

CHAPTER

1

**Medical education in
the United States:
Supporting long-term
delivery system reforms**

Medical education in the United States: Supporting long-term delivery system reforms

Chapter summary

Spending an estimated \$9 billion in 2008, Medicare is the largest financial supporter of graduate medical education. Averaging almost \$100,000 per resident per year, Medicare subsidizes education and training for about 90,000 residents in more than 1,100 hospitals through direct and indirect payments for graduate medical education. To some extent, this federal support signals the societal value the Congress places on educating and training our physicians. Despite this spending, however, a number of reports and articles have expressed concern that our health professionals are not gaining certain skills they need to provide the kinds of care that will best serve the public's needs.

Reforming medical education will be a key component in transforming the nation's health care delivery system from one that historically has focused on care for acute illness—at the expense of chronic condition management, coordination of care across settings, and disease prevention—to one that values patient-centered care, quality improvement, and resource conservation. Our medical schools and residency programs need to emphasize a set of skills and knowledge

In this chapter

- Process of becoming a physician and continuing practice
- Accreditation and certification organizations
- Medicare's subsidies for graduate medical education
- Medical education should support needed delivery system reform
- Financial incentives and regulatory barriers discourage nonhospital residency rotations
- Work for future exploration

that will equip students and residents to practice and lead in reformed delivery systems that work under restructured payment incentives.

In considering ways to reform both health care delivery and medical education and training in the United States, this chapter offers an initial focus on physicians. Specifically, it reviews the multifaceted process of becoming a practicing physician, including the organizations involved in accreditation and certification; the costs and benefits for hospitals and physicians involved in teaching and supervising residents; internal medicine residency programs' curricula as they relate to health delivery system reforms; and the financial disincentives and regulatory issues that discourage residency rotations in nonhospital settings.

Residency programs' curricula are not well aligned with objectives of delivery system reform—To learn about how selected curricula are presented in residency programs, we contracted with RAND researchers to conduct a series of semistructured interviews with directors from 26 internal medicine residency programs. This study found that, although most programs provide at least some formal instruction in selected topics essential for delivery reform (e.g., care coordination across settings), overall their curricula fall far short of instruction recommended by the Institute of Medicine and other experts (Cordasco et al. 2009). Of particular concern is the relative lack of formal instruction and experience in multidisciplinary teamwork, cost awareness in clinical decision making, comprehensive health information technology, and patient care in ambulatory settings. Reform-related topics that were reported to be covered more consistently in residency programs are evidence-based medicine and communicating with patients about end-of-life care. As may be expected, researchers found large variations in the extent of and approach to teaching, and program directors reported multiple factors that facilitate or impede their ability to instruct in topics related to delivery system reform. Faculty expertise in selected topics, such as quality measurement, can strongly influence residents' skills and experience.

Financial incentives and regulatory issues discourage nonhospital residency experience—Residency programs are largely based in teaching hospitals. These hospitals face financial and regulatory incentives to keep residents in the hospital for their education and training rather than encourage them to rotate to nonhospital settings. Consequently, residents spend most of their time involved in caring for acutely ill hospital inpatients. This hospital-based experience provides residents with important skills for treating serious illnesses, but it must be balanced with sufficient education and training in nonhospital and community-based settings. Devoting too much resident time in the hospital setting can be problematic, as most of the medical conditions that practicing physicians confront are, and should be, managed in nonhospital settings (e.g., physician offices, nursing facilities, and patient homes). The development of skills in these nonhospital settings is important for patient health, patient comfort, and health care spending.

While accreditation organizations specifically require ambulatory experience for many specialties, Medicare places no requirements on residency programs. Many programs satisfy their accreditation requirements for ambulatory care through residency rotations in hospital outpatient departments, rather than nonhospital settings. The reluctance of teaching hospitals to have residents rotate outside the hospital can be attributed to historical patterns of medical education, regulatory issues, and financial incentives. For example, under current statute and regulations, in certain circumstances, when residents rotate to nonhospital settings, teaching hospitals may lose some of the funding they could otherwise receive through Medicare's graduate medical education payments. Hospitals face an even greater financial incentive to keep residents within the hospital to retain the clinical labor that residents provide.

Future issues for exploration—Future Commission work will stem not only from the findings of work presented in this chapter but also from exploring other issues and questions on the topic of medical education in the United States. Thus, in addition to analyzing specific ways to encourage more

residency experience in nonhospital settings, further analysis will focus on three main areas:

- *Linking delivery system reforms to medical education incentives*—The Commission recognizes that residents and other health care professionals will best learn the skills needed to provide high-quality, efficient care when medical education occurs in settings where such care is actually performed. Thus, the Commission will explore policies that might link medical education incentives with delivery system reforms.
- *Structuring medical education subsidies to produce the professionals we need*—Among physicians, nurses, and physician assistants, medical education incentives could be helpful in achieving the optimal balance of generalists and specialists to help reform our health care delivery system. The Commission will examine possible ways to address this issue as well as ways to increase the diversity of medical school enrollment.
- *Enlisting other payers to contribute explicitly to medical education*—Considering the shared societal benefits of high-quality medical education for patients of all ages, the Commission will analyze options that expand contributions from other health care payers for medical education. This analysis also could explore potential mechanisms for distributing collected funds equitably and efficiently across settings and programs. ■

Spending an estimated \$9 billion in 2008, Medicare is the largest financial supporter of graduate medical education. Averaging almost \$100,000 per resident per year, Medicare subsidizes education and training for about 90,000 residents in more than 1,100 hospitals through direct and indirect payments for graduate medical education. To some extent, this federal support signals the societal value the Congress places on educating and training physicians. Despite this spending, however, a number of reports and articles have expressed concern that our health professionals are not gaining certain skills they need to perform the kinds of care that will best serve the public's needs (Blue Ridge Academic Health Group 2003, Blumenthal 2002, COGME 2007, Holmboe et al. 2005, IOM 2008, IOM 2003, Ludmerer and Johns 2005, Meyers et al. 2007, Mullan 2009, Weinberger et al. 2006).

Reforming medical education will be a key component in transforming the nation's health care delivery system from one that historically has focused on care for acute illness—at the expense of chronic condition management, coordination of care across settings, and disease prevention—to one that values patient-centered care, quality improvement, and resource conservation. Our medical schools and residency programs need to emphasize a set of skills and knowledge that will equip students and residents to practice and lead in reformed delivery systems that work under restructured payment incentives.

In considering ways to reform both health care delivery and medical education and training in the United States, this chapter offers an initial focus on physicians. In addition to background information on physician education, we examine the federal funding policies that bias medical education heavily toward acute hospital care.

Process of becoming a physician and continuing practice

The process of becoming a practicing physician is multifaceted. It starts with undergraduate preparation, followed by four years of medical school, a minimum of three years of graduate medical education in a specialty, and potentially further instruction in a subspecialty. Physicians must also obtain a medical license in order to practice independently. After completing a residency program, physicians may—and most do—seek specialty board certification. Throughout their years of practice, physicians maintain their medical license through

continuing medical education (CME). They also maintain their board certification by fulfilling a comprehensive, multifaceted mix of requirements over a set period of time (Figure 1-1, p. 8).

Undergraduate preparation

The journey to becoming a physician begins at the undergraduate level, where students must fulfill basic premed coursework requirements (biology, chemistry, mathematics, physics, and English), while maintaining a well-rounded undergraduate experience that includes coursework in humanities and social sciences. Medical schools also look favorably on applicants who volunteer at local hospitals and clinics (AAMC 2009). The average student applies for admission to 13 allopathic medical schools. For the 2007–2008 academic year, more than 42,000 people applied for a little more than 18,000 first-year positions (AAMC 2008a).¹ Almost all medical schools require students to take the Medical College Admission Test, which is a standardized, multiple-choice examination designed to assess students' problem-solving ability, critical thinking, writing skills, and knowledge of science concepts and principles prerequisite to the study of medicine.

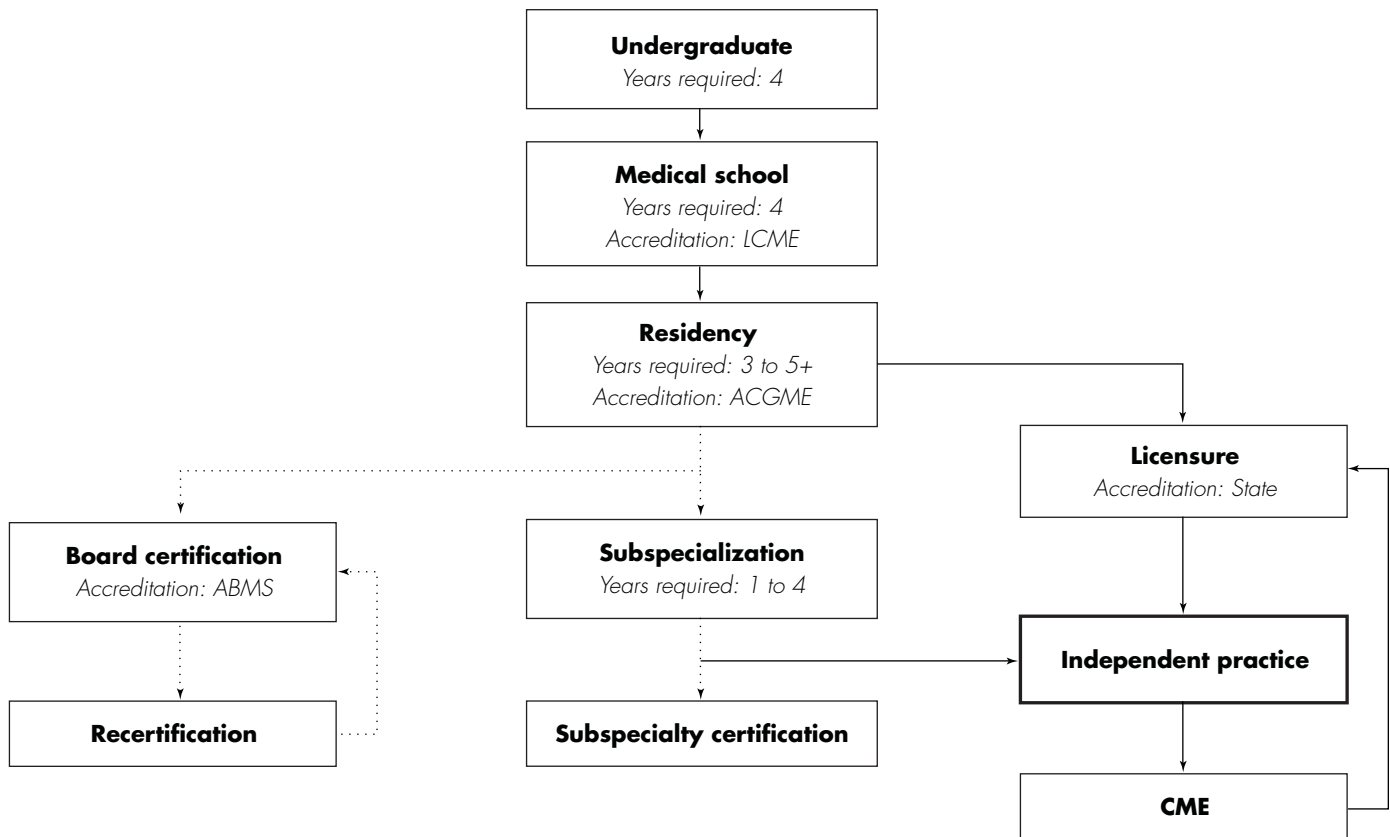
Medical school

Medical school usually lasts four years. Each medical school differs in how it organizes its program. In general, during the first two years, students study the sciences basic to medicine: anatomy, biochemistry, physiology, microbiology, pathology, pharmacology, and behavioral sciences. In addition, they are introduced to basic interviewing and examination techniques. In the third year, students start clinical clerkships, where they gain clinical experience in hospitals and other settings. These third-year clerkships are usually in internal medicine, family medicine, pediatrics, obstetrics and gynecology, general surgery, and psychiatry. In the fourth year clinical rotations continue, although students often focus on specific subfields.

During the fourth year of medical school, students decide on the specialty they want to pursue and participate in the National Residency Matching Program (NRMP), a matching service that uses a computer algorithm to match applicants to programs according to the preferences of the medical students and residency programs.² Through the NRMP, students can choose from 26 core specialties. Virtually all medical students participate in the match to be assigned to a residency program. Only after the match is complete can students who are not successfully matched

FIGURE
1-1

The process of becoming a physician and continuing practice



Note: LCME (Liaison Committee on Medical Education), ACGME (Accreditation Council for Graduate Medical Education), ABMS (American Board of Medical Specialties), CME (continuing medical education). Solid flow lines indicate required paths. Dotted flow lines indicate optional paths. Most physicians seek board certification. Physicians may seek subspecialization after completion of their residency.

attempt to pursue slots left unfilled by the matching process. A match between an applicant and a program is considered a binding commitment.³

Diversity in medical education

Medical students tend to come from relatively affluent families. In 2005, 55 percent of students came from families in the top quintile of family income; only about 5 percent came from families in the lowest quintile (Figure 1-2) (AAMC 2008b). This trend has been fairly consistent for the past 20 years. Given the association of college graduation with family income, some skewing can be expected in medical school enrollment toward higher income families; nevertheless, the U.S. medical school enrollment figures show an overwhelming lack

of economic diversity among students and subsequently among practicing physicians entering the profession.

The racial and ethnic composition of medical school enrollees also is not representative of the population at large (Table 1-1). For instance, for the 2007–2008 academic year, African Americans account for 12.3 percent of the U.S. population, but just 6.3 percent of allopathic and 3.5 percent of osteopathic medical school matriculants (first-year enrollees). Similarly, Hispanics account for 15.1 percent of the U.S. population but just 7.9 percent of allopathic and 3.6 percent of osteopathic medical school matriculants. Asian Americans, on the other hand, make up 4.4 percent of the U.S. population but account for 19.8 percent of allopathic and 17.1 percent of osteopathic medical school matriculants. As in the general

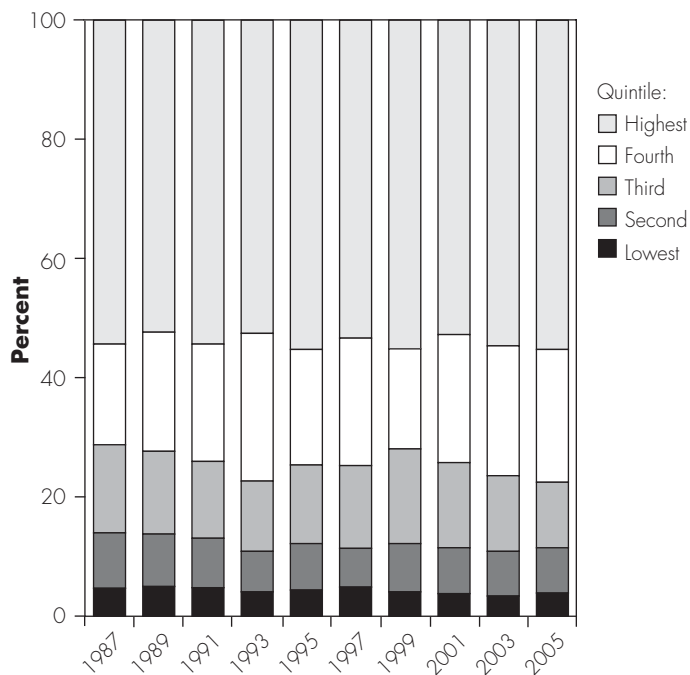
population, whites make up the largest share of students entering medical school.

Table 1-1 also shows that the demographic composition of medical school enrollment roughly parallels the proportion of applications medical schools receive. This suggests that factors such as financial and educational barriers affect students' decisions to apply to medical school and ultimately shape the demographics of the physician workforce. Although college graduation is one factor influencing minority enrollment, the proportion of African Americans and Hispanics in medical school has not increased much over the past decade, despite substantial increases in the number of African Americans and Hispanic students graduating from four-year colleges, including increases relative to whites in the number graduating with majors in biological and biomedical sciences (Grumbach and Mendoza 2008). This growth presents an opportunity for developing strategies to increase diversity in medical school enrollment.

There are a number of benefits to having an ethnically diverse physician workforce, and the Commission is concerned about this issue. Research has shown that a racially and ethnically diverse health care workforce is associated with better access to and quality of care for disadvantaged populations, greater patient choice

FIGURE 1-2

Parent household income of entering medical students in U.S. medical schools, by quintiles, 1987-2005



Source: Association of American Medical Colleges 2008.

TABLE 1-1

Racial and ethnic composition of medical school applicants and matriculants for the 2007-2008 academic year

Race/ethnicity	U.S. population	Medical school			
		Allopathic		Osteopathic	
		Applicants	Matriculants	Applicants	Matriculants
White	66.0%	56.4%	58.9%	59.4%	69.6%
Hispanic	15.1	7.3	7.9	6.4	3.6
Black or African American	12.3	7.2	6.3	5.9	3.5
Asian	4.4	19.6	19.8	19.5	17.1
Native American/Alaskan native	0.9	0.3	0.3	0.6	0.8
Native Hawaiian/Pacific Islander	0.1	0.3	0.2	0.1	*
Other/unknown	1.2	9.0	6.5	8.2	5.4

Note: For the applicants and matriculants groups the "other/unknown" category includes foreign students who are not U.S. residents, individuals with more than one race, and individuals that did not provide their race. Totals may not sum to 100 percent due to rounding.
* Native Hawaiian and Pacific Islander included with Asian.

Source: Association of American Medical Colleges data warehouse applicant matriculant file as of October 10, 2008; American Association of Colleges of Osteopathic Medicine 2009 applicant and first-year enrollment data; and U.S. Census annual estimates of the population by sex, race, and Hispanic origin for the United States: April 1, 2000 to July 1, 2007.

and satisfaction, and better educational experiences for students in health professions (HRSA 2006, IOM 2004a, Komaromy et al. 1996, Mertz and Grumbach 2001, Moy and Bartman 1995). Greater diversity in the health professions would likely lead to improved public health by increasing access to care for underserved populations and by increasing opportunities for minority patients to see practitioners with whom they share a common race, ethnicity, or language. Race, ethnicity, and language concordance, which are associated with better patient–practitioner relationships and communication, may increase patients’ likelihood of receiving and accepting appropriate medical care (HRSA 2006). From an educational standpoint, an ethnically diverse student body has been associated with better performance across all ethnicities on intellectual and civic development (IOM 2004a). As the nation becomes increasingly diverse, a business case can also be made for a health care workforce that is culturally and linguistically diverse and attuned to the population being served (Grumbach and Mendoza 2008).

Medical school students also appear to come disproportionately from urban areas, but research on this correlation is limited (Fordyce et al. 2007). Factors associated with lower rates of medical school enrollment among students from rural areas include lower income and less proximity to medical schools. Research suggests that medical students born in rural areas are more likely to select primary care specialties and to practice in rural areas (Brooks et al. 2002, Phillips et al. 2009). Therefore, geographic diversity among medical school students is important for maintaining access to care across the United States. In general, osteopathic medical schools enroll a proportionately higher share of rural students compared with allopathic medical schools (Peters et al. 1999).

Many decades ago women represented less than a quarter of U.S. medical school enrollees, but they now account for about half of all enrollees.

Student debt

Although medical students are significantly more likely to come from higher income families, many graduate from medical school with sizable student debt from tuition and fees. Only 13 percent of medical students graduate without any educational debt. In 2008, the average student reported a debt load of \$154,600, which is 11 percent higher than for the previous year. Today’s graduates commit about 9 percent to 12 percent of their after-tax income for educational debt service (Steinbrook 2008). More than a quarter of graduates with indebtedness carried a debt

of more than \$200,000 (AAMC 2008c). Medical school students with higher debt are more likely to participate in loan repayment programs for underserved communities, such as the National Health Service Corps (Phillips et al. 2009). However, overall rates of U.S. medical school graduates practicing in these communities have fallen, particularly for primary care.

Graduate medical education

After completing medical school, graduates enter the residency programs to which they are assigned through the NRMP. During residency, residents gain more practical experience in a specific field of medicine. Most residency programs are sponsored by teaching hospitals or medical schools. Teaching hospitals are hospitals that participate in graduate medical education; a large proportion of residents’ education takes place in inpatient and outpatient departments of teaching hospitals.

The length of time of residencies varies by specialty: from three years for the primary care specialties of family medicine, internal medicine, and pediatrics to five or more years for general surgery and other surgical specialties. Some specialties require a preliminary year of residency in internal medicine or general surgery before entering (e.g., dermatology, urology). When physicians graduate from a residency program, they are eligible to take their specialty board certification examinations. After completing a residency program, however, many new physicians subspecialize with additional fellowship years (e.g., cardiology, hand surgery), stretching the total length of education and training an additional one to four years, depending on the subspecialty.

Roughly one-quarter of all residents are graduates of medical schools located outside the United States and Canada. These international medical graduates (IMGs) must also be certified by the Educational Commission for Foreign Medical Graduates (ECFMG) before entering an approved residency. The ECFMG assesses the readiness of IMGs to enter residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME). A higher proportion of IMGs enter primary care residencies than other specialties (Salsberg et al. 2008).

Physician licensure

States maintain their own rules for physicians’ licensure. Licensure occurs through each state’s medical licensing board and involves, among other requirements, passing the three-step United States Medical Licensing Examination

(USMLE). The first two exams take place during medical school, and the third takes place during the first year of residency. To be licensed to practice independently, physicians must also complete a minimum number of years in an approved residency program, which varies by state and is typically one to two years. In most states and under most circumstances, physicians who graduate from an accredited medical school outside the United States or Canada or complete graduate medical education overseas are required to complete an ACGME-approved program before being licensed to practice medicine.

After they have completed their residencies and are licensed to practice, physicians maintain their competencies and licenses and learn about new and developing areas in medicine and their specialty by pursuing CME. Physicians may receive CME credits by attending approved lectures or conferences; reviewing certain publications; or using online programs, audio, video, or other electronic media designed to provide CME credits. All but five states require a minimum number of CME credits to maintain state licensure.⁴ The number of CME credits required varies across jurisdictions; on average, states require 30 credit hours per year, with 11 states requiring as many as 50.⁵ Some states mandate specific types of CME. California, for instance, requires all general internists and family physicians, for whom at least 20 percent of their patient population is 65 or older, to receive at least 20 percent of their CME hours in geriatric medicine or the care of older patients. Other states have requirements on HIV/AIDS care, risk management, and end-of-life palliative care (AMA 2008). In general, physicians are not required to get CME credits in areas related to their practice nor are they required to demonstrate to the state licensing boards what they have learned from CME activities (FSMB 2009).

Specialty certification

After completing a residency, most physicians become board certified in their specialty. Specialty certification is voluntary and not required for state licensure. Many health plans and hospitals, however, require certification for inclusion in networks and hospital privileges. Specialty certification occurs through the medical specialty board for each specialty. To become eligible for board certification in a specialty, a physician must complete an approved residency in that specialty and have an institutional or valid license to practice medicine. A physician who meets these basic admission standards will be evaluated by a specialty board using written and oral examinations.

Because specialties differ so widely, the criteria that inform these tests are quite different (ABMS 2009).

Most specialty boards require physicians to pass recertifying exams and meet other requirements to maintain their certification, also referred to as maintenance of certification (MOC). These other requirements include a minimum amount of CME relevant to their specialty and evidence of participation in practice-based assessment.⁶ The time cycle for recertification is 6 to 10 years depending on the specialty. Some physicians, however, are grandfathered out of MOC requirements depending on their specialty and year of initial certification.

Accreditation and certification organizations

All education components along the path to becoming a practicing physician involve accreditation or licensure. Allopathic and osteopathic medical schools have their own accrediting organizations—the Liaison Committee on Medical Education (LCME) and the American Osteopathic Association (AOA) Commission on Osteopathic College Accreditation, respectively. In 2007, 129 accredited medical schools enrolled 17,759 first-year students (AAMC 2008a); 25 accredited osteopathic schools enrolled 4,528 first-year students (AACOM 2009). Accreditation standards for these schools cover a wide range of requirements, including clerkship setting requirements, education curricula, and educational resources.

Residency programs may be accredited by the ACGME or the AOA, or they may be dually accredited. In the 2007–2008 academic year, there were a total of 8,589 ACGME-approved residency programs, with 106,012 residents and fellows—an increase of 7.9 percent from the 2002–2003 academic year. The number of first-year residents totaled 23,759, an increase of 8.7 percent from five years earlier. International medical graduates accounted for 28.6 percent of first-year enrollment (Brotherton and Etzel 2008). In the 2007–2008 academic year, there were 223 AOA-approved internships and 718 AOA-approved residency programs with 4,934 osteopathic residents (Freeman and Lischka 2009).

Completing an accredited residency program is important for a number of reasons. All states, for example, require completion of a minimum number of years of an accredited residency before being granted a license to practice independently. Medicare also requires residency

programs to be accredited to receive medical education funds from Medicare.⁷ Finally, physicians must complete an accredited residency program to be eligible for board certification in a specialty. The text box (pp. 14–15) describes the process ACGME uses for residency program accreditation.

Although medical school, graduate medical education, and specialty certification are governed by separate accrediting agencies, many of their appointees come from some of the same pool of medical organizations (Table 1-2). For example, the American Medical Association and the Association of American Medical Colleges appoint members to the bodies that accredit medical schools (LCME) and residency programs (ACGME). Specialty groups are represented in the residency review committees (RRCs), which also govern specialty certification decisions for physicians. Some of the specialty boards have worked closely with the ACGME and RRCs in developing some of the changes that have taken place in the accreditation process. The groups represented in these accrediting agencies are also closely involved in providing undergraduate, graduate, and continuing medical education, including teaching hospitals and physician educators.

The interrelatedness of these organizations creates both benefits and concerns. Overlaps of the governance of these organizations for multiple purposes can help ensure some consistency and logical flow across the different points of the medical education continuum. However, the interrelatedness of accrediting bodies and their potential incentives for maintaining the status quo raise some concerns about reforming medical education policies. Several experts and researchers have discussed the possible role of an independent board in making decisions about allocating funding for medical education (COGME 2007, IOM 2003, Pew Center for Health Professions 1998, Whitcomb 2007). Another option is to increase the share of public members participating in the governance of these accrediting and certifying organizations.

Medicare's subsidies for graduate medical education

Since its inception, Medicare has subsidized much of graduate medical education in the United States. When the Congress created Medicare in 1965, it recognized the societal benefits of medical education and specified

that the Medicare program support its share of medical education costs, until the community determined other means.

Educational activities enhance the quality of care in an institution, and it is intended, until the community undertakes to bear such education costs in some other way, that a part of the net cost of such activities (including stipends of trainees, as well as compensation of teachers and other costs) should be considered as an element in the cost of patient care, to be borne to an appropriate extent by the hospital insurance program (U.S. House 1965, U.S. Senate 1965).

Currently, Medicare's subsidy is provided through both direct and indirect payments to teaching hospitals. In total, Medicare's payments for graduate medical education account for about \$9 billion annually—an average of almost \$100,000 per resident.

Payments toward direct and indirect costs

Direct graduate medical education (GME) payments are designed to fund the teaching aspects of residency programs—resident salaries and benefits, supervisory physician salaries, and administrative overhead expenses. Direct GME payments are based on a hospital-specific per resident payment amount for which Medicare pays its share. These payments, which go to teaching hospitals, totaled \$2.9 billion in 2007. See the text box (pp. 16–17) for more details on Medicare's direct GME payment.

Medicare also provides a small amount of education funding to hospitals to support direct costs of hospital-based education and training programs for nursing and various allied health professions.⁸ In future work, the Commission may examine ways to provide more support for nursing education, as nurses are key professionals in delivering coordinated patient care.

The indirect medical education (IME) adjustment is a percentage increase (or “add-on”) to the inpatient prospective payment system rate that varies with the intensity of hospitals' residency programs. The IME adjustment was developed to account for the higher costs of patient care associated with care in teaching hospitals, such as unmeasured patient severity, residents “learning by doing,” and greater use of emerging technologies. Because Medicare's IME payments are tied to Medicare inpatients, teaching hospitals in communities with smaller shares of Medicare beneficiaries receive proportionately lower total IME payments per resident.

**TABLE
1-2**

Multiple accrediting organizations are involved in physician education and practice

Type of certification/accreditation

	Medical school	Graduate medical education	Specialty certification	State licensure	Continuing medical education
Accrediting organization	LCME	ACGME	ABMS	State medical boards	ACCME
Purpose	Accreditation of medical schools.	Accreditation of GME programs and institutions sponsoring GME programs.	Assist member boards in developing standards for certification of physicians in a given specialty.	License physicians, investigate complaints, and discipline physicians who violate the law.	Sets standards and accredits organizations and institutions that offer CME.
Governance	<i>17 members:</i> <ul style="list-style-type: none"> • 6 AAMC • 6 AMA • 2 students • 2 public • 1 CACMS 	<i>25 members:</i> <ul style="list-style-type: none"> • 4 AAMC • 4 AHA • 4 AMA • 4 ABMS • 4 CMSS • 3 residents • 2 public • 1 government observer 	<i>27 members:</i> <ul style="list-style-type: none"> • 1 from each specialty board • 3 public 	Volunteer physicians and members of the public, in most cases, appointed by the governor. Total of 57 state medical boards.	<i>17 members:</i> <ul style="list-style-type: none"> • 3 AAMC • 3 ABMS • 3 AHA • 3 AMA • 1 AHME • 3 CMSS • 1 FSMB
Related organizations	ECFMG Certifies eligibility of graduates of non-LCME accredited medical schools. <i>Members from:</i> <ul style="list-style-type: none"> • AAMC • ABMS • AHME • AMA • FSMB • NMA 	RRCs Develop specialty-specific guidelines for accreditation. 24 separate RRCs for each major specialty. <i>Members from:</i> <ul style="list-style-type: none"> • AMA • Specialty boards • Specialty societies 	Specialty boards Develop guidelines for certification and recertification. 24 separate boards for each major specialty. <i>Members:</i> Physicians distinguished in teaching, research, or patient care	FSMB Cosponsors USMLE exam. Verifies physician credentials and maintains data bank on disciplinary actions. <i>Members from:</i> 57 state medical boards	State medical societies Approve state-specific CME <i>Members:</i> Individual physicians in a state.

Note: LCME (Liaison Committee on Medical Education), ACGME (Accreditation Council for Graduate Medical Education), ABMS (American Board of Medical Specialties), ACCME (Accreditation Council for Continuing Medical Education), GME (graduate medical education), CME (continuing medical education), AAMC (Association of American Medical Colleges), AMA (American Medical Association), CACMS (Committee on the Accreditation of Canadian Medical Schools), AHA (American Hospital Association), CMSS (Council of Medical Specialty Societies), AHME (Association for Hospital Medical Education), FSMB (Federation of State Medical Boards of the U.S., Inc.), ECFMG (Educational Commission on Foreign Medical Graduates), NMA (National Medical Association), RRC (residency review committee), USMLE (United States Medical Licensing Examination).

Source: MedPAC analysis of information from each of the accrediting organization's public websites.

When an IME adjustment was developed for Medicare's inpatient prospective payment system in 1983, it was set at double the empirical relationship between teaching intensity and costs per case, based on analysis estimating that teaching hospitals would not perform well financially under the new prospective payment system (Lave 1985). With the doubled adjustment, however, teaching hospitals performed much better than other hospitals. Despite

some reductions in the IME adjustment over time, the Commission's analysis has shown that the current IME adjustment of 5.5 percent is set at more than twice the estimated relationship between teaching intensity and costs per cases (MedPAC 2007). In 2007, IME payments totaled \$6.0 billion. The text box (pp. 16–17) provides additional details on Medicare's IME adjustment.

Summary of the Accreditation Council for Graduate Medical Education residency program accreditation process

The Accreditation Council for Graduate Medical Education (ACGME) accredits individual residency programs and the institution sponsoring the programs. The work of reviewing the programs and making accreditation decisions is carried out by 27 residency review committees (RRCs), 1 for each major specialty and 1 for transitional year programs. An institutional review committee accredits the institutions that sponsor residency programs. RRC members are volunteer physicians appointed by the appropriate medical specialty organization, medical specialty board, and the American Medical Association Council on Medical Education.

ACGME field staff representatives conduct one-day site visits to programs once every two to five years, depending on the strength of the program. They visit about one-third of the programs in a given year. The field staff representatives produce reports on the programs they visit based on lengthy interviews with program directors, faculty, and residents as well as a review of supporting documents. The RRCs, which on average meet three times a year, review the site visitors' reports along with data provided by the programs. The RRC members then vote on the appropriate

accreditation action to take for each program on the agenda for that meeting.

Program requirements

To meet accreditation standards, programs must fulfill the requirements set up by the RRCs for the individual specialties. The ACGME has established a set of common program requirements or general competencies that all programs are required to integrate into their curriculum: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. (The text box on pp. 20–21 describes these subject areas.)

The movement to a competency-based system of accreditation is part of the Outcome Project, a long-term initiative that started in 1999, by which the ACGME is increasing emphasis on educational outcome assessment in the accreditation process. The shift in emphasis to outcome assessment is reflected in requirements for programs to:

- identify learning objectives related to the ACGME general competencies,

(continued next page)

The sum of Medicare's graduate medical education payments can be divided into three components, as illustrated in Figure 1-3. Two components reflect empirical costs discussed earlier: the cost of operating residency programs and the higher costs of patient care associated with educating and training residents. The third component is the extra IME payment that remains because the IME add-on is set at a percentage more than twice what can be empirically justified. In past reports, the Commission has recommended that part of the extra payment for IME be used to support a pay-for-performance program for all hospitals. The other two components—the direct GME and the empirically based portion of the IME payment—could be affected by policies that target funding to the type of settings and educational programs that best meet our health care needs.

Number of residents that Medicare supports

In 2006, Medicare provided direct GME support to hospitals for about 89,600 full-time equivalent (FTE) residents and fellows.⁹ On average, hospitals received more than \$70,000 in IME payments and \$30,000 in direct GME payments for each FTE resident eligible for Medicare funding. Regulations for counting eligible FTEs for direct GME and IME payments are complex and vary, so the numbers Medicare supports through direct GME and IME payments differ. For the IME payment adjustment, Medicare supported 79,800 FTE residents in inpatient prospective payment system hospitals. For each teaching hospital, Medicare limits the number of residency positions it supports through a hospital-specific cap on medical education subsidies. However, hospitals may hire

Summary of the Accreditation Council for Graduate Medical Education residency program accreditation process (cont.)

- use increasingly more dependable (i.e., objective) methods of assessing residents' attainment of these competency-based objectives, and
- use outcome data to facilitate continuous improvement of both resident and residency program performance (ACGME 2008).

The Outcome Project is now in its third phase, which began in 2006, with full integration of the competencies and their assessment with learning and clinical care. The fourth phase, which will begin in 2011, will be an expansion of the competencies and their assessments to develop models of excellence, by identifying benchmark programs and adopting generalizable information about emerging models of excellence

(ACGME 2008). The ACGME is also moving toward an evaluation system for programs that would be annual rather than every five years (Nasca 2008).

Before the Outcome Project, graduate medical education accreditation was based on a "minimal threshold model," by which programs were judged according to how they complied with minimum standards established by the RRCs and the ACGME. In the Outcome Project's competency-based model, programs are asked to show how residents have achieved competency-based educational objectives and, in turn, how programs use information drawn from evaluation of those objectives to improve the educational experience of the residents (ACGME 2008). ■

additional residents; in 2006, hospitals had more than 8,000 FTE residents for whom they did not have Medicare funding because the hospitals had exceeded their Medicare cap.¹⁰ Preliminary research using cost report data suggests that hospitals that exceed Medicare's cap have a smaller proportion of residents in primary care specialties than hospitals that do not exceed the cap.

Non-Medicare funding sources for graduate medical education

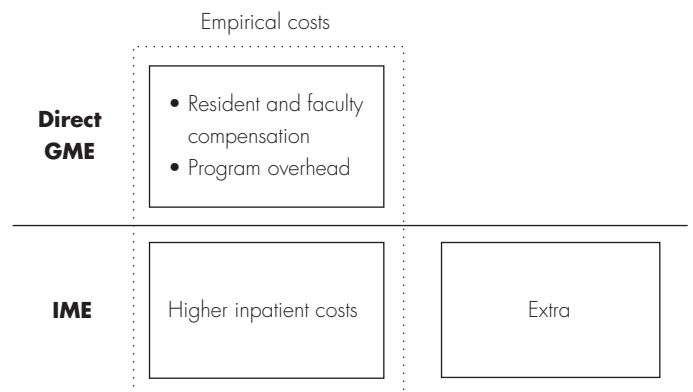
The aggregate spending from all payers for graduate medical education is not well known (Wynn et al. 2006). Although Medicare is the largest single contributor to graduate medical education, other funding sources exist, mostly through federal and state programs. For example, state Medicaid programs contribute more than \$3 billion annually to graduate medical education financing. In addition, the Department of Veterans Affairs (VA) supports more than 9,000 resident FTEs and allows more than 30,000 residents and fellows to rotate through its hospitals each year. The Department of Defense supports the education and training of about 3,000 residents. The Children's Hospital Medical Education Program administered by the Health Resources and Services Administration (HRSA) provides \$300 million to support direct and indirect GME costs. Some Title VII grants administered by HRSA are also used to support residency

programs in primary care and geriatrics, but funding for these programs is relatively low and has been reduced in recent years.

Teaching hospitals may also receive resources from their medical school affiliations, research grants, endowments, and foundation grants. Some private insurers contribute to

FIGURE 1-3

Current Medicare subsidies for graduate medical education



Note: GME (graduate medical education), IME (indirect medical education). "Extra" refers to the aggregate amount of IME payments that exceed empirically calculated IME costs.

Medicare payments for direct graduate medical education (GME) and indirect medical education (IME)

Direct GME payments

Direct GME payments are based on hospital-specific per resident costs in a base period, updated each year for inflation by the consumer price index for all urban consumers (CPI-U). A hospital's payment is the product of three factors:

- the hospital's updated per resident payment amount;
- a weighted count of full-time equivalent residents supported by the facility; and
- the hospital's Medicare patient share, based on the ratio of Medicare patient days to total patient days in the acute inpatient setting.

Medicare direct GME payments totaled about \$2.9 billion in 2007. Medicare makes direct GME payments to short-stay acute care hospitals as well as other types of hospitals supported by the Medicare program (cancer, children's, long-term care, psychiatric, and rehabilitation hospitals).

Hospitals' per resident payment amounts are based on their total per resident costs in 1984 updated for inflation. A floor rate was set at 85 percent of a locality-adjusted national average under the Medicare, Medicaid, and SCHIP Benefits Improvement and

Protection Act of 2000, which also eliminated annual CPI-U increases in the rates from 2001 through 2013 if a hospital's per resident amount is 140 percent or more of the locality-adjusted national average. The per resident payment amounts also depend on the residents' specialties. Payments are about 6 percent higher for residents in primary care specialties (family practice, general internal medicine, general pediatrics, and obstetrics and gynecology) and some selected specialties (geriatrics and public health and preventive medicine) than for other specialties. There is no differential in payments by specialty for hospitals that established residency programs after 1995 or for hospitals that are at the floor rate.

The weighted count of residents used in the payment formula is based on a three-year rolling average. The resident counts for most hospitals are also capped at their 1996 levels because of concern that the payment formulas were providing a strong incentive for hospitals to increase the number of residents in their programs.¹¹ Residents in their initial residency period—the minimum period required for board certification in the first specialty program entered after medical school, up to a maximum of five years—are given a weight of 1.0. Residents who pursue a second specialty or a subspecialty or who spend longer in their initial residency period are given a weight of 0.5.

(continued next page)

supporting graduate medical education indirectly through higher patient care payments provided to teaching-affiliated health care providers. A small number of states require private insurers to contribute explicitly to graduate medical education. However, in most states private insurers generally do not make specific payments to providers for direct or indirect medical education costs.

Medicare payments to teaching physicians for services when supervising residents

When supervising residents, teaching physicians are permitted to bill Medicare for Part B services that their residents perform. Residents may not bill for these

services.¹² For payment, Medicare requires that the supervising physician be physically present during the critical or key portion of the service being provided or actually perform this portion of the service. In addition, the supervising physician must supply more than his or her signature in the clinical documentation for the service. Specifically, the supervising physician must document who provided what portions of the service and that the supervisor was present during the critical or key portion of the service and participated in management of the patient. These regulations apply to services provided under Medicare's physician fee schedule in hospital and nonhospital settings. In certain circumstances, Medicare relaxes the supervision requirements for primary care

Medicare payments for direct graduate medical education (GME) and indirect medical education (IME) (cont.)

A hospital's Medicare patient share is the proportion of its Medicare acute care inpatient days to its total acute care inpatient days. The formula for direct GME payments for Medicare Advantage patients is the same, but the Medicare patient share is based on Medicare Advantage patient days to total days.

IME payments

The IME adjustment is a percentage add-on to a hospital's inpatient prospective payment system payments that varies with the intensity of the hospital's residency programs. The IME adjustment is currently set so that operating payments increase approximately 5.5 percent for each 10 percent increment in resident intensity, measured by the ratio of residents to hospital beds.¹³ Because IME payments are an adjustment to base payment rates, a hospital's IME payments are tied to its volume and mix of Medicare cases as well as its number of residents. As is the case with direct GME payments, the number of residents included in the resident-to-bed ratio is also capped. Medicare IME payments totaled \$6.0 billion in 2007.

While the IME adjustment is intended in part to pay for the indirect costs of running a teaching program, the current IME adjustment of 5.5 percent substantially

exceeds the estimated relationship between teaching intensity and costs per case. The Commission's analysis has shown that Medicare inpatient costs per case (operating and capital costs combined) increase about 2.2 percent for every 10 percent increase in the ratio of residents to hospital beds (MedPAC 2007). The current IME adjustment is thus set at more than twice what can be empirically justified, directing more than \$3 billion in extra payments to teaching hospitals above the effect that educating and supervising residents and fellows has on the cost of caring for Medicare patients. These funds are currently provided to teaching hospitals without any restriction on how they are used; teaching hospitals report that they use this extra payment amount for mission-driven activities, such as trauma-center care. To encourage quality improvement, the Commission believes some of these funds should be made available to all hospitals that provide high-quality care. The Commission therefore recommended in its 2007, 2008, and 2009 March reports that the IME adjustment be reduced from 5.5 percent to 4.5 percent per 10 percent increment in the resident-to-bed ratio and that the funds obtained from reducing the IME adjustment be used to help finance quality-incentive payments. ■

services but increases the requirements for surgical, high-risk, or other complex procedures.

In the middle to late 1990s the Department of Health and Human Services' Office of Inspector General undertook a series of audits of physician services at teaching hospitals. These were called the Payment for Academic Teaching Hospitals (PATH) audits. Since they took place, CMS and teaching hospitals have increased their focus on ensuring compliance with the supervision rules.

Economic costs and benefits of participating in teaching activities

To varying degrees, participation in graduate medical education provides both costs and benefits to hospitals and physicians. With respect to direct costs, teaching hospitals

incur the expenses associated with operating a residency program, including salary and benefit costs of residents, faculty supervisory costs, and program overhead expenses. Other types of costs include facility infrastructure expenses, such as maintaining an extensive medical library for residents to conduct clinical research, providing office space for supervisory faculty, providing on-call rooms for residents, and adopting expensive technologies. Teaching hospitals also experience added indirect costs such as higher costs of patient care from residents learning by doing, from ordering more services (e.g., diagnostic tests and imaging), and from taking longer to perform procedures.

Alternatively, teaching hospitals benefit in many ways from having residents, and overall the number of residents in

accredited programs has increased 30 percent during the last two decades (Salsberg et al. 2008). Benefits to teaching hospitals include, for example, Medicare and Medicaid payments to hospitals toward the direct and indirect costs of residency programs described earlier. Moreover, Medicare's indirect payments are currently set so hospitals receive payments that are more than double the indirect costs. Hospitals also benefit by having residents available for on-call coverage and to assist in providing patient care. In many cases, resident wages are lower than those of other health professionals who could perform these duties, thus affording hospitals some gains in staffing costs (Rich et al. 2002). Teaching hospitals and affiliated physicians also benefit from the prestige associated with being involved in physician education and training. The last two factors—greater physician staffing and prestige—can lead to higher patient volumes, as patients and community physicians favor these facilities. With prestige may also come the ability to garner higher prices in negotiations from private payers to help cover these institutions' higher costs for patient care.

Similarly, physicians experience costs and benefits from their participation in medical education. Depending on the resident's skill level, a supervising physician's productivity may fall because of the extra time needed for activities such as teaching and reviewing clinical documentation with residents. Recent actions regarding medical education—such as rules restricting residents' duty hours to 80 per week and the PATH audits—may have decreased residents' and supervisory physician's output, but research on this topic is limited. One study on surgery showed that surgical operations take longer with resident involvement (Babineau et al. 2004). Another study of residents in an internal medicine practice showed small productivity losses from participating in residency instruction, more so for first-year residents (Johnson et al. 2008).¹⁴ Other supervisory costs include the time involved in negotiating agreements and maintaining paperwork on individual residents. Some practices also incur costs from expanding office space to accommodate residents in their office.

Experienced physicians can also benefit from participation in residency supervision and education. Many are paid by the teaching hospital for their role in educational, supervisory, and administrative activities. Even when physicians volunteer their time, they may receive a faculty appointment, which adds prestige to their practice and may also allow access to other benefits from the educational sponsor, such as medical library privileges. Faculty appointments may help increase practice volume and total patient revenues. In addition, being involved in medical

education allows physicians to keep up with the latest medical research and provides an opportunity to recruit future practice partners. Residents may also help with on-call coverage in physician practices as well as patient preparation and triage—thereby increasing the practice's productivity.

Given the complexities of calculating the costs and benefits of participating in GME, it is difficult to discern whether it is, on net, profitable for providers. Hospitals' and physicians' decision to participate in GME activities may also be driven by their mission focus, such as education and research.

Medical education should support needed delivery system reform

Our health care delivery system is not a true system: care coordination across providers is not routine, fragmented specialist care is often favored over primary care, quality of care is too often poor, and costs are high and increasing at an unsustainable rate. In congressional testimony and in our reports to the Congress, the Commission calls for payment system reforms and other tools to moderate spending while increasing value. To this end, the Commission has recommended the following changes aimed at encouraging physicians to increase care coordination and assume greater accountability for quality and resource use:

- medical home pilot programs for beneficiaries with multiple chronic conditions,
- efforts to measure physicians' use of health care resources and provide feedback results,
- financial disincentives for certain hospital readmissions,
- pilot program for bundled payments for all services provided in a hospitalization episode,
- linking providers' payment to quality, and
- encouraging the use of comparative-effectiveness information and public reporting.

Such reforms in payment policies need to be accompanied by reforms in medical education. This pairing is important to ensure that students and residents learn the skills they need to provide care and leadership in new delivery models under restructured payment and incentives.

These skills include quality measurement and practice improvement, care coordination, multidisciplinary teamwork, cost awareness, and interpersonal skills. Research on internal medicine residency programs (discussed later in this chapter) found several gaps in formal instruction on many of these skills.

Residency experiences are designed to prepare physicians for clinical practices. Thus, exposure to skills such as care coordination during residencies is critical to improving the quality and efficiency of our nation's health care. Recognizing shortcomings, the specialties of internal medicine, family medicine, surgery, and pediatrics have embarked on major redesigns of their residency programs to improve the way residents prepare for practice in their specialty (Whitcomb 2008). Further, recent ACGME requirements in residency program curricula (described in text box, pp. 20–21) also seek to address some of these concerns.

Yet, Medicare—with an enormous financial stake in health care and graduate medical education—has never specifically linked any of its direct GME or IME subsidies to promoting or fostering important goals in medical education. Medicare should consider ways to ensure that residents and other health care professionals obtain the skills they need to provide efficient, coordinated, high-quality care.

Study suggests that curricula in many internal medicine residency programs fall short in topics associated with delivery system reform

A Commission-sponsored study, conducted by RAND researchers, found that, although most internal medicine residency programs provide at least some instruction and experience in topics associated with quality and efficiency improvements, their curricula fall short of recommendations from the Institute of Medicine (IOM) and other experts (Cordasco et al. 2009).¹⁵ This study consisted of semistructured interviews with 26 directors from a representative sample of internal medicine residency programs. It examined several specific formal and experiential curricular activities within the following broad topics:

- practice-based learning, focusing on measuring care quality and improving medical practice;
- system-based practice, focusing on care coordination, multidisciplinary teamwork, cost awareness, and patient safety;

- interpersonal communication, focusing on communication with other providers, patients, and family and on patient education;
- health information technology, including electronic medical records and computer order entry; and
- care settings, focusing on experiences in nonhospital settings.

Of particular concern from the interview findings is the lack of formal instruction and experience in: multidisciplinary teamwork, cost awareness in clinical decision making, comprehensive health information technology, and patient care in ambulatory settings. Formal instruction involves structured and organized educational experiences. Topics that residency program directors reported to be covered with more consistency through formal instruction are evidence-based medicine and communicating with patients about end-of-life care. In all areas, particularly interpersonal communication, directors reported that more experiential learning—with faculty modeling, mentoring, and informal feedback—is the predominant form of instruction. As may be expected, researchers found large variation in the extent of and approach to teaching these topics, and program directors reported multiple factors that facilitated or impeded their ability to instruct residents in them.

The project consisted of 26 hour-long telephone interviews with program directors from a representative, random sample of internal medicine programs.¹⁶ A board-certified internal medicine physician, familiar with residency education, conducted all interviews. Given available resources, we were unable to expand the scope of this project to include other types of residency programs, such as family medicine and surgical programs. It is likely that findings would differ among specialties.

Practice-based learning: Measuring care quality and improving medical practice

The IOM states that physicians must be able to assess the quality of care they provide and implement changes in their practice for improvement. This process is often referred to as practice-based learning and calls for physicians to obtain skills in two aspects: the methodology of quality measurement and the use of tools for implementing practice or system changes where quality is deficient (Ogrine et al. 2003). Systematic data collection and the use of chronic disease registries provide educational and experiential opportunities for obtaining experience in quality measurement. The American Board

The Accreditation Council for Graduate Medical Education (ACGME) common program requirements: General competencies

Approved by the ACGME Board February 13, 2007

ACGME competencies

The program must integrate the following ACGME competencies into the curriculum:

Patient care

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

Medical knowledge

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences as well as the application of this knowledge to patient care.

Practice-based learning and improvement

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and lifelong learning. Residents are expected to develop skills and habits to be able to meet the following goals:

- identify strengths, deficiencies, and limits in one's knowledge and expertise.

- set learning and improvement goals.
- identify and perform appropriate learning activities.
- systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement.
- incorporate formative evaluation feedback into daily practice.
- locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.
- use information technology to optimize learning.
- participate in the education of patients, families, students, residents, and other health professionals.

Interpersonal and communication skills

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to:

- communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds.

(continued next page)

of Internal Medicine offers a web-based learning module on collecting patient data and implementing practice changes. Experience with tools such as evidence-based medicine and clinical decision aids are geared toward improving practice and systems.

The RAND researchers found that, while many residency programs provide some exposure to quality assurance and system change, only a small share require residents to complete their own systematic data collection, analysis, and resulting system change (Table 1-3, p. 22). Fewer than half the programs (11 of 26 programs) have lectures or

computer-based training on quality assurance, but more (18 programs) require that residents work on quality assessment at the hospital. Fewer than a third (seven programs) have established curricula in which residents collect and analyze data on their own patients. The same share of programs introduces residents to chronic disease registries and provides lectures or computer-based training on implementing system change. Fewer still (four programs) have residents work directly on projects to implement system changes.

The Accreditation Council for Graduate Medical Education (ACGME) common program requirements: General competencies (cont.)

- communicate effectively with physicians, other health professionals, and health-related agencies.
- work effectively as a member or leader of a health care team or other professional group.
- act in a consultative role to other physicians and health professionals.
- maintain comprehensive, timely, and legible medical records, if applicable.

Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

- compassion, integrity, and respect for others;
- responsiveness to patient needs that supersedes self-interest;
- respect for patient privacy and autonomy;
- accountability to patients, society, and the profession; and
- sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Systems-based practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

- work effectively in various health care delivery settings and systems relevant to their clinical specialty.
- coordinate patient care within the health care system relevant to their clinical specialty.
- incorporate considerations of cost awareness and risk–benefit analysis in patient or population-based care as appropriate.
- advocate for quality patient care and optimal patient care systems.
- work in interprofessional teams to enhance patient safety and improve patient care quality.
- participate in identifying system errors and implementing potential systems solutions. ■

Source: ACGME

Among the programs in the study that seem to devote more resident time to quality measurement and practice improvement, one includes requiring these activities throughout an ambulatory rotation that spans several months. In some programs, a hospital's quality management department co-leads efforts in these curricula.

Overall, program directors reported that their residents' instruction in evidence-based medicine is stronger. The most frequent instruction methods in this topic are formal sessions on how to search and conduct literature reviews and journal article discussions. Half the programs provide

residents with faculty mentoring or assistance from an epidemiologist or statistician for literature analysis. Most program directors reported that evidence-based medicine is also taught informally through daily interactions with faculty in the course of patient care. While most programs reported teaching their residents to use clinical prediction rules (e.g., pneumonia severity index), only a little more than one-third (nine programs) have information technology to support these tools in clinical practice. In some cases, however, residents have the technology on their personal hand-held computers.

**TABLE
1-3**

Residency instruction in measuring quality and improving medical practice

Topic/activity	Number of programs (of 26) that include topic in curricula
QA and improvement	
Have lectures/computer-based training in QA	11
Hospital administration collects, analyzes, and presents data to residents on quality measures	9
Each resident works on quality assessment	18
Residents collect or are provided data on own patients	7
Use chronic disease registries	7
Have lectures/computer-based training in system change implementation	7
Each resident does project implementing system change	4
EBM	
Formal session—searching literature	18
Journal club/EBM conference	26
Lectures on critiquing literature	13
EBM assignments	8
Clinical decision aids	
Use order sets or critical pathways	18
Formal lectures on clinical prediction tools	6
IT supports clinical prediction tools	9

Note: QA (quality assurance), EBM (evidence-based medicine), IT (information technology). Table presents presence but not intensity level of the activity.

Source: Cordasco et al. 2009.

System-based practice: Care coordination, cost awareness, and patient safety

Individual physicians work within a complex arrangement of health care delivery in the United States. This complexity has led to fragmentation in care along the continuum of health care services (within a hospitalization, at hospital discharge, and in outpatient care). Moreover, discontinuity has likely contributed to the increase in hospitalizations that researchers have found are related to exacerbations or complications of chronic conditions (Wolff et al. 2002). To counter this trend and the unsustainable growth in health care spending, experts

have introduced system-based practice, which calls for a better understanding of the components and costs of health care delivery to improve coordination, spending, and safety (Berwick 1996). Under this concept, physicians—regardless of their practice setting—must be able to coordinate plans of care, work with multidisciplinary professionals, and utilize systems ensuring patient safety (Shortell et al. 2000).

RAND researchers found that formal instruction on many aspects of system-based practice is limited or nonexistent, particularly in the outpatient setting (Table 1-4). For the inpatient setting, program directors stated that coordinating provider handoffs of patients has recently become an area of increased attention in residency programs. Many programs (14 programs) have specific instruction in handoffs and some (6 programs) have supervision in “sign-out” procedures to communicate inpatient status during the residents’ shift changes. For coordinating care across hospital discharge, the experience is less formalized, with fewer than half (11 programs) having formal instruction on this activity. Among those that do, case managers often lead the instruction. One program reported that residents rotate through a special “discharge team” that takes the lead on care coordination and patient education on the day of discharge. Compared with the inpatient setting, formal care coordination instruction for the outpatient setting is even less common. Fewer than one-third (eight programs) reported that their residents receive specific instruction or attend conferences on care coordination in the outpatient setting.

Similarly, formal experience working in multidisciplinary teams (often composed of physicians, nurses, social workers, nutritionists, and pharmacists) is more common in the inpatient setting than in the outpatient setting. Of the 19 programs with formal inpatient multidisciplinary team experience, most are on subspecialty rotations; only 4 programs include formal multidisciplinary teamwork during the general medicine service rotation. Fewer than one-third (eight programs) reported formal multidisciplinary experience in the outpatient setting, but directors from these programs often noted that residents may engage in semiformal or informal multidisciplinary teamwork or have multidisciplinary staff available for consultation.

Only about one-quarter (six programs) have formal methods for teaching about absolute and relative costs of diagnostic tests, treatments, and medications. Most program directors indicated that they rely on informal instruction for this topic. Among those that have formal

instruction, directors mentioned topics such as hospital service costs, billing, and coding. Programs are similarly unlikely to instruct residents about patients' share of medical charges. Among those that do, the focus is typically during ambulatory experiences, such as in a clinic that uses sliding-scale policies. Directors did not mention having formal instruction about overall spending on health care in their residency programs, but the study did not ask about it specifically.¹⁷

All programs include some formal instruction in patient safety issues (e.g., preventing falls, proper patient identification). However, only about one-quarter (six programs) teach basic safety design principles, as recommended by the IOM. These principles include methods such as standardization of practices and analysis of the root causes of safety problems. Some (four programs) require residents to be involved in safety-related projects that examine causes of adverse or “near miss” events within the hospital.

Interpersonal communication

The quality of communication between patients and their physicians is important, as aspects of care such as adherence to treatment regimens and satisfaction with care plans can influence patients' health outcomes (Lorig et al. 2001, Stewart et al. 2000). Thus, to maximize health care effectiveness, it is essential for physicians to communicate collaboratively with patients and their families as well as with other health professionals to determine appropriate diagnostic and treatment regimens. Instruction in this area should teach new physicians how to communicate with patients and families in ways that are adaptable to patient age, culture, health literacy, and health status. Communication skills are particularly important when treating patients with chronic illnesses because self-management of chronic diseases relies on patients' and caregivers' clear understanding of symptoms and treatment. Previous Commission work has highlighted the importance of physician communication with patients about end-of-life treatment choices and decisions (MedPAC 2008).

The RAND researchers in this study found that, although only a little more than half the programs (15 programs) cover communication skills between health care providers, more, but not all (22 programs), include formal instruction on how to communicate clearly with patients about diagnoses and treatment plans (Table 1-5, p. 24). Looking specifically at forms of patient–physician communication, we see that communication activities that include more

**TABLE
1-4**

Residency instruction in care coordination, cost awareness, and safety

Topic/activity	Number of programs (of 26) that include topic in curricula
Coordination of care	
Formal instruction in inpatient provider hand-offs	14
Faculty/chief resident supervise sign-outs	6
IT support (computer-based tool) for sign-outs	10
Formal instruction in hospital discharge coordination	11
IT supports hospital discharge	14
Formal instruction in outpatient coordination	8
IT supports outpatient coordination	11
Multidisciplinary teams	
Formal inpatient teams	19
Formal teams on general medical inpatient service	4
Formal outpatient teams	8
Awareness of absolute and relative costs	
Lectures on costs/cost-effectiveness	6
Lectures on patient share of costs	6
Patient safety issues/methods	
Formal instruction in patient safety issues	26
Formal instruction on safety design principles	6
Patient safety project	4

Note: IT (information technology). Table identifies presence but not intensity level of the activity. Programs without formal multidisciplinary training may have semiformal or informal experiences.

Source: Cordasco et al. 2009.

patient engagement are less frequently included in formal residency instruction. For example, half the programs (13 programs) instruct residents on how to conduct shared decision making, only 10 formally instruct residents on how to counsel patients on regimen adherence and behavior change, and fewer than one-third (8 programs) ensure resident experience with the techniques of patient education, such as those used for the management of chronic disease (e.g., diabetes education classes).

**TABLE
1-5****Residency instruction in interpersonal communication**

Topic/activity	Number of programs (of 26) that include topic in curricula
Communication skills with health care providers	15
Communicating clearly with patients about diagnosis and treatment plan	22
Engaging patients in shared decision making	13
Patient education techniques	8
Counseling in adherence/behavior change	10
Cultural competency	24
Using interpreters	7
Health literacy	13
End-of-life communications	22
Holding family meetings on end-of-life issues	7

Note: Table identifies presence of formal training sessions about the topic but not intensity level of the communication activity. Programs without formal sessions may rely on informal instruction during patient care experiences.

Source: Cordasco et al. 2009.

With respect to instruction on communication with special populations or in special situations, most residency programs (24 programs) indicated that they have formal sessions on cultural competency, but only a little more than a quarter (7 programs) specifically teach skills for working with an interpreter. Half (13 programs) provide instruction on adapting communication based on patients' health literacy. In most programs (22 programs), directors reported that residents receive formal instruction on how to communicate end-of-life issues, such as advance directives, with patients and caregivers. Only seven programs formally instruct residents on how to hold family meetings to discuss end-of-life issues.

Use of health information technology

The use of information technology (IT) is a critical component of improving the quality, safety, and efficiency of health care delivery (MedPAC 2005). To make such improvements, physicians must become adept with the tools of infomatics, such as electronic medical records, computer order entry, electronic sources of medical care

information and guidelines, and IT-supported clinical decision-making aids (Gorman et al. 2000, IOM 2003).

In recent legislation, the Congress included substantial financial incentives (totaling up to almost \$37 billion from Medicare and Medicaid over the next 10 years) for hospitals and physicians to adopt health IT. To qualify for these incentive payments, providers must prove that their health IT is certified and that it is put to "meaningful use." Through the federal rule-making process, the Secretary of Health and Human Services will define the certification process and the term "meaningful use." To maximize federal (Medicare and Medicaid) investment in these IT incentives, it will be essential to ensure that participating hospitals and physicians commit to using the technology for improving the quality, efficiency, and safety of care. The Commission has recommended that performance incentives be based on the results gained through IT use, rather than simply the possession of health IT. Other key features for the success of health IT will be interoperability and standardization. Interoperability will facilitate the transfer of data and other communications across providers and settings. Standardization among technologies will allow professionals to know how to use health IT when they switch between settings. Even if health IT is standardized and interoperable, health care providers will still need to redesign some elements of their practice to take full advantage of this important technology.

In our study, the RAND researchers found that, although all interviewed programs provide residents with some exposure to electronic medical records (EMRs), in most programs, the EMRs are not comprehensive and lack one or more important components, such as the ability to enter orders or patient progress notes (Table 1-6). Only 1 of the 26 programs uses a comprehensive EMR in both inpatient and outpatient settings (not shown). Because the VA hospitals and clinics are equipped with comprehensive EMRs, residents who rotate through VA facilities gain some experience with high-functioning EMRs. Five programs reported that none of their residents' outpatient experiences includes the use of EMRs. The remaining programs include either comprehensive or partial EMR experience in the outpatient setting. As shown previously in Table 1-3, residency experience in using health IT to support other clinical functions (e.g., decision support and outpatient coordination) is limited.

Residency experience in nonhospital settings

Hospital inpatient experience is an important component of residency education to gain exposure to acute, serious

**TABLE
1-6**

Residency exposure to information technology

Setting and IT capability	Number of programs (of 26) that include IT capability in curricula
Inpatient	
Comprehensive EMR	4
Partial EMR	22
Computer order entry	11
Outpatient	
Comprehensive EMR	7
Partial EMR	14
Computer order entry	8

Note: IT (information technology), EMR (electronic medical record). Table identifies the presence but not the intensity level of the instruction in IT-related activities. Programs without formal sessions may rely on informal instruction during patient care experiences.

Source: Cordasco et al. 2009.

illnesses, but it is equally essential for residents to have adequate experience in nonhospital settings. As has been documented over decades, most health care is provided in settings other than acute care hospitals (Green et al. 2001, White et al. 1961). Therefore, residents should receive sufficient education and training in nonhospital settings. Also, to coordinate care for patients across settings, residents need exposure to and experience in a variety of health care settings (COGME 1999, IOM 2003).

The RAND researchers found that the share of residents' time working in community-based medicine or in ambulatory settings with patients in managed care is extremely limited, even though most programs (21 programs) include at least some community clinic or private practice experiences in their residency. For most of these programs, directors reported that nonhospital experiences account for only a small amount of physicians' total residencies. About half the programs require residents to perform home visits and many require a rotation in which the residents provide care in a nursing home or rehabilitation unit (Table 1-7). Many directors reported that their residents have some experience with ambulatory patient populations in managed care, but in several of them, managed care patients were only a small share of the residents' caseloads. No directors reported that their residents have experience in a medical practice designated as a "medical home" by insurers or accrediting organizations; however, several directors indicated that

their clinics are either working toward achieving this designation or have many of the features of one.

Teaching hospitals face considerable financial incentives and regulatory barriers that discourage them from rotating residents to nonhospital settings. We discuss these issues, as well as the impacts of residents' limited nonhospital experience, in a later section of this chapter.

Factors affecting programs' instruction in selected topics

During their interviews, residency program directors reported to the RAND researchers that multiple factors affect their ability to instruct in selected topics on practice-based learning, system-based practice, and interpersonal communication. These factors include IT infrastructure, faculty expertise and time, institutional support, the program's setting, residents' baseline characteristics, and relative lack of research-based evidence on the best methods for instructing residents on these skills.

The presence or absence of IT was the factor cited most often that either facilitated or impeded instruction in topics essential for delivery system reform. Directors stated that a comprehensive EMR system at residency sites was not only key for helping residents gain competence in using EMRs but was also helpful in teaching other skills. For example, EMRs provide data sources for quality improvement projects, tools for reinforcing the

**TABLE
1-7**

Residency experience in selected nonhospital settings

Setting	Number of programs (of 26) that include at least some experience in nonhospital setting
Community clinic or private practice	21
Home visits	14
Nursing homes or rehabilitation centers	21
Ambulatory care, managed care patients	20
Palliative care/hospice*	18

Note: Table presents ever/never experience in the setting but does not present information on the total time in the setting.

*Training in palliative care and hospice can occur in the hospital or nonhospital setting.

Source: Cordasco et al. 2009.

use of clinical decision support, methods to coordinate patient care between inpatient and outpatient settings, links to patient education materials, and, in some cases, comparative-effectiveness and cost information. We discussed opportunities and challenges related to health IT investments in a previous section of this chapter.

In the interviews, residency program directors stated that the levels of faculty expertise and institutional support (i.e., support from the sponsoring hospital) were key determinants of the quality and quantity of teaching in topics associated with delivery system reform. Directors often attributed the success of a given curriculum to a “faculty champion” who spearheaded its development and implementation. Alternatively, where curricula were lacking, directors cited weaker faculty members, among other contributing factors. They also noted that the attending physicians’ clinical productivity requirements for the hospital can sometimes supersede the educational needs of the residency program. Competing with the hospital for the residents’ time was frequently cited as a major barrier to teaching on topics relevant to delivery system reform, such as care coordination across settings. In contrast, programs with stronger institutional support for the residency programs—such as the availability of comprehensive health IT—appeared to have more ability to instruct on the topics we examined. Overall, directors viewed program accreditation requirements as being crucial for obtaining institutional support for their curriculum needs.

In discussion about facilitators and barriers, directors again raised the issue of care settings, indicating that opportunities and barriers may rest in the environment of the sponsoring hospital and community. For example, some programs serve a diverse patient population, but others do not. Some programs rely on rotations in community-based clinics that provide more experience with ambulatory care for lower income individuals, but placement in this type of setting was relatively rare.

Program directors also cited the level of residents’ incoming knowledge from medical school as a factor in program strength. Directors generally indicated that physicians entered their residency with little experience in quality improvement methods but relatively stronger experience in evidence-based medicine skills. The variation in residents’ skill levels in interpersonal communication was also cited as a major factor, particularly for international medical graduates. Directors also noted that residents’ general lack of interest in these

topics is a barrier, particularly because they are not a focus on board certification exams.

Finally, program directors reported a dearth of proven educational methods or tools available for teaching residents competencies in topics such as care coordination. Directors noted that it is difficult to determine the appropriate mix of formal and informal instruction methods because tools for evaluating their effectiveness are limited.

Study limitations

This study presents a snapshot of the current activities and methods that internal medicine residency programs are using to instruct in topics important for reforming the U.S. health care delivery system. It does not provide a comprehensive analysis of each topic’s educational methods because each topic could be the subject of its own study. Note that the absence or presence of teaching in a specific area is only a crude measure and does not represent curriculum quality, intensity, or effectiveness. Although our sample included only 26 of 381 (7 percent) internal medicine programs, the sampling frame was designed to produce a representative sample of internal medicine programs. In other specialties, it is likely that results would differ.

Financial incentives and regulatory barriers discourage nonhospital residency rotations

In keeping with historical patterns of graduate medical education, residency programs are largely based in inpatient, acute care teaching hospitals. Although this setting provides residents with important and crucial experience diagnosing and treating a variety of seriously ill patients, it is equally important for most residents to have adequate experience in nonhospital settings for a number of reasons.

First, as changes in health care have evolved, most of the medical conditions that practicing physicians confront are, and should be, managed in nonhospital settings, such as offices, nursing facilities, and patient homes. Thus, residents’ education and training should include settings that will give them sufficient experience diagnosing and treating common medical problems and chronic conditions. Some research has found, for example, that

internal medicine residents reported that they did not perform many common ambulatory procedures frequently enough (if at all) during their residencies and were, thus, not confident in performing them (Wickstrom et al. 2000). In other studies, family medicine residents were more likely to report feeling prepared for treating outpatients, whereas internal medicine residents were more likely to report feeling prepared to treat inpatients (Wiest et al. 2002). It is important for residents to be prepared to practice independently in nonhospital and outpatient settings because the complexity of patients and their care in these settings has grown.

Second, to understand how to coordinate care for patients across settings, residents need exposure to and experience in a variety of health care settings (COGME 2007, IOM 2004b). Third, improving residents' comfort level with care in these settings not only positively influences residents' skills in community-based care but could also increase their desire to practice community-based care—an essential component of a delivery system designed to prevent patients from being unnecessarily hospitalized. Taken together, these three reasons strongly suggest that enhancing residents' skills in nonhospital settings is important for patient health, patient comfort, and health care spending.

Currently, the relatively large share of residency time spent in hospital settings can be attributed to historical patterns of medical education, financial incentives, and regulatory issues. These factors encourage teaching hospitals to keep residents in the hospital and discourage hospitals from developing nonhospital rotations for their residents. We focus on the regulatory issues and the financial incentives in this section of the chapter.

Residents provide clinical labor in hospitals

For hospitals, residents provide valuable clinical services, particularly on-call duties that may include writing timely prescription orders and conducting patient admissions. Hiring or contracting other physicians, physician assistants, or nurse practitioners to provide these activities and services is more expensive for the hospital because hospitals must pay them higher wages (Rich et al. 2002). Moreover, Medicare does not subsidize the salaries and fringe benefits paid to these other health professionals, as it does for residents.

This labor cost incentive has been a longstanding constraint on hospitals' willingness to reduce residents'

TABLE 1-8

Medicare supports didactic (nonpatient care) instruction in the hospital setting only

Site of residency instruction	Payment to teaching hospital	
	Direct GME	IME
Teaching hospital	All approved educational activities: <ul style="list-style-type: none"> • Patient care activities • Didactic instruction (e.g., interdisciplinary grand rounds) • Research 	Patient care activities
Nonhospital setting*	Patient care activities	Patient care activities

Note: GME (graduate medical education), IME (indirect medical education).
*Teaching hospitals must have a written agreement or other documents in place demonstrating that they are incurring the costs of residents' salary and benefits and all or substantially all of the nonhospital setting's supervisory activities.

Source: Adapted from Association of American Medical Colleges 2008d.

time in the inpatient setting, cited by many experts including the Commonwealth Fund Task Force on Academic Health Centers, the IOM Committee on the Roles of Academic Health Centers in the 21st Century, the Council on Graduate Medical Education, and the Blue Ridge Academic Health Group (Ludmerer and Johns 2005). Recent reductions in the limits on residents' total duty hours have intensified this incentive because hospitals have fewer hours per resident available.¹⁸

Medicare supports didactic (nonpatient care) instruction in the hospital setting only

Medicare's support for graduate medical education draws some distinctions regarding both the type of instructional experience and the setting (Table 1-8).

- IME payments are limited to activities that are specific to individual patient care. Thus, IME payments do not cover residents' time spent on research and didactic activities (e.g., a meeting or a lecture) that are unrelated to the care of residents' specific patients—regardless of the setting. Teaching hospitals can continue to receive IME payments for residents performing patient care activities in nonhospital settings.

- Direct GME can cover time related to residents’ research and didactic (nonpatient care) learning experiences, but only when these experiences take place within the teaching hospital. Therefore, didactic activities that take place in nonhospital settings (e.g., meetings on overall practice management in physician offices) do not qualify for Medicare’s direct GME payments.

Under these regulations, therefore, for each resident who rotates to a nonhospital setting, the teaching hospital effectively loses the resident’s direct GME payment proportional to the time the resident spends in didactic (nonpatient care) activities. The teaching hospital also would not qualify for IME payments for these didactic activities, but that is true regardless of the setting.

To enforce this policy, teaching hospitals must track and characterize all their residents’ hours as either patient care or otherwise at various sites and submit the information to Medicare in a log, which may be audited. The ACGME also requires this information to review completion of specialty requirements.

Additional Medicare statute and regulations require that teaching hospitals incur “all or substantially all” of the costs borne by nonhospital settings for teaching residents, including the cost of supervision. Thus, teaching hospitals must incur the costs of research and supervised didactic (nonpatient care) activities that occur in nonhospital settings. However, teaching hospitals do not receive direct GME payments for these non-patient-care activities when they occur outside the hospital. Consequently, under Medicare regulations, teaching hospitals must pay for the cost of research and didactic activities performed in nonhospital settings, when they are expressly excluded from Medicare’s medical education subsidy.

Medicare regulates specific provisions of hospital–nonhospital residency arrangements

If teaching hospitals do not show Medicare that they are incurring all or substantially all of the nonhospital’s costs related to resident teaching and supervision, they forgo direct GME and IME payments proportional to the time residents spend outside the hospital. Although some in nonhospital settings may welcome this compensation for their time, others would prefer to volunteer their time and are not willing to complete the paperwork that teaching hospitals need to comply with Medicare regulations. This

paperwork includes a written agreement stating that the teaching hospital will incur the costs of the residents’ salaries and fringe benefits in addition to the portion of the teaching physicians’ salaries and fringe benefits attributable to resident instruction and supervision.¹⁹ To fulfill these regulations, CMS would also accept written documentation proving such payments were made, in lieu of a formal written agreement.

Calculating the cost of this supervisory activity can be complex, and physician organizations, such as the American Association of Family Physicians, report that although CMS has taken some steps to reduce this paperwork burden, it is still cumbersome and many supervising physicians would prefer to volunteer their time.²⁰ Attending physicians enjoy mentoring new physicians, view it as a professional responsibility, and may often gain stature by being listed as “adjunct faculty” at the affiliated teaching institution. In addition, depending on the skills of the resident, nonhospital sites may gain in productivity with residents’ patient care activities.

Without these written agreements or other documentation on the hospital’s responsibility to incur all or substantially all of the costs of a resident’s training in a nonhospital site, the teaching hospital effectively loses Medicare’s graduate medical education payments for that resident’s time in the nonhospital setting. With some exceptions, nonhospital settings are not permitted to receive direct GME and IME payments directly from Medicare.²¹ Some have called for graduate medical education funding to go directly to more types of nonhospital entities responsible for providing the medical instruction and resident learning experiences (AAFP 2009, Mullan 2009, Rich et al. 2002).

As stated earlier, teaching hospitals that meet the regulations for claiming nonhospital resident time not only receive direct GME but also continue to receive IME payments for the time residents rotate in nonhospital settings, provided they are performing patient care (Table 1-7, p. 25). This allowance was instituted in the Balanced Budget Act of 1997 to ameliorate the financial disincentives for teaching hospitals to rotate residents into nonhospital settings to gain community-based experiences. However, other, perhaps greater, financial incentives—such as retaining the (often lower cost) clinical labor that residents provide—continue to override this objective.

Impacts of hospital focus on residency experience

Inpatient hospital experience provides residents with important exposure to serious illnesses, but it must be balanced with sufficient experience in nonhospital and community-based settings. For most specialties, learning how to successfully manage a patient's medical conditions outside the hospital is important for patient health, patient comfort, and Medicare spending. Yet, inherent financial incentives and payment regulations discourage teaching hospitals from establishing strong offsite affiliations and, in limiting residents' experiences, may ultimately affect residents' specialty and setting choice for their future medical practice. The Commission has raised concerns about the decline in the number of U.S. medical school graduates selecting primary care and geriatrics, and the growth in the number of internal medicine physicians deciding to subspecialize or become hospitalists. These trends likely contribute to a reduction in the number of physicians who continue to treat their patients when they enter nursing homes (Levy et al. 2005).

While accreditation organizations require at least some education and training in ambulatory care settings for many specialties, Medicare's subsidies for graduate medical education place no requirements on nonhospital experience. In the case of internal medicine, for example, ACGME requires that at least one-third of internal medicine residents' time must be in ambulatory sites. In many cases, residency programs fulfill this ambulatory requirement by rotating the residents to the teaching hospitals' own outpatient departments, clinics, and physician offices. These ambulatory rotations, which occur in hospital-owned facilities, do not place hospitals' graduate medical education payments at risk. However, the teaching hospitals' loss of residency time and labor remains a factor, potentially prompting the ambulatory care requirements instituted by accrediting organizations and specialty boards.

Work for future exploration

Medical education plays a key role in shaping new physicians' attitudes and skills with respect to health care delivery reforms. Accordingly, the Commission looks forward to more detailed discussions about possible reforms to the medical education process. In addition to further examination of ways to encourage more educational

experience in nonhospital settings, we will focus our future analysis on three main areas, as outlined below.

Linking medical education incentives with delivery system reforms

Linking Medicare's medical education subsidies to specific delivery system reforms could improve residents' education and training. This strategy is based on the premise that residents and other health professionals will be more likely to learn "best practices" when they are learning within a delivery system that is integrated, coordinated, high quality, and focused on the efficient provision of care. Medical education incentives could include, for example, higher subsidies to entities with infrastructure that facilitates high-quality efficient care, such as integrated care and communication among providers across different types of health care settings. The main objective in linking medical education subsidies to delivery system reforms would be to shift more payments to the hospitals and residency programs that emphasize superior quality and judicious resource use and away from those structured more heavily on long-established, volume-based incentives.

Another focus could be on selected payment reforms that concentrate on managing the quality and efficiency of care across providers and settings. For example, hospitals and physician offices that accept bundled payments for all Part A and Part B services in a given episode of care could receive higher medical education subsidies. Curricula that specialize in delivery system reforms, such as care-coordination techniques and cost awareness, could also be recognized. Also, because faculty expertise is an influential factor in residency program curricula, efforts to encourage programs and institutions to educate existing core faculty—as well as recruit other faculty with selected expertise in such topics as quality measurement and improvement—could be effective. Other curricular incentives could include basic instruction in geriatric care across all specialties. The Commission recognizes, however, that resident education and interest are strongly influenced by the content and format of board certification exams.

Structuring medical education subsidies to produce the professionals we need

The Commission will also examine ways for medical education subsidies to help generate a balance of advanced health care professionals that efficiently meets the needs of Medicare patients and the U.S. population at large. Among physicians, nurses, and physician assistants, it

is important to achieve the right share of generalists and subspecialists. Although the exact balance may evolve over time, the Commission is particularly concerned about access to health professionals who provide primary care, such as those focusing on family, internal, geriatric, and pediatric medicine. These professionals and other generalists, such as general surgeons, are essential for a well-functioning health care delivery system. Thus, if medical education subsidies were to more strongly favor programs that educate and train generalists, then teaching institutions (e.g., teaching hospitals) may be more inclined to invest in these programs. Nevertheless, the influence of reimbursement differentials for primary care and procedural services and widely known income disparities between these specialties present a major hurdle for recruiting residents into generalist specialties.

We will also explore other ways to recruit health professionals, including physicians, nurse practitioners, and physician assistants, who can most effectively help reform our health care delivery system. For example, loan forgiveness policies may help to attract students from diverse economic, ethnic, and geographic backgrounds. Increased support for advanced nursing education and training programs could focus attention on these key team members for improving the coordination of care. Considering Medicare's subsidy of approximately \$100,000 per resident per year, Medicare could require practicing physicians to conduct some minimal public service in exchange for this support. For example, they could be required to provide occasional on-call services at hospitals or in other settings after their residency. Such a requirement would necessitate long-term contractual agreements from the resident, and some contend that this process could be complicated and that physicians should not be expected to donate their time simply because the

government made some investments on their behalf. Having an adequate panel of local physicians on call is a crucial component of the nation's access to health care, yet, in recent years, fewer physicians are agreeing to take call (CHCF 2005).

Enlisting other payers to contribute explicitly to medical education

Currently Medicare, Medicaid, and other federal programs are the largest funders of graduate medical education. Although a small number of states require private insurers to contribute toward this endeavor, most do not. Some private insurers report that they support graduate medical education indirectly through higher patient care payments to teaching-affiliated health care providers. Considering the shared, societal benefits of high-quality medical education, the Commission will analyze options for all insurers to contribute explicitly to the costs of educating our nation's medical professionals.

With additional sources of funding for medical education, several researchers have discussed the role of an independent board in making decisions about allocating medical education subsidies (COGME 2007, IOM 1997, Pew Center for Health Professions 1998, Whitcomb 2007). A goal for such a board would be to ensure the equitable and efficient distribution of funds to appropriate entities that provide medical education and training across all ages. For graduate medical education, these entities could include teaching hospitals, nonhospital settings, and even residency programs. Goals guiding the distribution of these funds could stem from the objectives described previously, such as delivery system reforms and adjusting the balance of health care professionals to ensure adequate access to primary care. ■

Endnotes

- 1 There were also 11,742 applicants for 4,389 positions in osteopathic medical schools in 2008. As there is some overlap between the applicant pools, the total number of unique applicants to allopathic and osteopathic medical schools combined cannot be determined.
- 2 Osteopathic residency programs have their own match structured in a similar fashion to the NRMP match.
- 3 The binding commitment is for one year. Residents can choose to change programs after the first year of training, if they find a program willing to accept them.
- 4 Colorado, Indiana, New York, South Dakota, and Vermont have no minimum CME requirements.
- 5 Illinois, Kansas, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, North Carolina, Ohio, Pennsylvania, and Washington require an average of 50 credit hours.
- 6 The American Board of Medical Specialties on March 16, 2009, adopted a new set of standards for the MOC program that the individual specialty boards will incorporate into their MOC programs from 2010 to 2012. These new standards include self-assessment requirements, evidence of participation in practice-based assessment and quality improvement, patient safety assessment, and evaluation of communication assessment skills.
- 7 In addition to the allopathic and osteopathic accreditation, dental and podiatry programs accredited by their respective accrediting bodies also qualify.
- 8 This support totals about \$300 million and is limited to programs sponsored by the hospital, mostly diploma programs, which have been replaced by associate and baccalaureate programs sponsored by community colleges and universities, which are ineligible for Medicare support, even though some training may take place in the hospital. Title VII, administered through the Health Resources and Services Administration, also provides funding for nurse education.
- 9 Approximately 19,000 of these residents were counted as half an FTE for direct GME payments because the trainees were in either a subspecialty fellowship—having completed their initial residency—or training beyond the minimum required for initial board certification in a specialty.
- 10 With the total Medicare-supported residents and the 8,000 additional residents, in 2006 there were about 97,800 FTE residents training in Medicare-supported hospitals (91,800 in short-stay acute care hospitals). A little more than 7,000 residents were in non-inpatient prospective payment system hospitals (e.g., cancer hospitals, children’s hospitals).
- 11 Exceptions may apply for new programs established in rural hospitals, hospitals that had no residents in the base period, and urban hospitals with a new separately accredited rural training track.
- 12 Provided they are fully licensed, residents may bill Medicare for (moonlighting) services they provide that are not considered part of their residency training experience.
- 13 There is also an IME adjustment that is made to capital payment rates that is based on a different formula. Capital IME payments, which totaled about \$360 million in 2007, are scheduled to be eliminated by the Secretary in 2010. The inpatient rehabilitation facility prospective payment system (PPS), long-term care hospital PPS, and psychiatric hospital PPS also include an IME adjustment based on their own payment formulas.
- 14 The study showed that physician productivity, as measured by relative value unit output, declined when residents were present in an internal medicine practice. Relative value unit output per hour declined by 0.8 when physicians were working with first- and second-year residents and by 0.5 when working with third-year residents.
- 15 See, for example, Blue Ridge Academic Health Group 2003, Blumenthal 2002, COGME 2007, Holmboe et al. 2005, IOM 2008, IOM 2003, Ludmerer and Johns 2005, Meyers et al. 2007, Mullan 2009, Weinberger et al. 2006.
- 16 In comparison with the universe of U.S. internal medicine residency programs, the RAND researchers found that the randomly selected sample was representative on the following characteristics: number of residents, type of hospital (university, community, municipal), geographic region, and type of program accreditation (allopathic, osteopathic). Programs that had *both* allopathic and osteopathic accreditation were slightly oversampled.
- 17 In preliminary research on medical school curriculum, we found that fewer than 10 percent of medical school programs include instruction on health care costs and spending as a requirement or objective in the curriculum.

- 18 Beginning July 2003, the ACGME limited residents' duty hours to an 80-hour work week, averaged over 4 weeks. In December 2008, the IOM recommended further specifications on the need for a 5-hour sleep period.
- 19 The hospital must incur at least 90 percent of the total of all the nonhospitals' associated training costs. CMS does not consider resident salaries and fringe benefits to equal "all or substantially all of the costs of the training program in the nonhospital setting." Prior to 1998, Medicare accepted resident salaries and fringe benefits as meeting this requirement in full.
- 20 Effective July 1, 2007, in determining the teaching physician supervisory cost, hospitals may also use national average salary data in place of actual teaching physician salary information and may also use a proxy percentage representing the amount of time the teaching physician spends supervising the residents.
- 21 The exceptions are Federally Qualified Health Centers, Rural Health Clinics, and Medicare+Choice organizations. These entities became eligible to receive direct GME and IME from Medicare through the Balanced Budget Act of 1997.

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