

It's Time to Address the Problem of Physician Shortages

Graduate Medical Education is the Key

Richard A. Cooper, MD

It is now widely accepted that the United States is on the cusp of deepening shortages of physicians.^{1,2} This article will briefly review how these shortages could have been anticipated, how they are being manifested, and how policy-makers were drawn to the contrary conclusion, and it will discuss the challenges that now exist as the nation undertakes to expand undergraduate and graduate medical education in an attempt to meet the projected future demand.

SETTING THE STAGE FOR FUTURE SHORTAGES

Anticipating the Demand for Physicians

As physicians, it is natural to think about the future demand for physicians in terms of needs, such as the aging population and the obesity epidemic, or new technologies, such as implantable defibrillators and targeted therapeutics. During the 1990s, many thought that payment systems would drive the need for more primary care physicians. But none of these has proven to be decisive. Rather, the dominant factor that my colleagues and I have observed is growth in the economy overall, because ultimately it is the capacity of a society to purchase health care that determines how many services will be used.³

From 1929 to 2000, the growth in physician supply followed the trend of economic growth rather closely, except in the period after World War II, when the economy grew briskly but the production of physicians lagged behind. In response, medical school capacity doubled, and so did the capacity of residency programs (Fig. 1). By 1980, physician supply had increased to the level that could be predicted from per capita gross domestic product, and it roughly paralleled gross domestic product growth over the next 2 decades. Figure 2 displays this trend and extrapolates the demand for physicians to the year 2025.

Downward Pressure on Supply—Medical Schools

As the supply of physicians began to build in the 1970s, and as health care spending increased, policy-makers feared

that too much spending on health care would harm the economy, and many reasoned that it was physicians who drove spending. Therefore, freezing their numbers would be beneficial. Others were alarmed by the fact that, in per capita terms, the growth in physician supply was entirely due to additional specialists, while primary care held constant, thereby tipping the ratio, a process that must be rectified. These 2 philosophies found quantitative support in a series of workforce projections that, in retrospect, were badly designed but that gave strength to the idea that the nation would soon have too many physicians and the medical education pipeline must shut down. Federal support for medical schools abruptly ceased in 1976, and the expansion of both allopathic (MD) and osteopathic (DO) schools ground to a halt (Fig. 1). While DO schools began to grow soon thereafter, MD schools remained at 1980 levels for more than 2 decades. In per capita terms, the output of medical students declined.

Downward Pressure on Supply—Graduate Medical Education

Graduate medical education (GME) followed a different course (Fig. 1). After growing in parallel with medical school enrollment in the 1960s and 1970s, it paused briefly in the 1980s but then continued its upward path in the 1990s. However, this latter period was not associated with additional US medical graduates but with more international medical graduates (IMGs), some of whom were US citizens but most of whom were foreign nationals. Indeed, by the late 1990s, IMGs accounted for approximately 25% of first year (PGY-1) residents.

Looking back over the 35 years from 1960 through the mid-1990s, one can discern an overall upward trend of 350 to 400 additional PGY-1 positions annually. This trend did not escape the notice of planners, most of whom held to the notion that there were too many specialists being trained, and in 1996 a "Consensus Statement" was developed by a coalition of the American Medical Association (AMA), Association of American Medical colleges (AAMC), Association of Academic Health Centers (AAHC), American Osteopathic Association (AOA), American Association of Colleges of Osteopathic Medicine (AACOM), and National Medical Association (NMA).⁴ It proposed to "reduce the number of GME positions funded by the federal government to a number closer to that of the graduates of US allopathic medical schools," a proposal that found expression in the Balanced Budget Act of 1997, which froze federal funding for GME at

From the Leonard Davis Institute of Health Care Economics, University of Pennsylvania, Philadelphia, Pennsylvania.

Reprints: Richard A. Cooper, MD, Leonard Davis Institute of Health Care Economics, University of Pennsylvania, 3451 Walnut St., Philadelphia, PA 19104. E-mail: cooperra@wharton.upenn.edu.

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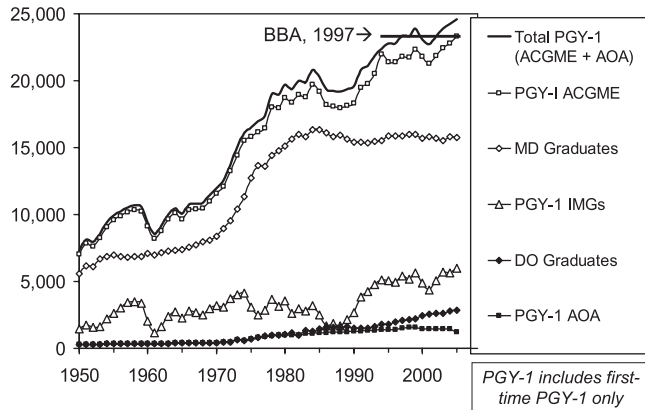


FIGURE 1. Medical graduates and PGY-1 residents without previous residency. 1950–2005.

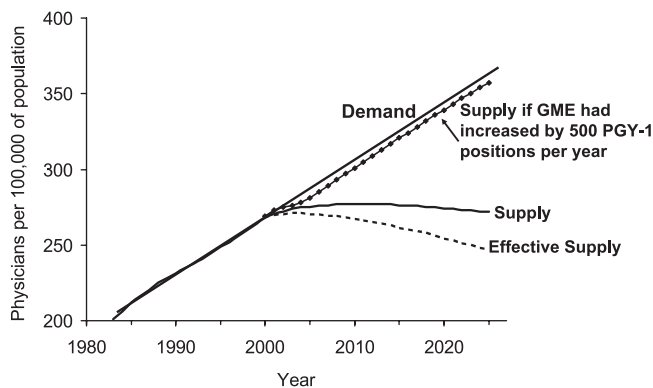


FIGURE 2. Physician supply and demand projections. Extrapolated to 2025.

its 1996 levels. This single action fully accounts for the leveling off of physician supply in 2005 and the projected decline thereafter. Indeed, had a cap not been placed on GME, the physician shortages that are developing today would not exist (Fig. 2).

Downward Trend of Physician Work Effort

A second factor affecting physician supply has to do with the decreasing work effort of physicians. One reason for this relates to aging of the workforce, as the youthful cohorts of the 1970s and 1980s mature. Another is the increased participation of women, and a third is generational—the desire of younger physicians of both genders for more family time, less time on-call and fewer hours overall. Added to this is the 80-hour rule for residents. Finally, increasing numbers of physicians are finding opportunities in health care organizations, pharmaceutical companies and other venues outside of clinical practice. It is the combination of increasing demand for physicians and a decline in their actual and effective supply that is leading to a projected short-fall of more than 200,000 physicians by 2025 (Fig. 2).

Evidence of Shortages

Although the nation is headed toward very large shortages in the future, evidence of physician shortages exists

already. One example is longer waiting times for patients, even when referred by another physician. Hospitals and group practices report increasing difficulty in recruiting physicians, not only in specialties such as urology, radiology, cardiology, gastroenterology, and oncology, which have been experiencing shortages for a number of years, but also in primary care, which is now the most frequent specialty sought by search firms. Young physicians are receiving more jobs offers, higher starting salaries, and larger signing bonuses, particularly in procedural specialties. Some group practices have found recruitment of new physicians too time consuming and expensive and have simply decided to get smaller. Night and weekend coverage is difficult to assure in many areas of the country, and hospitals find that they must compensate specialists for being available to cover emergency rooms. The quest for physicians now provides employment for 8000 recruiters.

Surveys of medical school deans confirm the tight physician labor market.⁵ Similarly, in a recent survey of hospital CEOs conducted by the Council on Physician and Nurse Supply, 45% of respondents reported that recruiting physicians is very challenging and 51% that it is more challenging than 1 year ago. Medical societies and hospital associations in 15 states, which represent more than half of the US population, have issued reports that project shortages of physicians, and 15 specialty organizations have published reports projecting national shortages in their disciplines. Most organizations that had participated in the “Consensus Statement” concerning physician surpluses a decade ago have issued statements that the nation is facing physician shortages, instead. Even the Council on Graduate Medical Education (COGME), which promulgated the notion of physician surpluses throughout the 1990s, has recanted and, based on the approach to planning that my colleagues and I described,³ has projected large shortages of physicians in the coming years.²

CHALLENGE #1: EXPANDING GRADUATE MEDICAL EDUCATION

What is needed to fill the gap? Indeed, can it be filled? With rare exceptions, the route to practice in the United States is through residency training programs approved by the Accreditation Council on Graduate Medical Education (ACGME) or AOA. Over the past decade, approximately 25,000 residents entered PGY-1 positions for the first time each year. At this rate, 750,000 physicians will be produced in the period from 1995 to 2025, which, as noted, is approximately 200,000 too few. If, instead, the number of PGY-1 positions had continued to grow after 1995 at about 500 annually, somewhat more than had been the case during the previous 3 decades, and if such growth were to continue until 2020, the total number of PGY-1 positions would reach 35,000 in 2020, 10,000 more than in 1995, and a total of 955,000 new physicians would be produced over the 30 years from 1995 to 2025, which is the number of physicians that we projected will be demanded (Fig. 1). Thus, had the natural evolution of GME been allowed to continue, the United States would not now be facing a physician shortage (Fig. 2).

I believe that it is imperative that the number of PGY-1 positions be increased progressively to a level that is 10,000 more than at present—1000 additional PGY-1 positions annually for 10 years to a total of 35,000 by 2020—a 40%-increase. Because the average duration of residency is more than 4 years, this calls for an increase of almost 45,000 residents overall. Embarking on this path raises a number of perplexing questions and presents a number of serious challenges.

Can Residency Programs Grow Fast Enough?

Expanding residency capacity will require new or expanded programs with the necessary depth of faculty, breadth of patients, and quality of education. The ACGME and the AOA apply stringent criteria in approving new residency programs or the expansion of existing ones. Even highly respected programs have had difficulty in gaining approval for expansion, and new programs can be expected to face an even more difficult and protracted course. Therefore, the pace of expansion is likely to be slow—slower than 1000 new PGY-1 positions annually.

Is There Adequate Capacity for Additional Residency Programs?

Most residencies are hospital-based. There are roughly 3700 hospitals in the United States, 1500 of which have 100 or fewer beds. Of the 2200 with >100 beds, half are already teaching hospitals, but half are not, suggesting that, at least in terms of physical capacity, there may be opportunity for the needed expansion. Even more opportunity could exist if hospitals develop relationships with outpatient sites in which training may occur, and still more would exist if Medicare permitted organizations other than hospitals to sponsor GME.

Can the Duration of Training Be Shortened?

During the 1980s, the average length of residency training increased, as leaders of various disciplines saw the need for broader experiences to match the broadened complexity of care. Now, with increasing subspecialization (almost 200 specialties recognized by the AMA), leaders are questioning whether some of the general training in medicine and surgery might be truncated and specialization be allowed to proceed earlier. One result of shortening training would be to free up training sites and training funds and to do so under the Medicare cap.

Even With Best Efforts, Can the Gap Be Closed?

As noted above, if the natural expansion of PGY-1 positions been allowed to continue unimpeded, the United States would not now be facing a physician shortage. The question is, can the current and projected shortages be corrected in the years to come? Figure 3 displays the long-term results of increasing the number of PGY-1 positions by 1000 annually over the 10 years from 2010 to 2020, bringing the total to 35,000 PGY-1 residents in 2020, a 40%-increase. Accomplishing this might seem to be a Herculean task, yet the same magnitude of increase was accomplished between 1970 and 1980. However, even if it were possible to add this large number of new residency positions, the gulf created by

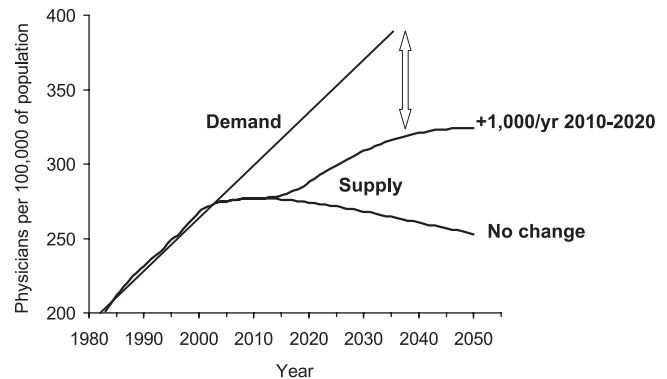


FIGURE 3. 1000 Additional PGY-1 positions annually, 2010–2020. Extrapolated to 2050.

a lack of growth in the years following 1995 could not be overcome. The gap between the supply of physicians and the projected demand would narrow somewhat, but it would not close. This does not mean that residency programs should not be expanded. Rather, it signifies the urgency in expanding them, while also encouraging the development of training programs for advanced practice nurses and others who will be needed to fill the gap.

CHALLENGE #2: FINANCING GRADUATE MEDICAL EDUCATION

Medicare Direct Medical Education Payments

Since its inception in 1965, Medicare has been the major source of funding for GME. The initial legislation stated that “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 borne to an appropriate extent by the (Medicare) hospital insurance program.” Until Diagnostic related groups (DRGs) were introduced in 1983, these direct medical education (DME) costs were reimbursed to hospitals. After 1983, they were allocated by formula separate from Medicare’s payments for clinical services. The legislative language establishing this latter mechanism stated that “the Department believes that this approach will allow for continued Federal support of medical education through the Medicare program, while clearly identifying that support as separate from patient care.”

DME payments grew progressively as the number of residents expanded, from approximately 40,000 in 1965 to 100,000 30 years later and as per resident reimbursement increased. Total DME payments peaked at \$2.9B in 1996 and declined thereafter to approximately \$2.5B annually, 0.5% of federal health care expenditures (Table 1). Of this \$2.5B, approximately \$1.0B is directly attributable to residents’ stipends, whereas the remainder covers associated educational costs.

TABLE 1. Financial Support for GME

\$2.5B Medicare DME
\$5.1B Medicare IME
\$3.0B Medicaid (state + federal) (? 1/3 DME and 2/3 IME)
\$1.1B VA + DOD
\$3.2B Private insurance (est.)
\$1.0B Practice revenues, endowment (est.)
\$15.9B Total
\$8.8B DME = approximately \$80,000 per resident
\$7.1B IME

Medicare Indirect Medical Education Expenditures

In 1982, the Tax Equity and Fiscal Responsibility Act allocated additional Medicare funds to hospitals for the increased costs of patient care in teaching hospitals. The legislative language incorporating this into the Prospective Payment System stated that this was done “in light of doubts about the ability of the DRG case classification system to fully account for factors such as severity of illness and the requirement for specialized services and the costs of teaching residents.” In the absence of better metrics, funding levels were determined according to the resident-to-bed ratio, and though only partially related to teaching, this payment stream was entitled Indirect Medical Education (IME) payments. Unlike DME payments, which are explicit, IME payments are made through an adjustment to normal clinical reimbursement.

During the 1990s, IME payments grew more rapidly than DME payments, almost doubling to \$5.5B in 1996. Since then, a number of legislatively-defined mandates have trimmed this amount to less than \$5.0B, whereas Disproportionate Share (DSH) payments have increased somewhat to cover a greater portion of uncompensated care. Further decreases in IME payments seem likely, although the rate of decrease is certain to be slowed by strong support for teaching hospitals in Congress and the concern that decreases in this payment stream could jeopardize the ability of teaching hospitals to achieve their public mission. Yet critics call for evidence that teaching hospitals do, indeed, achieve that mission.

Other Sources of DME Support

The Veterans Administration (VA) funds approximately 8800 residency positions and has made a commitment to increase this number to 10,500, and the Department of Defense (DOD) funds additional positions. The combined total expenditures for these positions are approximately \$1.1B annually (Table 1). Medicaid also supports GME, although its payments to hospitals are not directly linked to a fixed number of residents. Support from Medicaid varies among states, as does its specific purposes, but totals more than \$3.0B. Combining these sources with Medicare funding of approximately \$2.5B for DME plus \$5.0B for IME yields a total of approximately \$11.6B in governmental support. In addition, teaching hospitals fund residency training through the higher charges that many insurers are willing to pay, based on the quality and intensity of services in teaching

hospitals. Assuming that these payers contribute according to Medicare’s DME formula, this would account for an additional \$3.2B. It is estimated that as much as \$1.0B more is derived from clinical practice revenues, endowment, and other sources,⁶ bringing the total support for residency training (DME + IME) to almost \$15.8B, of which approximately \$8.8B can be thought of as DME and \$7.0B as IME.

Increasing the GME Pipeline Outside of the Caps

Despite Medicare’s GME caps, hospitals are free to add more residents, but without Medicare funding. In addition, hospitals that never had a residency program are free to begin residencies with Medicare support pegged at the complement of residents that exist after 3 years, a very short time to build a broad complement of residency programs. Rural hospitals also fall under an exception that permits them to increase their residencies by an additional 30%. The VA is, of course, outside of the Medicare reimbursement system, and the additional 1800 positions that it will support are welcomed additions, although they represent fewer than 5% of the 45,000 that are needed. Through these various means, hospitals have added approximately 1000 PGY-1 residents and 4500 residents overall during the past decade, evidence that growth is possible but that, in the current environment of caps on Medicare support, growth is very slow.

States in which new medical schools are developing face the dual challenges of too few residency *programs* in their geographic areas for the clinical training of their medical students and too few residency *positions* in their geographic areas for their graduates. To enable expansion of GME, Florida’s Senator Nelson recently introduced “The Resident Physician Shortage Reduction Act of 2007,” which would lift the Medicare cap in those states which, like Florida, have fewer residents per capita than the national average. Some other states in which medical schools are being established, such as Georgia, Arizona, and Nevada, would also qualify.

Alternative Funding Schemes

Because of tension and debates about Medicare’s funding of GME, there have been a number of proposals to change the flow of funds. One such proposal would remove DME from the Medicare entitlement program and fund it separately out of multiyear federal appropriations. Another would maintain the present Medicare GME funding but separate the streams of payment for DME and IME, with IME continuing to flow to hospitals and DME directed to the organizations that are responsible for training, usually medical schools or consortia of schools and/or training programs. A variation on this latter proposal would distribute Medicare DME directly to residents as vouchers that can be carried to any training program.

Another set off proposals would link the distribution of GME funds to particular policy objectives, such as primary care training or the training of physicians for rural and underserved areas. Incentives that address these goals already exist within Medicare GME, and many states have attached incentives for primary care to their Medicaid funding. Most have also made special appropriations for Family Practice.

However, despite such funding, these goals have not been met, and it may be better to achieve such objectives through reimbursement rather than through training policies.

Finally, a number of organizations have recommended that the responsibility to fund GME should be distributed more broadly among payers and thereby diminish the obligation of the federal government. One such proposal from the 1990s would establish a Medical Education Trust Fund to which all payers would contribute proportionately. Like Medicare, this Trust Fund could support the direct costs of training within any program approved by the ACGME or AOA. COGME endorsed this approach in its 15th Report in 2001, and as recently as June 2007, the AMA reaffirmed its support for an all-payer system. Although sensible on the surface, and functioning in New York and, to a certain extent, in Minnesota and Utah for many years, such a proposal at the national level is fraught with difficulty. For example, would both DME and IME be included? Would it temper Medicare's financial commitment? And would a single national payer exert undue influence over the distribution of funds, both geographically and by specialty?

In considering an all-payer system, it is also important to observe that all payers already contribute (Table 1). Medicare and Medicaid do so directly, as do the VA and the DOD. Private payers contribute indirectly through the higher charges levied on them by many academic health centers, and there is no way for the uninsured to contribute. Indeed, private payers already see themselves as contributing disproportionately to the costs of the uninsured through cross-subsidies, and they may recoil against greater contributions to GME. The federal government would likely argue that private insurers profit from the fact that the premiums from employer-sponsored plans are tax deductible. Such cross-currents reveal the quasi-rational approach to health care financing in the United States. Within that context, it is not surprising that a formal all-payer system for GME has not come to pass. Of particular concern is that a continued focus on an all-payer system diverts the rhetoric from the central role of Medicare in financing GME, which is embodied in federal legislation and, contrary to the intent of that legislation, has been frozen by means of an arbitrary cap. Medicare's role in GME may not be fully rational, or if rational, not fully justified, but this is the way GME financing works, and nothing should be done that reduces the obligation that Congress assigned to Medicare 40 years ago.

CHALLENGE #3: AMBIGUITY, ANTIPATHY, AND INCONSISTENCY IN GME

Confusion, Inconsistency and Fairness in Medicare GME Funding

It is difficult to contemplate expanding Medicare support for GME when there is such deep-seated ambivalence about both DME and IME. Although there are concrete reasons for some of it, the basis for much of it is that GME funding serves 2 fundamental purposes: direct service and social investment—a private and a public good. The former is measurable; the latter is elusive.

A particular problem in understanding IME payments is that their purpose has been characterized by authoritative sources in a number of different ways. As noted above, the intent of Congress was to recognize that teaching hospitals deal with greater severity of illness, offer specialized services and bear the added costs of teaching residents. The Congressional Budget Office has continued to refer to these 3 characteristics, but others have made reference to the added costs of research and the burden of uncompensated care, both of which are typical of teaching facilities.

The problem of definition is compounded by the fact that teaching hospitals vary greatly in case mix severity and technology and in the amount of teaching, research and uncompensated care. Overall, there are approximately 3700 hospitals, 1100 of which are teaching hospitals, of which 242 are “major teaching hospitals.” Although these major teaching hospitals train 75% of the residents and, in the aggregate, have the highest acuity patients and the highest proportion of DSH, they vary widely in these characteristics. In a recent analysis performed by RAND, only 35% of the 242 major teaching hospitals were also among the top 242 of hospitals for case-mix severity, and only 20% were in the top 242 with respect to DSH payments.⁶ Only 3 hospitals were in the top 242 of both severity and DSH payments. The 850 “minor teaching hospitals” had somewhat greater average severity than the 2730 nonteaching hospitals, but there was no difference in DSH. This kind of heterogeneity is a potential source of unfairness in applying the IME formula across all teaching hospitals, and it begs for some other way for society to assure that important communal goals are achieved.

A second problem in the “fairness doctrine” relates to the fact that GME reimbursement is tied to historic benchmarks, dating to 1983 for many hospitals, a fact that has led to substantial differences in reimbursement for what seem to be similar services. In the 1990s, per-resident reimbursement for DME and IME varied as much as 10-fold. In 1997, these differences were reduced for DME by setting the minimum per-resident amount of reimbursement to 70% of the national average, and this was further adjusted to 90% in 2000. Nonetheless, because Medicare GME is provided in proportion to the percentage of patients who are covered by Medicare, significant differences among hospitals persist.

Critiques of Medicare GME Funding

IME is most easily open to criticism because its rationale is most elusive. For example, Nicholson and others have argued that if teaching hospitals have sicker patients or provide more technically sophisticated care, DRGs should be adjusted accordingly.⁷ Similarly, if the care that they provide is of higher quality, that, too, should be recognized through an adjustment to reimbursement, a process that is beginning to occur through pay-for-performance. Finally, if the purpose of IME is for public goods (added costs of teaching and research and uncompensated care), there is no reason that these should be paid for through an entitlement program rather than the normal appropriations process.

Newhouse and Wilensky have offered a similar criticism for DME, arguing that residents already pay for their own education by accepting below-market salaries and that

there is no reason to treat their true salaries in a manner that differs from the salaries of other hospital employees, which are reimbursed through the normal DRG mechanism.⁸ Med-PAC, which Wilensky chaired, concurred, as have others. The employee status of residents has been acknowledged by the National Labor Relations Board, which recognizes their right to organize, and by the Social Security Administration, which excludes them from the category of students and, therefore, obliges them to contribute to FICA. Even if residents are students and the payments to them are for education, critics, such as former Representative Bill Thomas from California, argue that any federal spending for medical education should be through the appropriations process rather than an entitlement program. I have argued that residents are neither students nor employees but apprentices, a category that is not recognized by labor laws, and that the stipends that they receive through DME pay for the admixture of service and education that is inherent in apprenticeship training. Moreover, because residencies span multiple years, exposing Medicare DME payments to the vagaries of annual or even multiyear congressional appropriations rather than to a secure entitlement program has the potential to destabilize the educational process and jeopardize a national resource.⁹

Antipathy Toward Specialists

Another reason for the persistent thread of antipathy about Medicare's role in financing GME relates to the disproportionate number of specialists who have been trained, a sentiment that can be traced back to the 1920s. Robert Petersdorf gave voice to these feelings in his seminal call for action, "The Doctors Dilemma," published in 1978.¹⁰ In 1983, GME support was reduced to 50% for specialty residents who had met their initial board requirements. Yet, specialty residents continued to predominate, and in 1993 COGME adopted the "110-50/50" plan, which would have reduced the number of PGY-1 residents to 110% of the number of US medical graduates and mandated that half should be in primary care. The philosophical nature of this proposal is reflected in statements by the then Director of the Bureau of Health Professions, who characterized it as "a social judgment, not a scientific judgment," one that was directed to stemming "the conscious production of unneeded specialists by teaching hospitals that were unwilling to modify their training programs to address the needs of the country."¹¹ Although endorsed by most major health care foundations and organizations, this plan was never implemented. However, Medicare took a step in its direction by ending the annual payment updates for specialty residents while continuing them for primary care residents. At the same time, the AAMC adopted a proposal that 50% of medical school graduates should enter primary care. Despite these actions, specialist trainees still predominated, and antipathy toward specialty training continued to simmer, leading ultimately to the 1996 "Consensus Statement" by the AAMC, AMA, and others⁴ and culminating in the Balanced Budget Act of 1997, which capped the number of residents that hospitals could claim for DME reimbursement at their 1996 levels and pegged the hospital resident-to-bed ratio for calculating IME to the same benchmark. *There has never been an action*

affecting medical education that has had as broad a consensus, yet it was this single action, now repudiated by many of its signatories, that fully accounts for the physician shortages that are now being encountered.

Federal Budget Constraints

Quite apart from philosophy and policy, any attempt to rectify the situation through Congressional action will confront the budget constraints that Congress now faces at a time when the demands on Medicare seem ever-increasing. Medicare's contributions to GME come principally from Part A (the Medicare Trust Fund, which is supported through payroll deductions). Only a small portion is derived from Part B, which is supported by general revenues and beneficiary premiums. Congressional staffers remember that only a few years ago there was a consensus among medicine's leadership calling for a reduction in the number of residency positions. This experience is coupled with a large body of contemporary literature from the Dartmouth Atlas and others purporting to show that regions with more physicians experience greater costs with no accompanying improvements in outcomes or satisfaction. However, these studies simply extend what is known in the sociological literature as the "doctor-mortality paradox," a phenomenon that results from the tendency of affluent urban centers to invest in health care resources, which attract specialists, and also to serve as a magnet for the disadvantaged, whose health care costs are great but whose outcomes are poor. Once this phenomenon is recognized, regional variation is seen not as a matter of the inefficiency but as a matter of social inequality. Yet, the dual notions of surpluses and inefficiency resonate through the corridors of government.

The negative view of Congress and the administration that results is reflected not only in persistent efforts to decrease IME payments but in attacks on DME from its margins. One is a rule proposed by Center for Medicare and Medicaid Services that would exclude the time that residents spend in didactic exercises from the hospital's calculation of GME reimbursable time. After a great deal of protest, this was scaled back to exclude only those didactic exercises that encompass an entire day. A second proposed rule would have excluded support for GME from the federal portion of Medicaid. Principally through efforts of the American Hospital Association, the implementation of this rule was delayed for 1 year. These 2 examples illustrate the antipathy within Center for Medicare and Medicaid Services toward Medicare GME funding, a position that stands in stark contrast with legislative language establishing a central role for Medicare in funding the training of residents.

Preserving the Status Quo

Thus, any attempts now to remove Medicare's GME caps are inexorably linked to the ambiguity and antipathy that have become the hallmarks of Medicare DME, a program that has been immensely important in fostering medical education at a cost of approximately 1/1000 of the nation's health care budget but that, by its caps on further growth, is an obstacle to creating the necessary supply of physicians for the future. There are simply too many threads of debate, and they are

derived from too many systems of belief. Principal among these is the long-entrenched belief that the nation is training too many specialists and too few generalists. Added to this is the economists' perspective that, contrary to decades of legislative language declaring Medicare's responsibility for GME, physicians are not a public good and, even if they are, medical education should not be Medicare's responsibility. Intertwined with these is the broadly held belief that, despite the validity of their purpose, IME payments have no clear and unambiguous way to support society's interests in medical education, research and technology or to fairly compensate hospitals for case mix severity and uncompensated care.

Hovering over these nuanced details about Medicare GME is the status quo: more than \$10B flows annually from Medicare and Medicaid to 1100 teaching hospitals, among which are both "winners" and "losers." Even for hospitals that receive less than the national average, the status quo may be better than some unknown future. Expanding GME funding to more hospitals or allowing those with smaller numbers of residents to grow may entail a redistribution of existing funds, even if additional funds are appropriated.

It is no wonder that there is so much inertia in propelling GME forward. And while many specialty organizations have expressed the desire to expand GME in their discipline, the means chosen by most have been through a redistribution of existing residency positions, coupled with more effective recruitment of residents from the existing pool. Few other than the American Surgical Association (ASA) and the American College of Surgeons (ACS) have taken the position that the total size of GME must be increased. Even organizations that have advocated increasing GME have done so with muted conviction. For example, although the AMA's House of Delegates has empowered the AMA to actively seek congressional action to remove Medicare's GME caps, the AMA has not been aggressive in pursuing this matter, and while the AAMC has also called for removing the caps on GME, achieving that goal is not among its newly-framed strategic objectives. Others, particularly the health care foundations that were so active in the quest to decrease physician training, simply remain silent. There are, no doubt, many important issues that leadership organizations and foundations must confront—childhood obesity, mental health, reimbursement, research, the uninsured, and others—but there is none of greater importance to the public than having a competent and caring physician.

CHALLENGE #4: MEDICAL SCHOOLS

Although residency training is the single route to building the physician workforce, the source of residents is varied. It includes US medical graduates, both MD and DO, US citizens who were educated abroad and foreign nationals who were educated in other countries. From the mid-1970s to the mid-1980s, 80% of residents were graduates of MD schools in the United States. However, with the publication of the report of the Graduate Medical Education National Advisory Committee in 1980 and preliminary reports antecedent to it, all predicting large surpluses of physicians, a voluntary moratorium on medical school places was accepted by MD

schools (Fig. 1). But, as described above, GME continued to grow, with an influx of more F-IMGs in the early 1990s, additional DO graduates beginning in the mid-1990s and more US-IMGs by the turn-of-the-Century. Only recently have MD educators awoken to the fact that the percentage of residents who are MD graduates of US medical schools has fallen to almost 60%, while the percentages of DOs and IMGs have risen.

Increasing medical school output will not be easy. Although expanding existing medical schools is the most efficient way to do so, most existing MD schools grew in size during the 1960s and 1970s, leaving little opportunity for growth.¹² Surveys of MD medical school deans indicate that the overall expansion capacity is about 10%, or about 1500 students.⁵ Starting new schools is a long and arduous process. As of July 2007, 16 MD schools are in various phases of development, ranging from a few that will admit students in 2007 to others whose first class may not be for 5 years or more. All are small. Collectively, they are unlikely to yield more than 1000 graduates by 2012. If this occurs, MD enrollment in 2012 will be only 2500 more than in 1980, an increment of only 15% during a period in which the population grew by 30%.

DO schools have been more successful in expanding. After a brief pause in the 1980s, the 15 schools existing then added students, and another 5 schools plus 4 branch campuses opened, bringing the total to 24. Enrollment doubled from 1500 in 1980 to 3000 in 2000. With 4 additional schools being planned, enrollment is projected to reach 4500 in 2012, triple the number that enrolled in 1980.

Thus, an optimistic assessment of the growth potential of MD and DO schools suggests that their combined enrollment of 17,000 in 1980 (91% MD and 9% DO) could reach 22,500 in 2012 (80% MD and 20% DO). Although this is 5500 more than in 1980, it is only 3500 more than the class of 2000, one-third of the needed increment of 10,000 that flows from our projections of demand.

CHALLENGE #5: MEDICAL SCHOOL APPLICANTS

The final challenge concerns applicants. US college students apply to MD and DO schools in the United States and to off-shore schools. From what is known, more than 90% of DO applicants applied to an MD school and more than 60% of students who attend an off-shore school applied to an MD or DO school in the United States. Is the current applicant pool large enough to feed the necessary expansion of medical schools? My answer is, marginally so.^{13,14} Based on measures of success in MD medical schools, a ratio of first-time applicants to matriculants of 1.5:1.0 is the minimum necessary to maintain quality. That ratio is close to the current ratio, which indicates that there is very little reserve. This does not mean that there are not qualified applicants who do not gain entry. Rather, the likelihood of failure among those who did not gain admission grows as the percent of applicants who are admitted grows.

Based on trends in population and participation in postsecondary education, we have projected that there will be

approximately 20% more applicants to medical schools in 2012 than in 2000, an increment that is sufficient for the likely 20% increase in medical school enrollment but not sufficient for the desired 40% increase. Moreover, if by 2015 MD class size increases by 30%, which is the current goal of the AAMC, and if DO class size increases to 5000, as it is projected to do, and if, in addition, enrollment of US students in off-shore schools increases from the current level of approximately 3000 to 3500, there would be a total increment of 7000 medical students. However, the first time applicant-to-acceptance ratio of MD schools would slip to less than 1.4:1.0 and the overall percentage of applicants gaining admission somewhere would rise to greater than 90%. Simply stated, unless a pool of young people who do not now seek medical education materializes, there will be too few applicants in 2015 and the years thereafter to sustain quality as it is now measured. Yet, it is well accepted that the criteria used for selecting medical students and the examinations that test them are not predictive of success as a physician, and attention is increasingly being focused on the need to evolve a curriculum that is more strongly organized around values and ethics.¹⁵ Clearly, attention must be given to the admission process and the curriculum, and to the licensing examination that drives both.

A BETTER FUTURE

It is best to believe that all is well—that there are enough doctors—really too many—and, therefore, there is no need for more medical students or medical schools, or for more residents or residency programs, or for more funds for either. Moreover, it is comforting to believe that there are enough applicants and that they are the most uniformly qualified in history. Sadly, none of this is true. We have a looming doctor shortage, a woefully inadequate number of residency positions, a need for major expansion of medical schools and a crisis in the way medical students are selected, educated and tested. Never before in history—not in the time of Flexner nor during the great expansion of the 1960s and 1970s—has there been a greater need for leadership from organized medicine, foundations and government, and rarely before has there been so much complacency—indeed, “active inertia.” If we do not rise to meet the challenge, future generations will wonder what ours was all about, what purpose was served by allowing a great profession to stagnate

and why they and their loved ones must experience illness without access to a competent and caring physician.

But that need not happen. Both the American Surgical Association and the American College of Surgeons are firmly on record that GME must be expanded and that Medicare's caps on GME must be lifted. It is time for like-minded colleagues in other specialties to sign on to these goals so that a broad national consensus can be created. The medical profession has long accepted the responsibility for assuring an adequate supply of physicians. Fulfilling that responsibility is an obligation we must now embrace.

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