as rated by professional peers,[9] lower rates of low birth weight,[11] and lower rates of insurance coverage termination[14] for BC physicians.

Other studies have found no association between board certification and physician performance. Findings have included no differences between BC and NBC physicians for pain or function after total knee arthroplasty,[5] mortality after stomach cancer surgery,[6] mortality after abdominal aneurysm surgery,[6] mortality during cardiac catheterization,[7] mortality or complications after lower extremity bypass-grafting,[8] blood pressure control in patients with hypertension,[9] and mortality or complications after carotid endarterectomy.[10]

In the present study, we compared BC and NBC orthopedic surgeons' rates of medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions. We found no differences between BC and NBC surgeons in medical malpractice claim or hospital disciplinary action proportions, but we did find a lower proportion of state medical board disciplinary actions for BC surgeons.

Limitations of this study include its relatively small percentage of NBC surgeons (10.5%), which limited our ability to detect differences in physician performance in comparison with BC surgeons. In addition, the rate of hospital disciplinary actions was very low, which limited our ability to detect smaller but perhaps clinically important differences. The quality of the public domain data that we studied was also limited. For hospital disciplinary actions and state medical board disciplinary actions, further defining information was not available. For medical malpractice claims, further specification by number of claims, settlements versus trial awards, case mix, and number of years in practice was not possible. Furthermore, data were analyzed at the physician level, without adjustment for patient volume. Physicians who treat a high volume of patients over more years of practice would be more exposed to medical malpractice claims and hospital and state disciplinary actions.

In the literature on board certification and physician performance, a large variety of outcomes, endpoints, and behavior has been measured. In the present study, we measured rates of medical malpractice claims, hospital disciplinary actions, and state medical board disciplinary actions. The rationale for measuring hospital and state medical board disciplinary action rates was that physicians with poor competence would be more likely to engage in behavior that results in disciplinary actions. In a case–control study of licensure restriction data in California between 1995 and 1997, Morrison and Wickersham[15] found that physicians with disciplinary actions were less likely to be board-certified. The rationale for measuring medical malpractice claim rates was that physicians with poor competence may be more likely to be sued for medical malpractice. However, the relationship between medical malpractice rate and quality of care is unclear.[17] In a study of professional liability insurance claims filed in Florida between 1975 and 1988, Sloan and colleagues[17] found that BC anesthesiologists, obstetricians, and surgeons were *more* likely to have malpractice claims. Patient-derived outcome data were not analyzed in this study. Further study of the relationship between board certification and valid outcome measures is essential to establish clinically relevant validity of the board certification and recertification process. For example, lower complication rates, lower revision surgery rates, and higher generic and condition-specific outcome instrument scores for BC orthopedic surgeons would support use of board certification status as a proxy measure of quality of care.

Examination of the board certification process is essential to document its validity and to assure the public that certification is a marker of high-quality care. Despite lack of unequivocal evidence of the value of board certification, we do not advocate removing it as a measure of competence. Intuition, expert opinion, surrogate markers, and the findings reported here support the American Board of Medical Specialties position that board certification is one of several important considerations in evaluating a physician's knowledge, skill, and ability to provide good clinical care.[4] In addition to board certification status, many other factors affect clinical outcomes, including surgeon volume, hospital volume, type of clinical setting, size of support staff, and systems of care.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

References

1. American Board of Medical Specialties. *Annual Report and Reference Handbook*. Evanston, IL: American Board of Medical Specialties; 2000.
2. Joint Commission on Accreditation of Healthcare Organizations. *Joint Commission on Accreditation of Healthcare Organizations Handbook*. Oakbrook, IL: Joint Commission on Accreditation of Healthcare Organizations; 2003.
3. National Committee for Quality Assurance. *Health Plan Employer Data and Information Set*. Washington, DC: National Committee for Quality Assurance; 2003.
4. Sharp LK, Bashook PG, Lipsky MS, Horowitz SD, Miller SH. Specialty board certification and clinical outcomes: the missing link. *Acad Med*. 2002;77(6):534-542.
5. Heck DA, Robinson RL, Partridge CM, Lubitz RM, Freund DA. Patient outcomes after knee replacement. *Clin Orthop*. 1998;(356):93-110.
6. Kelly JV, Hellinger FJ. Physician and hospital factors associated with mortality of surgical patients. *Med Care*. 1986;24(9):785-800.
7. Kelly JV, Hellinger FJ. Heart disease and hospital deaths: an empirical study. *Health Serv Res*. 1987;22(3):369-395.
8. Pearce WH, Parker MA, Feinglass J, Ujiki M, Manheim LM. The importance of surgeon volume and training in outcomes for vascular surgical procedures. *J Vasc Surg*. 1999;29(5):768-776.
9. Ramsey PG, Carline JD, Inui TS, Larson EB, LoGerfo JP, Wenrich MD. Predictive validity of certification by the American Board of Internal Medicine. *Ann Intern Med*. 1989;110(9):719-726.
10. Brook RH, Park RE, Chassin MR, Kosecoff J, Keesey J, Solomon DH. Carotid endarterectomy for elderly patients: predicting complications. *Ann Intern Med*. 1990;113(10):747-753.
11. Haas JS, Orav EJ, Goldman L. The relationship between physicians' qualifications and experience and the adequacy of prenatal care and low birthweight. *Am J Public Health*. 1995;85(8 pt 1):1087-1091.
12. Tussing AD, Wojtowycz MA. The effect of physician characteristics on clinical behavior: cesarean section in New York state. *Soc Sci Med*. 1993;37(10):1251-1260.
13. Nelsen DA Jr, Hartley DA, Christianson J, Moscovice I, Chen MM. The use of new technologies by rural family physicians. *J Fam Pract*. 1994;38(5):479-485.
14. Adamson JE. Five-year history of the American Society of Plastic and Reconstructive Surgeons, 1969–1973. *Plast Reconstr Surg*. 1975;55(4):445-455.
15. Morrison J, Wickersham P. Physicians disciplined by a state medical board. *JAMA*. 1998;279(23):1889-1893.
16. Schwartz WB, Mendelson DN. Physicians who have lost their malpractice insurance. Their demographic characteristics and the surplus-lines companies that insure them. *JAMA*. 1989;262(10):1335-1341.
17. Sloan FA, Mergenhagen PM, Burfield WB, Bovbjerg RR, Hassan M. Medical malpractice experience of physicians. Predictable or haphazard? *JAMA*. 1989;262(23):3291-3297.
18. American Board of Orthopaedic Surgery. *President's Report*. Chapel Hill, NC: American Board of Orthopaedic Surgery; 2004.