

Chapter 10

Physician Specialization

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Physician Specialization

INTRODUCTION

The use of physician specialization to measure the quality of care provided by individual physicians represents a structural approach to measuring quality. Like other structural indicators, physician specialization is often used to assess quality on the assumption that certain characteristics of physicians may lead to better performance, which in turn may bring about better patient outcomes.

A person who wants to practice medicine and surgery legally in a State must obtain a license or certification of qualification from the State Board of Medical Examiners or other designated agency (70 Corpus Juris Sec. 12). Although the requirements for medical licensure vary among States, in general, a person must be a graduate of a medical school accredited by the Liaison Committee on Medical Education,¹ have completed 1 year of residency training in a program approved by the Accreditation Council for Graduate Medical Education,^{*} and have passed the Federation Licensing Examination sponsored by the Federation of State Medical Boards (470).³ With a medical license from a given State, a physician can practice medicine in that State, in whatever specialty area he or she chooses.

Some physicians, in addition to having general medical training, may have received training in

¹The Liaison Committee on Medical Education is the official accrediting body for educational programs leading to the M.D. degree and is listed for this purpose by the U.S. Secretary of Education and recognized by the Council of PostSecondary Accreditation. The committee consists primarily of members from the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges (157).

^{*}The Accreditation Council for Graduate Medical Education is composed primarily of members from the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Council of Medical Specialty Societies. Louisiana, Missouri, Ohio, and Tennessee do not require any residency training for licensure. Connecticut, Guam, Maine, New Hampshire, and Washington require completion of 2 years of residency training, and Nevada requires 3 years (470).

³Most States also recognize certifying examinations of the National Board of Medical Examiners to license physicians (513).

a particular specialty area. Such training is not required for medical licensure, but physicians who have specialty training may be eligible to become certified by a specialty board.⁴ Even if they have not received specialty training or been board-certified, however, physicians may designate themselves specialists.

Two major operational definitions of physician specialization have been used:

- certification by a specialty board, and
- the fact that a physician is practicing in his or her area of specialty training.

Many organizations certify physicians. The American Board of Medical Specialties and the American Medical Association (AMA) officially recognize the 23 specialty boards shown in table 10-1. These boards certify 63.5 percent of the physicians practicing in the United States (365). The Advisory Board for Osteopathic Specialists recognizes the 17 osteopathic specialty boards shown in table 10-2. All of the 40 specialty boards recognized either by the American Board of Medical Specialties or by the Advisory Board for Osteopathic Specialists require physicians to complete a specified amount of training and a certain set of requirements and to pass an examination. In addition to these boards, there exist at least 69 specialty boards not recognized by the American Board of Medical Specialties or the Advisory Board for Osteopathic Specialists (see table 10-3).

⁴Depending on the specialty, a physician may complete 1 to 5 years of additional training in a specialty area. The American Board of Orthopedic Surgery requires 5 years of additional specialty training for a physician to become board certified, while the American Board of Colon and Rectal Surgery requires only 1 year of additional training. The term "board eligible" is sometimes used to describe a physician who has completed the necessary training and other predetermined requirements to become board certified, but has not taken the formal examination offered by the board. Because of continuing confusion about the term board eligible, however, the American Board of Medical Specialties' policy has disavowed the use of the term. The American Board of Medical Specialties has declared that the term has been given "such diverse meanings by different agencies that it has lost its usefulness as an indicator of a physician's progress toward certification by a specialty board" (18).

Table IO-- Specialty Boards Recognized by the American Board of Medical Specialties

American Board Of:	General certification	Certificates in subspecialty areas	Date initial subspecialty offered
		Certificates of special qualifications	Certificates of added qualifications
Allergy and Immunology	Allergy and immunology	Diagnostic laboratory immunology Critical care medicine	1986
Anesthesiology	Anesthesiology		1986
Colon and Rectal Surgery	Colon and rectal surgery	Dermatopathology	1974
Dermatology	Dermatology	Dermatological immunology/ diagnostic and laboratory immunology	1985
Emergency Medicine	Emergency medicine		1987
Family Practice	Family practice		1941
Internal Medicine	Internal medicine	Cardiovascular disease Critical care medicine Diagnostic laboratory immunoLOGY Endocrinology and metabolism Gastroenterology	1987 1986 1972 1941 1988
Neurological Surgery	Neurological surgery	Hematology Infectious disease Medical Oncology Nephrology pulmonary disease Rheumatology	1972 1972 1973 1941 1972
Nuclear Medicine	Nuclear medicine	Cooperates with American Board of Radiology and American Board of Pathology in radioisotopic pathology and nuclear radiology	1972
Obstetrics and Gynecology	Obstetrics and gynecology	Gynecologic oncology Maternal and fetal medicine Reproductive endocrinology	1974 1974 1974
Ophthalmology	Ophthalmology		1973
(Orthopaedic Surgery	Orthopedic surgery	Blood banking	1950
Otolaryngology	Otolaryngology	Chemical pathology	1974
Pathology	Anatomic and clin. path. Anatomic pathology Clinical pathology	Dermatopathology Forensic pathology Hematology Immunopathology Medical microbiology Neuropathology Radioisotopic pathology Diagnostic laboratory immunology Pediatric cardiology Pediatric critical care medicine Pediatric endocrinology Pediatric hematology -oncology Pediatric nephrology Pediatric pulmonology Neonatal-perinatal medicine	1959 1952 1983 1949 1947 1974 1986 1961 1987 1978 1974 1974 1986 1975
Pediatrics	Pediatrics		
Physical Medicine and Rehabilitation	Physical medicine and rehabilitation		
Plastic Surgery	Plastic surgery		
Preventive Medicine	Aerospace medicine Occupational medicine Public health and general preventive medicine		
Psychiatry and Neurology	Psychiatry Neurology Neurology with special qualifications in child neurology	Child psychiatry	1959
Radiology	Radiology Diagnostic radiology Radiation Oncology	Nuclear radiology	1957
Surgery	Surgery	Pediatric surgery	1975
		General vascular surgery	1986 1982 1988
Thoracic Surgery	Thoracic surgery		
Urology	Urology		

SOURCE: *American Board of Medical Specialties, Annual Report and Reference Handbook* (Evanston, IL: 1987).

Table 10-2.—Specialty Boards Recognized by the Advisory Board for Osteopathic Specialists

American Osteopathic Board of:	Subspecialties
Anesthesiology	
Dermatology	
Emergency Medicine	
General Practice	
Internal Medicine ..	Allergy/immunology Cardiology Endocrinology Gastroenterology Hematology Hematology/oncology Infectious diseases Medical diseases of the chest Nephrology Oncology Rheumatology
Neurology and Psychiatry ..	Child psychiatry Child neurology
Nuclear Medicine	
Obstetrics and Gynecology ..	Gynecologic oncology Maternal and fetal medicine Reproductive endocrinology
Ophthalmology and Otorhinolaryngology,	Oro-facial plastic surgery Otorhinolaryngology and oro-facial plastic surgery
Orthopedic Surgery.	Hand surgery
Pathology	Laboratory medicine Anatomic pathology Anatomic pathology and laboratory medicine Forensic pathology Neonatology Pediatric allergy/immunology Pediatric cardiology Pediatric hematology/ oncology Pediatric infectious diseases Pediatric intensive care Pediatric nephrology
Pediatrics	Preventive medicine/ aerospace medicine Preventive medicine/ occupational-environ- mental medicine Preventive medicine/public health
Preventive Medicine	
Proctology	
Radiology ..	Diagnostic radiology Radiation oncology
Rehabilitation Medicine	
Surgery	Surgery (general) Neurological surgery Plastic and reconstructive surgery Thoracic cardiovascular surgery Urological surgery General vascular surgery

SOURCE: Advisory Board for Osteopathic Specialists, "Requirements for Certification: Advisory Board of Osteopathic Specialists and Boards of Certification," Chicago, IL, 1987

In addition to offering a general certification, several specialty boards offer certificates in subspecialty areas. Altogether, there are 49 subspecialty areas of the 23 specialty boards recognized by the American Board of Medical Specialties (see table 10-1). Qualifications in these subspecialty areas are recognized by certificates of special or added qualifications.^a Within the 17 specialty boards recognized by the Advisory Board for Osteopathic Specialists, there are 40 subspecialty areas (see table 10-2).

The 13 studies reviewed for this chapter pertain to board certification by the 23 specialty boards recognized by the American Board of Medical Specialties.^b This chapter evaluates whether certification by these boards or practicing in one's area of specialty training are valid indicators of the quality of a physician's performance. Although the literature and this chapter examine physician specialization among allopathic physicians [Doctors of Medicine (M. D.s)], the discussion and conclusions drawn here are generally applicable to both allopathic and osteopathic physicians [Doctors of Osteopathy (D. O.S.)].

The next two sections of this chapter evaluate the reliability and validity of physician specialization as a measure of the quality of care. The third section considers the feasibility of using physician specialization as a quality indicator. The final section of the chapter presents conclusions about physician specialization as an indicator of quality. That section also discusses methods to improve the reliability and validity of physician specialization as a quality indicator and considers alternatives to better assure consumers of the acceptability of a physician's quality of care.

^aAccording to the American Board of Medical Specialties, "It is not necessary for physicians in a recognized specialty to hold special certification in a subspecialty of that field in order to be considered qualified to include aspects of that subspecialty within a specialty practice. Such special certification is a recognition of exceptional expertise and experience and has not been created to justify a differential fee schedule or to confer other professional advantages over other diplomats not so certified" (18).

^bAdditional details on the studies reviewed can be found in OTA's technical working paper "Physician Specialization as an Indicator of Quality: An Evaluation of the Literature" (434).

Table 10-3.—Independent Boards That Certify Physicians*

The following boards are called "American Board of _____" unless otherwise designated, and each claims to certify physicians.

Abdominal Surgeons	Malpractice Physicians
Acupuncture Medicine	Maxillofacial Surgeons
Addictionology	Medical Accreditation (American Federation for)
Aesthetic Plastic Surgery	Medical Genetics
Alcoholism and Other Drug Dependencies	Medical Hypnosis
Algology (Chronic Pain)	Medical Laborato~ Immunology
Ambulatory Anesthesia	Medical Legal Analysis in Medicine & Surge~
Bariatric Medicine	Medical Legal &Workers Compensation Medicine & Surgery
Bloodless Surgery	Medical Legal Consultants
Chelation Therapy	Medical Microbiology
Chemical Dependence	Medical Preventics (Academy of)
Clinical Chemistry	Medical Psychotherapists
Clinical Ecology	Medical Toxicology
Clinical Nutrition	Microbiology (Medical Microbiology)
Clinical Pharmacology	Milita~ Medicine
Clinical Toxicology	Neurological Orthopedic Surgery
Cosmetic Plastic Surgery	Nutrition
Cosmetic Surgery	Otorhinolaryngology
Council of Non-Board-Certified Physicians	Plastic Esthetic Surgeons
Disability Evaluating Physicians	Prison Medicine
Electroencephalograph	Psychiatric Medicine
Electromyography and Electrodiagnosis	Psychiatry (American National Board of)
Epidemiology (College)	Psychoanalysis (American Examining Board in)
Facial Cosmetic Surgery	Psychological Medicine (International)
Facial Plastic Surgery	Quality Assurance and Utilization Review
Forensic Psychiatry	Radiology and Medical Imaging
Forensic Toxicology	Ringside Physicians and Surgeons
Head, Facial & Neck Pain & TMJ Orthopedics	Skin Specialists
Health Physics	Spinal Cord Injury
Homeotherapeutics	Toxicology
Insurance Medicine	Trauma Surgery
Interventional Radiology	Tropical Medicine
Laser Surgew	Ultrasound Technology
Law in Medicine	Urologic Allied Health Professionals
Legal Medicine	

*The b~ard~ listed below are not members of the American Board of Medical Specialties and are not recognized by the Advisow Board for Osteopathic Specialists.

SOURCE: American Board of Medical Specialties, "Self-Designated Boards," Evanston, IL, June 16, 1967.

RELIABILITY OF THE INDICATOR

Advances in medical science and technological changes are inherent in medical care. Unless a physician's knowledge and skills in a specialty area are periodically updated or assessed, physician specialization as represented by board certification or practicing in one's area of specialty training may bean unreliable measure of the quality of a physician's performance over time.

In the past 10 years, there has been an increasing trend towards recertification by specialty boards. The American Board of Medical Specialties encourages the periodic reassessment of physicians and has written guidelines on recertifica-

tion for the specialty boards to use (18). So far, 15of the 23 specialty boards recognized by the American Board of Medical Specialties have adopted or decided to adopt time-limited certification, and 1 board offers voluntary recertification (see table 1o-4). Among these boards, the intervals between evaluations range from 6 to 10 years.

Without a recertification process, there is no guarantee that physicians have maintained the same level of skills and knowledge they demonstrated for their initial certification. Thus, board certification of a physician who was certified 20

**Table 2.—Recertification by Specialty Boards Recognized by the American Board of Medical Specialties:
Current Status and Requirements**

Board of:	Date of approval of recertification	Written exam for recertification	License required	Continuing medical education required	Recertification interval	Date of initial exam	Date of next recertification examination	Time-limited certificate ^a
Allergy and Immunology	1977	Yes		Yes ^d	6-∞ ^e	1977	1987	1989-10 yrs.
Dermatology	1979				10 yrs.		Indefinite	1991-10 yrs.
Emergency Medicine	1969	Yes ^c	Yes	Yes	6 yrs.	1976	1990	1980-10 yrs.
Family Practice	1973	Yes	No	No	3 yrs.	1974	1987	1969-7 yrs.
Internal Medicine	1973						1987	1990 ^d
Neurology	1976						Indefinite	1992-10 yrs.
Obstetrics/Gynecology	1986						1989	1986-10 yrs.
Ophthalmology	1986						Indefinite	1992-10 yrs.
Orthopaedic Surgery	1980	Yes	Yes	Yes	10 yrs.	1983	1987	1986-10 yrs.
Otolaryngology	1986					7 yrs.	1995	Annually ^e
Pathology	1979	Yes ^f	Yes	Yes ^g	6-10 yrs.		Indefinite	No
Pediatrics	1977	Yes	Yes	No	6 yrs.	1980	1987	1988-7 yrs.
Phys. Med. and Rehabilitation							Indefinite	1993-10 yrs.
Plastic Surgery	1976	v es	Yes ^h	Yes	7-10 yrs.	1977	1992	1985-10 yrs.
Surgery	1978	v es	Yes ^b	Yes ^b	7-10 yrs.	1980	1987	1976-10 yrs.
Pediatric Surgery	1981	v es	Yes ^b	Yes ^b	7-10 yrs.	1982	1987	1075-10 yrs.
Thoracic Surgery	1979	v es	Yes ^g	Yes ^g	7-10 yrs.	1984	Annually	1976-10 yrs.
Urology	1980	v es	Yes	Yes ^g	10 yrs.	1987	1985-10 yrs.	

^aType or number of hours unspecified.

^bAlso requires satisfactory review of ambulatory (office) records as a prerequisite to the recertification examination.

^cNumber of years not decided.

^dAfter 1995.

^eRequired in one of three separate pathways.

^fRequirement for two of three separate pathways.
SOURCE: American Board of Medical Specialties, *Annual Report and Reference Handbook* (Evanston, IL: 1987).

years ago may not indicate the same level of competence as the same board certification of a physician who has been assessed more recently.⁷ This variability in the significance of board certification over time reduces the reliability of the use of board certification as an indicator of quality. Recertification requirements would increase the reliability of board certification as an indicator of quality by making its significance more constant over time.

Physicians who were certified before their respective boards initiated recertification policies have not been subject to recertification.

A major issue in implementing recertification procedures is whether medical specialty boards can truly measure physician competence. Much of the opposition to recertification arises not because of recertification's quality assessment mechanism, but rather because of doubts about whether current examination procedures are an accurate measure of clinical skills. The American Board of Medical Specialties maintains that "recertification will be focused on performance assessment instead of the broad cognitive examinations used for primary certification" (365).

VALIDITY OF THE INDICATOR

Is Physician Specialization a Reasonable Indicator of Quality?

Intuitively, certification by a board recognized by the American Board of Medical Specialties is a valid indicator of the quality of a physician's medical performance. Board certification indicates that a physician has met a specified set of requirements and has performed up to a certain level on a qualifying examination in the specialty area. It makes sense that physicians who have had a certain amount of training in a specialty area would perform better than physicians who have had less or no training in the field.

Examples of the current uses of board certification demonstrate a general acceptance of its use as an indicator of quality. Patient brochures and other articles prescribing how to choose among physicians (published by hospitals or consumer health information centers) encourage consumers to use board certification as a measure of quality. Although the Joint Commission on Accreditation of Healthcare Organizations' standards for hospitals do not require that board certification be used for granting hospital privileges to physicians, the standards do state that "specialty board certification is an excellent benchmark for the delineation of clinical privileges" (330).

The fact that a physician is practicing medicine in the area in which that physician has been trained is also intuitively valid as an indicator of quality. It makes sense that a specialist practic-

ing in the area in which he or she has been trained would provide better quality care than, say, a board-certified specialist who is not practicing in his or her area of specialization.

Does the Board Certification Process Accurately Reflect a Physician's Competence?

Many specialty boards limit their evaluations of a physician to evaluation of the physician's knowledge of the pertinent subject matter; they often do not evaluate a physician's interpersonal skills or skills used to technically apply their knowledge. Part of the reason for this situation may be that knowledge is fairly *easy* to test. By comparison, a physician's interpersonal skills are rather difficult to measure. Judgment and clinical skills are other qualities that are difficult to measure, yet are of utmost importance for determining the competence of a physician. The certification process of the American Board of Internal Medicine does include a form that asks several questions about the interpersonal skills a physician demonstrated during his or her period of residency (16). This form ("Evaluation Form for Clinical Competence") is sent to the program director of each physician's residency program.

At any rate, many of the aspects of a physician's practice mentioned in the last paragraph are only proxy measures of physician competence. Burg and Lloyd emphasize the importance of the

specialty boards' defining competence to ensure the comprehensiveness of their evaluation measures:

Definitions of competence within a medical specialty discipline serve the purpose of providing a first step toward the development of more valid procedures for the certification of specialists. This is because one form of validity, content validity, calls for a comprehensive delineation of the skills and abilities the board is attempting to measure. Ideally, measures of competence in a specialty should sample from the components of competence identified as important by members of that specialty (110).

To evaluate the competence of a physician with patients, it is important to use direct assessment methods. Evaluating a medical audit of pediatric performance, a study by the National Board of Medical Examiners demonstrated that for many common diagnoses, cognitive certifying exams do not test the same content area covered by direct audit assessments of clinical performance (612). Although several specialty boards utilize techniques in which a physician's practice is evaluated more directly by requiring information for specific cases treated, these methods have not been adopted by a majority of the boards.

Further complicating the issue of validity and board certification is that board-certified physicians' practices are not necessarily limited to the area in which they have been certified. In fact, statistics from the AMA's *Physician Characteristics and Distribution: 1986* demonstrate that 5 percent of board-certified physicians are not certified by the board corresponding to the primary area of their practice (35). This fact makes it impossible for board certification, which assesses a physician's knowledge and skills in one specialty area, to be an accurate reflection of all specialty areas in which a physician may practice. Physicians who are practicing in a specialty area in which they have not been board certified may not, outside of medical school or residency training, have had their skills assessed in that particular area.

Does Physician Specialization Accurately Predict a Physician% Quality?

A review of the 13 available studies on physician specialization and quality (see table 105) gives one little confidence that board certification accurately predicts which physicians will provide high-quality care and which will not (220,477, 481,604).

One explanation for board certification's low predictive power could be weaknesses in available studies. The studies may have too many methodological problems—small sample size, a biased physician sample (if it includes physicians' volunteering to participate), or no inclusion of patient-mix indices and severity-of-illness adjustments—to accurately assess the relationship between board certification and physician performance.

Other issues may affect the accuracy of board certification in predicting that physicians will provide high-quality care. If board certification were a mandatory process as opposed to a voluntary one, it would be more likely that non-board-certified physicians had failed the certification process and were substandard practitioners. Since board certification is voluntary, however, some physicians who are as well qualified as board-certified physicians may simply choose not to substantiate their training through certification. Of course, a percentage of non-board-certified physicians are physicians who have attempted and failed the certification process. Other non-board-certified physicians may not have met the board's mandated prerequisites to be eligible for certification. In the studies OTA reviewed, however, the percentage of unqualified non-board-certified physicians was not high enough to affect the performance results in favor of board-certified physicians.

Another possible explanation for board certification's not being predictive of a physician's performance in practice could be the imprecise evaluation procedures used by the specialty boards to certify physicians. All of the 23 boards recognized by the American Board of Medical Specialties use

Table 10.5.—Studies on Physician Specialization Reviewed by OTA

Study^a	Physicians included	Conditions/procedures studied	Level of aggregation	Performance measure	Adjustments for patient characteristics	Sample size	Results
Ramsey, et al 1986 (510)	General Internists	5 Conditions <ul style="list-style-type: none"> • Diabetes • Hypertension • Respiratory infection • Urinary tract infection • Ischemic heart disease 	By diagnosis	Performance on American Board of Internal Medicine Exam Process measures <ul style="list-style-type: none"> • Items relating to diagnosis • Treatment strategies • Monitoring strategies⁹ Outcome measures ^c <ul style="list-style-type: none"> • Level of blood pressure control over a period of time • Glucose control • Exercise tolerance • Adverse outcomes^d Patient satisfaction Evaluations by professional associates	No adjustments	185 Board-certified 75 Non-board-certified	<ul style="list-style-type: none"> • Board-certified physicians performed significantly better on certification exam • No significant differences were found between board-certified and non-board-certified physicians for process or outcome measures for any condition • No difference was found between mean patient satisfaction score for certified and non-board-certified physicians • Board-certified physicians received significantly higher ratings from professional associates in most categories
Kelly and Helhnger, 1986 (347)	Primary surgeons <ul style="list-style-type: none"> • Colon and rectal • Neurologic • Orthopedic • Thoracic • General 	4 Conditions <ul style="list-style-type: none"> • Stomach operation with cancer diagnosis • Stomach operation with ulcer diagnosis • Intestinal operation with cancer of the colon or rectum • Blood vessel surgery with abdominal aneurysm 	By surgical procedure	Postoperative mortality	Adjustments made for severity of illness, age, sex, and number of diagnoses	1 241 Total surgeons	Board-certified surgeons were found to be associated with lower patient mortality rates
Strauss, et al 1986 (604)	Pulmonary specialists General internists Family practitioners	Chronic obstructive pulmonary lung disease	By diagnosis	Outcome measures <ul style="list-style-type: none"> • Pulmonary function • Functional ability • Institutionalized days • Mortality 	Adjustments made for severity and patient characteristics	96 Total physicians	No significant differences were found between the groups of specialists for outcome measures
Goldberg and Dietrich, 1985 (257)	Family physicians General internists Medical subspecialists	General primary care visits	By specialty status	Continuity of care ^b	Adjustments made for patient age, sex, and years with primary physician	40 Total physicians	No significant differences were found in continuity of care provided by subspecialists and generalists. Subspecialists provided higher levels of continuity to patients with a diagnosis living within their areas of expertise, but only at high utilization levels

Table 10-5.—Studies on Physician Specialization Reviewed by OTA (Continued)

Study ^a	Physician specialties included	Procedures studied	Level of comparison	Performance	Adjustments for	Sample
Sanazaro and Worth, 1985 (552)	General internists	5 Hospital diagnoses 6 Office diagnoses ^b	By diagnosis	Physician evaluations by peer reviewers based on explicit criteria for substantiation of diagnosis, prescribing indicated drug regimen, and monitoring and maintaining expected patient response	No adjustments	49 Board-certified 17 Non-board-certified
Payne, et al., 1984 (481)	Internists General/family practitioners Gynecologists Pediatricians	Conditions ^k	By diagnostic category	PPI/Physician Performance Score ^l	No adjustments	1,135 Total physicians
Flood, et al., 1982 (220)	All specialties	15 Selected surgical procedures ^m	All surgical categories combined	Postoperative status; measured extent of morbidity occurring 7 days after surgery or death within 40 days	Adjustments made for patient's physical status, stage of disease, age, sex, and emergency status at the time of the surgical procedure	544 Total physicians
Rhee, et al., 1981 (516)	Specialties ⁿ	Common diagnoses	Compared across diagnostic categories	PPI/Physician Performance Score ^l	No adjustments	321 Specialists 133 General practitioners
Lohr, et al., 1980 (385)	Internists Pediatricians Gynecologists General surgeons General practitioners	Common respiratory diagnoses and infectious diseases	By board-certification/specialty status	Appropriate use of injectable drugs and diagnostic tests (using explicit process criteria)	No adjustments	358 Total physicians (small sample size within each specialty)
Garg, et al., 1979 (242)	Cardiologists Urologists Internists Family practitioner ^o	Conditions: • Congestive heart disease • Ischemic heart attack • Stroke • Acute urinary infection • Chronic urinary infection	By diagnosis and specialty category	PPI	No adjustments	Not available

Table 10-5.-Studies on Physician Specialization Reviewed by OTA (Continued)

Study ^a	Physician specialties included	Conditions/procedures studied	Level of aggregation	Performance measure	Adjustments for patient characteristics	Sample size	Results
Rhee, 1977 (515)	18 Specialties ^b	20 Diagnoses	Compared across diagnostic categories	PP1/Physician Performance Score ^c	No adjustments	321 Specialists 133 General practitioners	Board-certified/board-eligible physicians had higher performance scores than general practitioners or self-designated specialists.
Hulka, et al., 1976 (308)	Family/general practitioners Internists Pediatricians Obstetricians	4 Conditions. c Adult-onset diabetes mellitus • Congestive heart failure • Normal pregnant woman • Normal newborn during the first year of life	By diagnosis	Minimum explicit consensus criteria for management protocol	No adjustments	34 Family physicians 11 Internists 8 Pediatricians 8 Obstetricians	Pediatricians and obstetricians performed better for infancy and pregnancy. There were no differences among physicians in performance for diabetes mellitus or congestive heart failure.
Rhee, 1976 (514)	18 Specialties ^b	20 Diagnoses	Compared across diagnostic categories	PP1/Physician Performance Score ^c	No adjustments	321 Specialists 133 General practitioners	Physician specialists were not found to relate to quality of physician performance.

^aNu-&r~ i~ - refer to numbered entries in the list of references at the end of this report.

^bThis includes determination of underlying factors, determination of severity of the condition, and determination of comorbid conditions.

^cThis includes complexity of therapy and avoidance of potentially harmful therapy.

^dFrequency of followup office visits.

^eMedical record for chronic diseases.

^fHypertension, hypoglycemia, hypokalemia.

^gMedical subspecialties included rheumatology, cardiology, hematology/oncology, and gastroenterology.

^hDefined as the percentage of visits that patients received from their primary physicians.

ⁱThese diagnoses included chronic heart failure, acute myocardial infarction, chronic obstructive pulmonary diseases, diabetes mellitus, acute bacterial pneumonia.

^jThese diagnoses included hypertension, diabetes mellitus, chronic heart failure, angina pectoris, chronic obstructive pulmonary disease, osteoarthritis,

^kPhysical examination, periodic gynecological examination, periodic pediatric medical examination, therapeutic use of Chloramphenicol, kiflex, digitalis preparation, and prednisone, anemia,

essential hypertension, chronic heart disease (arteriosclerotic, hypertensive, rheumatic), vulvovaginitis, acute urinary tract infection, chronic or recurrent urinary tract infection,

^lThe physician performance index (ppi) is a process measure of performance developed by Payne and Lyons in 1974. Explicit process criteria for a variety of diagnoses and examinations were developed if

1974 by panels of practicing specialists. Physician performance was measured according to the level of physicians' compliance with these explicit criteria. The criteria were weighted by the physician panel so that a single PPI score for each diagnosis or examination was generated. A Physician Performance Score represents a physician's average PPI score over all of his or her treated cases.

^mThe surgical procedures included were gastric surgery for ulcer, selected surgery of the biliary tract, surgery of large bowel, appendectomy, splenectomy, abdominal hysterectomy, vaginal hysterectomy,

craniotomy, amputation of lower limb (ankle to hip), repair of fractured hip, arthroplasty of the hip, lumbar laminectomy (with and without fusion), pulmonary resection, prostatectomy, and selected surgery of abdominal aorta and/or iliac arteries.

ⁿA subspecialty dermatology, internal medicine, necrologic surgery, Obstetrics/gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, Plastic surgery, Preventive medicine, psychiatry and neurology, radiology, general surgery, thoracic surgery, urology, general practice.

SOURCE: Office of Technology Assessment, 1988.

written examinations with multiple-choice questions to evaluate physicians, and 16 of the boards require oral examinations. Nine of the boards require physicians to submit a case list for recertification.⁸ In the oral examination for recertification, these nine boards ask physicians about their management of several cases. The particular cases discussed during the examination are picked by the specialty board from the case list submitted by the physician. Four boards require information from the physician's medical records (e.g., patient history, physician findings, and treatment outcome) for a specified number of cases (365).⁹

The relationship of the written and oral examination used by the American Board of Medical Specialties boards to actual physician performance is ambiguous. As noted earlier, test questions are more likely to measure what a physician knows about a certain field than the physician's actual clinical performance. If tests do not include an assessment of a physician's clinical competence, they may not provide an accurate prediction of a physician's performance. Studies have frequently demonstrated large discrepancies between levels of knowledge and levels of clinical performance (552).

Unfortunately, the assessment of a physician's clinical performance is not as adaptable to the format of a written examination as is an assessment of a physician's knowledge. Direct performance assessment instruments may provide a more accurate reflection of a physician's clinical competence and may have more predictive validity than written examinations. Although the 1975 American Board of Medical Specialties guidelines suggested that practice audits and performance evaluations should be part of the certification process, only four member boards—the American Boards of Family Practice, Obstetrics and Gynecology, Surgery, and Thoracic Surgery—have so far

⁸A case list specifies the number of diagnoses/procedures treated by a physician. The nine boards requiring case lists for evaluation are the American Boards of Colon and Rectal Surgery, Neurological Surgery, Obstetrics and Gynecology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Surgery, Thoracic Surgery, and Urology.

⁹The four boards requiring information on cases treated are the American Boards of Obstetrics and Gynecology, Family Practice, Surgery, and Thoracic Surgery.

adopted such techniques. The American Board of Family Practice requires an office record review as part of its recertification process.¹⁰ Is board's particular methods of assessment increase the validity of its certification process, but they may give too much control to the physicians being evaluated?

¹⁰Every 6 to 7 years, physicians certified by the American Board of Family Practice are required to undergo an office record review as part of their recertification process. This process involves each physician's choosing two individual patient records for each of three different conditions. The three conditions are chosen by the physician from a list of 20 possible conditions decided upon by the Board of Family Practice. The board sends the physician an extensive questionnaire and scansheet, to be filled out for each condition. Questions pertain to patient history, physical exam, medications prescribed, and diagnostic procedures. After receiving the completed scansheet, the board analyzes and scores it by computer. The scores are based on the physician's compliance with explicit process criteria (determined by the board) for the diagnosis and treatment of specific conditions. If the scansheets reveal that the physicians are not handling their patients as the board's standards dictate, the Board of Family Practice gives physicians the opportunity to send in additional patient records until their scansheets are approved. The board randomly selects physicians to be spot checked by requiring them to send in a specific patient record and comparing this record to the physician's own scansheet on that same patient. According to the Board of Family Practice, conflicts between a physician's scansheet and the spot checked records rarely occur (490).



Photo credit: Intelligent Images

By taking physicians through multiple stages of clinical problem-solving, computer-based methods for assessing a physician's performance, such as the DxTer system shown above, may be more predictive of a physician's quality of care than written examinations.

ated. Physicians may be biased in their selection of records to send to the board for evaluation.¹¹

Other approaches to office practice evaluation entail onsite reviews of actual patient records. The College of Family Physicians of Canada, which combines the functions of a certifying board and a professional association, has developed a medical practice quality assessment model based on chart abstractions (see ch. 7 for a description). The college plans to apply these techniques for use within certification examinations for "practice-eligible" candidates and for use in practice accreditation (85).¹² Similar onsite office evaluations are being performed by the College of Physicians and Surgeons of Ontario, the medical licensing body of Ontario,¹³ and the park Nicollet Medical Center in Minneapolis, Minnesota.¹⁴

Computer-based testing is another example of a technique to assess physician performance. Computer-based assessment techniques that reproduce a physician's clinical practice can provide an interactive representation of patient/physician encounters.¹⁵ Although such techniques may be

¹¹If physicians choose only their best records, they will not be providing a representative sample of office records. Allowing a physician to send in records until the records are approved may also bias the sample.

¹²Practice accreditation, as opposed to certification, involves the random assessment of practicing physicians regardless of their specialty status.

¹³Each year since 1981, a total of 200 specialists and general Practitioners out of all Ontario's physicians have been randomly selected to undergo a mandatory office evaluation, entitled the Peer Assessment Program. These evaluations are fairly subjective and basic in scope and structure. They are performed mainly for finding physicians with significant deficiencies in their records or patient care. Certain physician groups assumed to be more at risk of providing poor quality care, such as physicians over the age of 70 or those in solo practice, are specially targeted for review (139). Quebec's licensing body is involved in similar office reviews of physicians who are reported as needing special attention (54).

¹⁴A Primary Care Practice Profile was developed to supply information to the MedCenters Health Plan about the quality of care provided by family practitioners in various settings. The Primary Care Practice Profile is used by an audit team of three nurses and one physician during an onsite visit and incorporates a diagnostic-specific chart to evaluate medical records in physicians' offices (417).

¹⁵The National Board of Medical Examiners has developed a Computer-Based Exam that provides electronic patient simulation (456). The computer presents X-rays and electrocardiograms for example, and allows the physician to order any test or procedure required. The Computer-Based Exam keeps track of the results in terms of time, costs, and patient outcome. One physician score is produced. This exam has had the most experience, but other such patient simulation devices also exist. A DxTer system developed by David Allen of Intelligent Images allows the viewer to see the image of a person

more predictive of a physician's quality of care than written examinations, their relative levels of accuracy remain to be validated through research.

The variations in the literature evaluating the relationship between board certification and quality of care reviewed for this OTA report are a reflection, in part, of the limited predictive power of various methods of assessing physician performance. The studies vary in regard to the performance measure used to assess a physician's quality of care. A physician's performance according to one technique may be different from his or her performance as measured by another method. In a study evaluating various procedures used to assess quality of care, Brook and Appel found the results of quality assessment to be determined by the method used (100). Between 1.4 and 63.2 percent of patients were determined to have received satisfactory care, depending on which method was used. Several studies reviewed for this report use the Physician Performance Index (PPI),¹⁶ a process measure of performance developed by Payne and Lyons (242,481,514,515, 516). Other studies use different process measures or various outcome measures of performance (220,257,347,385,510,552,604).

Although there are several inconsistent results, the literature suggests that specialists practicing in the area in which they have been trained provide a higher quality of care than specialists practicing outside their area of training. Restricting their scope of practice presumably enables these specialists to treat patients in defined areas ger-

brought into an emergency room or clinical office (364). Although expensive to produce, this system provides a very realistic simulation of clinical practice. Another uncued system developed by Harless of the National Library of Medicine allows the physician to speak to the patient on the screen and receive a response from the patient (364).

¹⁶Explicit process criteria for a variety of diagnoses and examinations were developed in 1974 by panels of practicing specialists. Panels developing criteria for infectious disease, heart disease, hypertension, gynecology, and pediatrics were made up of specialists practicing in the corresponding fields. Physician performance was measured according to the level of physicians' compliance with these explicit criteria. The criteria were weighted by the physician panel so that a single PPI score for each diagnosis or examination was generated. Several studies are one step removed from comparing physicians' PPI scores, and go further to derive a performance score for each physician. A Physician Performance Score is calculated by taking a mean of the standard scores for all the cases a physician has treated.

mance to their experience and training. One study evaluating performance differences between board-certified and non-board-certified physicians and between physicians practicing in their area of specialty training and physicians not practicing in their area of specialty training affirms the greater predictive power of physicians practicing in their area of training as an indicator of quality (481).

Methodological weaknesses in available studies evaluating physicians practicing in their area of specialty training may explain some of the variations in the results of the studies (242,515,604). In some studies, the inclusion of self-designated specialists in the category of physicians practicing in their area of specialty training may have confounded the performance scores of these specialists, seemingly limiting the predictive power of practicing in one's area of training as an indicator of the quality of care.

The use of physician specialization as an indicator of quality is more valid when its meaning is clarified by either of the operational definitions used in this chapter than when its meaning is left undefined. As noted earlier in this chapter, physicians may designate themselves specialists regardless of the amount of training they have had in the field or whether they are currently practicing in that specialty. There are no regulations or guidelines that limit who may call themselves specialists. Because specialists are reimbursed by Medicare at a higher rate than nonspecialists, there are financial incentives for physicians to label themselves specialists even if they have not received specialty training. Consequently, physician specialization (unless a physician's training and qualifications can be identified with certainty) allows for a wide range of interpretations and is not an accurate predictor of quality.

Is the Use of Physician Specialization as a Quality Indicator Generalizable Across Specialties?

Board certification by one specialty board says little about a physician's qualifications in another specialty area. Owing to the variation in methods of practice across medical fields and to the wide range of certification techniques utilized by

each of the 23 specialty boards that belong to the American Board of Medical Specialties,¹⁷ board certification can be defined only as it applies to a specific board. Since many available studies assess only one type of board-certified specialist, their results address only that particular specialty. One study, for example, assessed only the performance of physicians certified by the American Board of Surgery as compared to surgeons not certified by that board (347).

Along the same lines, a major limitation with a number of the studies OTA reviewed is that they evaluate board-certified physicians or specialists practicing in their area of training in the aggregate rather than by specialty category. Aggregating the scores of physicians certified by different specialty boards and practicing in different specialty areas may mask subtle differences among specialty categories. Furthermore, specialists from each of the specialty groups may not be equally represented in the sample. One study with these problems compared board-certified and board-eligible physicians to general practitioners and self-designated specialists. Performance scores for the physicians were aggregated by board certification or eligibility status and by self-designation or general practice instead of being interpreted separately by specialty category (515).

There is an inevitable trade-off in generalizability between studies that assess physician performance with respect to many diagnoses and studies that assess performance with respect to only one diagnosis. Internal medicine, a specialty studied by Sanazaro and Worth (552), is an especially broad specialty field and includes many categories of subspecialties. An evaluation of subspecialists of internal medicine with respect to their performance of a subspecialty procedure, may be a more accurate approach to measuring the quality of a specialist's performance in a particular specialty, but would not necessarily be generalizable to other subspecialties.

The generalizability of physician specialization also has limitations within an area of practice. A

¹⁷The boards may also differ in the required amount of time for education in a residency program and the specified stage for applying for certification—whether during or shortly after residency or after a specific amount of experience in the field.

physician's performance with respect to one diagnosis or procedure is not necessarily generalizable to other conditions and procedures. A certifying process that measures a physician's performance by assessing his or her skills for one or several diagnoses may not adequately serve as an indicator of the physician's performance overall (552). Thus, one cannot assume that a physician who performs poorly or well in the case of one or several diagnoses will perform poorly or well in all diagnoses.

In its broadest sense, certification by a board recognized by the American Board of Medical Specialties is an indication that a physician has met certain requirements and has passed certain

examinations to practice in a specialty area. Unless board certification as an indicator of quality is used in reference to a specific specialty area, the generalizability of board certification as an indicator is unclear.

If one defines a specialist as a physician who is practicing in the area in which he or she has been trained, the link between previous training and specialty practice is set up. Unlike the board-certification literature, available studies on the quality of physicians practicing in their area of specialty training generally do classify specialization at the level of the individual specialty (242,257,385,481,604).

FEASIBILITY OF USING THE INDICATOR

Information on physicians' board-certification status and specialty designation is already available to individuals and organizations and easily understood by the public. The *American Medical Directory*, provided by the AMA, contains information on the American Board of Medical Specialties board certification, on self-designated primary and secondary practice specialties (see table 10-6), and on dates of recertification for all U.S. physicians alphabetically and geographically by city and county. This 4-volume directory is published every 2 years and is available in public libraries. The *ABMS Compendium of Certified Medical Specialists* is a 7-volume publication that lists all of the specialists certified by the 23 boards that belong to the American Board of Medical Specialties. Although this compendium is also published biennially, The *ABMS Compendium Supplement* is published in between publication dates of the original volumes and brings the lists of certified specialists more up to date.

The *Directory of Medical Specialists*, published by Marquis Who's Who and available in most public, hospital, medical, and university libraries, also contains information on board certification. This publication may be incomplete, however, because some boards do not supply information about new board-certified specialists to this source.

Data on American Board of Medical Specialties board-certification status and self-designated practice specialties are also available from the AMA Physician Masterfile. This computer data base contains current and historical information on all physicians practicing in the United States and on those U.S. physicians temporarily practicing overseas. The data are provided to the Masterfile by primary sources.¹⁸ The AMA will provide a computerized printout containing background information on any U.S. physician to organizations such as hospitals, State licensing boards, medical schools, and medical societies for the purpose of credentials verification. Although information in the AMA Masterfile is primarily intended to assist organizations in verifying the credentials of physicians, the data are also available to individuals (672).

The general availability of information on board certification and specialty designation makes it apparent that confidentiality of this information is not an issue. Consumers may obtain information on board certification from county

¹⁸The American Board of Medical Specialties provides information on board certification, and the Federation of State Medical Boards (see ch. 6) provides information on final disciplinary actions by State boards that affect medical licensure.

Table 10-6.—Self-Designated Practice Specialties Recognized by the American Medical Association

Adolescent Medicine	Neonatal-Perinatal Medicine	Physical Medicine and Rehabilitation
Aerospace Medicine	Nephrology	Psychiatry
Allergy	Neurology	Psychiatry, Child
Allergy and Immunology	Neurology, Child	Psychoanalysis
Anesthesiology	Neuropathology	Public Health
Cardiovascular Diseases	Nuclear Medicine	Pulmonary Diseases
Critical Care Medicine	Nuclear Radiology	Radiation Oncology
Dermatology	Nutrition	Radiology
Dermatopathology	Obstetrics	Radiology, Diagnostic
Diabetes	Obstetrics and Gynecology	Radiology, Pediatric
Diagnostic Laboratory Immunology	Occupational Medicine	Reproductive Endocrinology
Emergency Medicine	Oncology	Rheumatology
Endocrinology	Ophthalmology	Surgery, Abdominal
Facial Plastic Surgery, Otolaryngology	Otolaryngology	Surgery, Cardiovascular
Family Practice	Pathology, Anatomic/Clinical	Surgery, Colon and Rectal
Gastroenterology	Pathology, Anatomic	Surgery, General
General Practice	Pathology, Blood Banking	Surgery, Hand
General Preventive Medicine	Pathology, Chemical	Surgery, Head and Neck
Geriatrics	Pathology, Clinical	Surgery, Neurological
Gynecological Oncology	Pathology, Forensic	Surgery, Orthopedic
Gynecology	Pathology, Radio Isotopic	Surgery, Pediatric
Hematology	Pediatrics	Surgery, Plastic
Immunology	Pediatric Allergy	Surgery, Thoracic
Immunopathology	Pediatric Cardiology	Surgery, Traumatic
Infectious Diseases	Pediatric Endocrinology	Surgery, Urological
Internal Medicine	Pediatric Hematology-Oncology	Surgery, Vascular
Legal Medicine	Pediatric Nephrology	
Maternal and Fetal Medicine	Pediatric Pulmonology	
Medical Microbiology	Pharmacology, Clinical	

SOURCE American Medical Association, Division of Survey and Data Resources. "Intended Use of AMA Physician Masterfile Codes for Self-Designation of Practice Specialty," Chicago, IL, January 1987

medical societies or from the American Board of Medical Specialties. Directly asking a physician or requesting the information from the hospital where the physician has staff privileges are further possibilities.

Determining whether physicians are practicing in the area of their training is not as easy for consumers as is determining a physician's board-certification status, largely because of inconsistencies regarding the qualifications and range of practice of a specialist. One study demonstrates a significant disparity between the number of physicians listed under the physician specialty headings in the Yellow Pages and the number of physicians listed in the *Directory of Medical Specialists* as board certified (511). In the current system, physicians can designate as their specialty an area in which they have had no or little training. Thus, consumers could be confused or misled by specialty designations. In most States except for Maryland, there is no system in place to sub-

stantiate that specialists have been trained in their practice areas.¹⁹

As noted earlier, requirements may vary substantially among the many boards that claim to certify physicians. For some boards, a set fee may be the only prerequisite for certification. A consumer uninformed about different types of certification may falsely assume that certification from a particular board is significant.

¹⁹In 1985, the Maryland General Assembly enacted legislation prohibiting physicians from presenting themselves to the public as specialists unless identified by the Maryland Board of Medical Examiners. Although any physician licensed in Maryland may apply for specialty designation, only physicians certified by the American Board of Medical Specialties are allowed automatically to publicly designate themselves as specialists. Other physicians must complete a form outlining specific training and experience in the requested specialty. The forms are reviewed for completeness and then referred to a multispecialty peer-review committee of the State medical society for evaluation. The Maryland Board of Medical Examiners makes the final decision on the basis of recommendations from the committee. The identification is permanent, and the physician may publicize himself or herself in that area of specialty (Annotated Code of Maryland, 10.32.09).

CONCLUSIONS AND POLICY IMPLICATIONS

Certification by the American Board of Medical Specialties or the Advisory Board for Osteopathic Specialists enables consumers to identify those physicians who meet a standard set of qualifications, including specific training in a specialty field and passing a certification examination. Consumers should be made aware, however, that such certification is not a reflection of the amount of practical experience a physician has in a specialty area or an adequate measure of demonstrated proficiency in the field.

The low predictive power of current methods of assessing physician performance limits the validity of board certification as an indicator of high-quality care. Furthermore, board certification is not an indicator of quality that is generalizable across specialties, diagnoses, or procedures. An accurate measurement of a physician's performance requires that many diagnoses in the physician's specialty area be evaluated and interpreted individually.

Consumers should also be made aware that in most States, the fact that physicians designate themselves specialists does not necessarily mean that they have had advanced training in the specialty field corresponding to the area of their practice. To establish whether physicians are practicing in an area that correlates to their training, a consumer must verify that a physician's designated areas of practice match published listings of board-certification status. If a physician "specialist" is not board certified in any specialty field, there is no reliable method for a consumer to verify that the physician has had advanced specialty training.

To strengthen the validity of the relationship between board certification and clinical performance would require improving the reliability and validity of the specialty board evaluation proce-

²⁰Although Medicare's conditions of participation for hospitals once used board certification as a requirement for participation, the conditions have since changed (FR 22021-22023, 1986). The current conditions of participation with respect to a hospital's medical staff require the hospital governing board to "ensure that under no circumstances is the accordance of staff membership or professional privileges in the hospital dependent solely upon certification, fellowship, or membership in a specialty body or society" (641).

dures. The American Board of Medical Specialties recognizes this need and is involved in various studies working towards improving the predictive power of its specialty boards' evaluation processes (21).

The recertification of physician specialists would increase the reliability and the validity of certification. Recertification procedures could maintain the significance of board certification over time and would encourage physicians to update their skills. Although 16 boards recognized by the American Board of Medical Specialties have adopted some form of recertification, 7 boards still have not. Directories that list certification and recertification dates for specialists are publicly available, but consumers may not be aware of them (17,31).

Unfortunately, recertification would assure the public of the quality of care provided by only those physicians who hold a specialty certificate. Mandatory recredentialing (using valid performance assessment methods) for all licensed physicians would establish a more comprehensive system and would reassure the public of a physician's clinical competence²¹

Performance assessments through medical audits would increase the predictive power of the certification/ recertification process. The shift from a knowledge-based to a performance-based assessment, by making the process more a reflection of a physician's actual practice, would increase the validity of board certification. Langsley of the American Board of Medical Specialties writes, "Competence represents the potential for performance, but only performance assessment demonstrates that such potential is used in actual professional practice" (364).

²¹In response to New York State Governor Mario Cuomo's proposal to require periodic reviews to measure physicians' clinical competence, an advisory committee agreed upon a plan to use examinations, peer review, or audits of office practice (similar to the systems used in Canada) to assess physicians who are not affiliated with a hospital (86). To determine the competence of physicians with hospital privileges, the committee is considering using hospital review systems that currently accredit physicians. A strong force behind this recredentialing initiative is a concern for the 10,000 to 15,000 non-hospital-affiliated physicians in New York who are subject to little peer review and critique (362).



Photo credit: George Washington Medical Center

To prevent specialty designations from misleading consumers, there is need of a system to substantiate that physicians who represent themselves as being specialists have been trained in the specialty area in which they practice. A law enacted by the Maryland General Assembly prohibits physicians from representing themselves as specialists unless they demonstrate sufficient training and experience in the relevant specialty to the Maryland Board of Medical Examiners. Other State medical boards could be encouraged to implement similar systems to ensure that only physicians with special training are advertising themselves as specialists.

Physician specialization in conjunction with other criteria, such as years of practical experi-

To improve the validity of physician specialization as an indicator of quality, State medical boards could be encouraged to prohibit physicians from representing themselves as specialists unless they demonstrate sufficient training and experience in the relevant specialty. and experience in the relevant specialty. ence or other verifications of a physician's clinical competence, would be a more significant indication of the quality of a physician's care than physician specialization alone. Most hospitals use a comprehensive credentialing process to delineate specific procedures that physicians are competent to perform depending on their qualifications. With a strong credentialing system in place, consumers can know that physicians on hospital staffs meet certain qualifications. Board certification or practicing in one's area of specialty training may be among the criteria in making this determination. Since these measures do not completely determine a physician's competence, however, hospitals also use other data to grant clinical privileges to physicians. The Joint Commission on the Accreditation of Healthcare Organizations

requires that "professional criteria" be used for granting clinical privileges. These criteria include current licensure, relevant training or experience, current competence, and health status.

Perhaps a more rigorous system for evaluating specialized skills of physicians than the current process used for board certification would provide a more useful indication of the quality of a physician's care. The American College of Physicians, as a part of its Clinical Privileges Pilot Project, has developed guidelines defining minimum skills, education, and training that physicians need to perform competently eight specific medical procedures.²² Although intended to assist hospitals by furnishing objective standards to assess clinical competence and delineate hospital privileges, these guidelines may be useful in assessing the competence of physicians performing these procedures on an ambulatory basis, where clinical review is less common.

Guidelines for granting physician privileges to perform specific procedures are also being developed by other organizations. The American Association of Urology set up guidelines for the training of physicians in the use of the extracorporeal shock-wave lithotripsy.²³ In addition, in 1987, a task force from the American College of Cardiology proposed training standards for performing coronary angioplasty.²⁴

²²So far guidelines have been developed for renal biopsy, acute hemodialysis, acute peritoneal dialysis, continuous arteriovenous hemofiltration, flexible fiberoptic sigmoidoscopy, colonoscopy, esophagogastroduodenoscopy, and endoscopic retrograde cholangiopancreatography. These guidelines, which have become official policy of the American College of Physicians, were based on medical literature and expert consensus. Approximately 4,200 general internists and subspecialists were surveyed as part of the pilot project to obtain more objective data about the experience and training necessary for competence in the procedures. A project to develop guidelines for a number of other procedures in all subspecialties of internal medicine is planned for 1988 (24).

²³To obtain a certificate of training for this procedure, a physician is required to have had days of training and to have performed 15 procedures. Most hospitals require that a physician be certified in the use of the lithotripter before he or she is allowed to perform the procedure. The Association also approves potential sites where lithotripsy training can take place (380).

²⁴The task force calls for "three levels of training for three types of cardiologists: those doing cardiac catheterization or angiography, those doing both, and those doing both plus angioplasty or other advanced procedures that may be developed" (22). The guidelines state that the physician training to perform angioplasty must complete a fourth year of residency training and a minimum of 125 coronary angioplasty procedures, including 75 as primary opera-

To date, delineated qualifications for physicians performing specific procedures are mostly in the form of guidelines. In actuality, any licensed physician could perform any number of complicated surgeries or medical procedures unrestrictedly. Many procedures are done at ambulatory clinics or "surgicenters," where there may not be a formal physician credentialing system in place. In these settings, there is a need to assure the public that the physicians performing these procedures are competent and well qualified. Perhaps the certificates of special competence currently offered by specialty boards could be used for this purpose. The qualifications needed by a physician to acquire such a certificate could be made more rigorous—instead of representing only the passing of an examination, perhaps representing a delineated amount of training, experience, and competence that the physician has acquired in performing the procedure. The qualifications required for a physician to obtain a certificate of special competence could be those credentials demonstrated to relate to better outcomes of patient care.

To encourage physicians to acquire the special training and experience to perform procedures, those physicians who hold such certificates could be reimbursed by Medicare at a higher rate. A more stringent regulation might be to require under Medicare's conditions of participation that a physician hold a certificate of special competence.

Additional research is needed to explore the qualifications of physicians that relate to improved quality of care. Research on specific procedures, similar to the studies of the American College of Physicians on eight specific medical procedures (24), is needed to determine an adequate standard of training and experience for physicians to perform the procedures.

Also needed is research that evaluates board certification and physicians practicing in their area of training by type of specialty. The conditions or procedures chosen to be evaluated within each study should be conditions that are highly prevalent among the types of patients a particular spe-

tor. The task force also calls for a "certifying process for a certificate of added experience and qualification in advanced cardiac catheterization procedures [such as angioplasty]."

cialist sees, so that they can serve as a valid representation of a specialist's practice. Caution would still be warranted with respect to generalizing from a physician's performance for one condition to performance for other diagnoses.

To increase the validity of various measures of physician performance, further research on various performance assessment techniques needs to be conducted. Techniques with greater predictive

power would increase the significance of board certification as an indicator of the quality of a physician's performance. Validated methods to *assess* physician performance would also increase the significance of other criteria used in determining a physician's competence, such as the certificates of special competence. Consumers could then rely more heavily on these criteria as acceptable indicators of quality care.