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THE MEDICAL SCHOOL REVISITED

by Robert H. Ebert

Prologue: The nation’s medical education enterprise has grown dramatically over the past fifteen years, thanks to federal policies that encouraged its expansion. This federal initiative led to an increase in the number of medical schools from 86 to 127 and a increase in medical school enrollment from 21,379 in 1960-61 to 67,016 in 1984-85. In the middle of this era, Dr. Robert H. Ebert, who at the time was dean of the Harvard Medical School, wrote an article in which he made some predictions on the future shape of graduate medical education. Now, some twelve years later, Ebert returns to that earlier work to ponder the accuracy of his forecast. Ebert predicted in his earlier article, published in the Scientific American in 1973, that medical education and medical practice were on the threshold of a new era, one in which external forces would come to play a far more influential role in their affairs. Ebert notes that change did not come nearly as rapidly as he anticipated, but that he still believes that major change is inevitable.

Even more intense pressures than those cited by Ebert are cascading down upon medical education, the most pervasive perhaps being the Reagan administration’s relentless pursuit of substantial reductions in domestic spending. Ebert is a particularly appropriate figure to survey the changes in medical education. His career spans the deanship of a medical school (Harvard), the presidency of a private foundation (Milbank Memorial Fund), and he is now serving as consultant to the Commonwealth Fund and The Robert Wood Johnson Foundation. Ebert has maintained a long interest in generalist training of physicians, arguing that medical education must achieve a better balance between primary care and tertiary, specialty-oriented teaching. Ebert was instrumental in the creation of the Harvard Community Health Plan, one of the first health maintenance organizations attached to a medical school. He also fostered the recruitment of minority students to Harvard Medical School, increasing their enrollment to 20 percent, a standard the school has largely maintained.
The training of physicians is in the midst of a period of rapid evolutionary change. The probable outcome will be the production of fewer specialists and more physicians capable of primary care.”

Those sentences stood out boldly as a subtitle to an article entitled “The Medical School” that I wrote for the September 1973 issue of Scientific American. As I looked back at the issues I had discussed in that essay, it was with some trepidation that I read on, wondering how, eleven years later, I could justify that statement and others that I might have made. I was relieved to discover that much of the essay dealt with a discussion of issues rather than predictions, and further, that an analysis of predictions that were incorrect might provide as much understanding of the forces at work as an examination of predictions that were accurate. I concluded that the subtitle was a more suitable one for an essay written the last week in 1984 than for one written eleven years earlier, since it has taken more time for the forces, both internal and external to the medical school, to effect change than appeared likely in 1973. Some factors noted in 1973 have turned out to be unimportant whereas others, not easily identified a decade ago, appear dominant today.

The fundamental thesis of my 1973 paper was that both medical practice and medical education have evolved through a series of eras since colonial times, the most recent being the Flexner era of scientific medicine, and that we are on the threshold of a new era. The Flexner era was catalyzed by the Carnegie Foundation’s critique of the nation’s medical schools authored by Abraham Flexner in 1910. However, reform of medical education and elevation of the standards of medical practice were implemented in large part by the leadership of the medical profession itself. What evolved was scientific medicine and specialty practice as we know it today, largely fueled by an open-ended payment system and guided by the leaders of the medical specialties who were also the leaders of the clinical departments in the nation’s medical schools. My thesis in 1973 was that transition to a new era would be influenced more by forces external to medicine than by those internal to it, and I believe that to be equally true today. It, has simply taken longer to happen than I had supposed a decade ago.

What Is Unique About The Education Of The Physician?

To the uninitiated reader, medical education must appear to be a strange aberration of the educational process as compared to education for the other professions such as law or engineering. There are two reasons for this. First, medical educators seem unable to agree on when the education of the physician begins and when it ends; and second, medical education seems to be inextricably intertwined with medical practice. If we restrict the discussion of medical education to the four years of medical
school, as is commonly done, we create an artificial definition for the education of the physician in the fourth quarter of the twentieth century. In 1910, it was entirely appropriate for Flexner to do so, but today “...the medical school experience spans a quite arbitrary period in the education of the physician, beginning as it does in the middle of one’s education in science and ending about one-third of the way through one’s clinical training.”¹³ The so-called basic medical sciences that are taught the first two years in medical school are no longer unique to medicine. They have the same base in modern cell biology and molecular biology as do their counterparts in faculties of arts and sciences. Thus, the distinction between biology taught to premedical students and the biology taught in medical school has largely disappeared. Unfortunately, few medical educators are willing to accept the premise that most of the science basic to medicine could be taught equally well to undergraduates as to medical students- as is done at Oxford and Cambridge. Further, the clinical education of the intern and resident differs from the education of the medical student only in its intensity and the narrowness of its focus. Yet this part of clinical education that occurs after the medical degree is granted is usually ignored in discussing medical education, even though it does more to shape the attitudes and thinking of the physician in training than any other part of the educational process.

The second feature of medical education that is unique is the environment in which it occurs. Law students do not learn in the courtroom, nor do engineers have classes on construction sites, but medical students receive their clinical education in the largest and technologically most advanced hospitals in the nation. Whether the experience is with sick, hospitalized patients or with less ill, ambulatory patients, they learn by providing care under the supervision of more experienced physicians.

The term academic medical center or academic health center has been coined to describe the complex of a medical school, one or more other professional schools, such as nursing, and one or more teaching hospitals. Theoretically, such centers are integral parts of universities, but, in fact, they are not. They are usually dominated by one major teaching hospital, and the primary function of that institution is the provision of medical care-a service function not shared with any other part of the university. Certainly teaching hospitals provide an environment for teaching and research, but they are more closely allied to the practice side of medicine than to the university.

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**Medical Education And The External Environment**

In 1973, I wrote: “...it is being argued with increasing force that medical care is a right and not a privilege and that one class of medical care should be available to everyone. Indeed, in contrast to the pressures that
“Now there are two dominant forces at work: a mandate from both the public and the private sectors for a better control of medical care costs, and a more conservative electorate that no longer accepts the philosophy of a welfare state as an unqualified good.”

brought about the Flexner era, the reform of medical education and medical practice is now being pressed by forces outside of medicine. They include consumer groups, members of Congress, labor, corporate industry (which pays a significant part of the health bill), and such nonmedical professionals as economists, sociologists, and a variety of experts in the fields of management and public policy. The demand is for more equitable distribution of medical service, better control of cost, and a change in the education of the physician.4

That statement is only partially correct today even though the same players are involved. Now there are two dominant forces at work: a mandate from both the public and the private sectors for a better control of medical care costs, and a more conservative electorate that no longer accepts the philosophy of a welfare state as an unqualified good. In any other field of education these forces would affect the educational establishment only indirectly, but they have a direct effect on medical education.

In 1973, teaching hospitals and academic health centers complained about cutbacks in funding from the National Institutes of Health (NIH) for research and research training (that in reality were only cutbacks in the annual rate of increase in funding), but in retrospect they were remarkably well-off financially. They were reimbursed on a cost-plus basis, and most were able to pass on to third-party payers, including the Health Care Financing Administration (HCFA), the cost of unreimbursed care. While they were more costly than nonteaching hospitals, this was justified on the basis of their role as tertiary hospitals that cared for sicker patients, the care they supplied for those unable to pay, and for their academic functions. Nor were they singled out for special scrutiny by those who paid the bills, including the federal government. Today all of that has changed. The same teaching hospitals are haunted by what may happen to them in an era of prospective payment of hospital costs and in the present pro-competition world of medical care.

Three aspects of prospective reimbursements on the basis of diagnosis-related groups (DRGs) worry teaching hospitals—how teaching costs will be calculated, the length-of-stay in the teaching environment, and how
those teaching hospitals that provide a significant amount of care for the uninsured will be reimbursed for free care. It is quite likely that the length-of-stay issue can be dealt with though it will probably lead to more readmissions, and if free care provided by private teaching hospitals is not reimbursed by someone, the medically indigent will be referred to public hospitals, as is often the case today. Teaching costs, however, are another matter. It is impossible to eliminate teaching costs and remain a teaching hospital. Thus, teaching hospitals are now faced with the unhappy task of justifying the reimbursement of teaching costs using patient care dollars. A more conservative electorate is likely to be unimpressed with the argument that it is in the public interest to subsidize the education of physicians, given the fact that doctors are among the highest earners in our society.

Presidential commissions still speak of society's obligation to insist on equity in the provision of medical care, and even among a conservative majority, few would argue that those unable to pay should go without medical care. But equity of access is not synonymous with a one-class medical care system, and there appears to be little public concern for a system that seems destined to remain two-tiered for the remainder of the century. Instead, there is debate about who will pay for the care of the poor and how it will be distributed. In 1973, it seemed possible that hospitals designed specifically for the care of the poor would be phased out, but that appears unlikely to happen in the near future. It is more likely that for the remainder of this century we will continue to depend upon municipal, state, and Veterans Administration hospitals for the care of the largest proportion of the poor. Traditionally, medical schools have used hospitals serving the poor more heavily for teaching and research than they have used those hospitals serving the nonpoor. For example, a university hospital in New York City is used primarily for the diagnosis and treatment of private patients cared for by members of the clinical faculty, while an affiliated municipal hospital is the major teaching resource. Clearly, medical faculties have no great incentive to work for the establishment of a one-class system of care.

There continues to be some public concern for how we educate physicians. Have they become technocrats with little concern for the human side of medicine, and are they overspecialized? Americans are critical of the medical profession as a whole and of the medical care system, yet the great majority are satisfied with the care they receive from their own physicians. One can only conclude that the general public has at best a peripheral interest in reform of medical education.

### Access To Medical Care

In the late 1960s and early 1970s access to medical care became the
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The major issue addressed by those interested in health legislation. Interest in this issue was not only driven by a desire to improve access for the poor and the elderly, but was further generated by more affluent individuals and representatives of middle-class communities who complained to their Washington representatives that it was difficult to find M.D.s who would act as family physicians. General practitioners who retired were not replaced, and many more communities were without medical service in the immediate vicinity.

Just why the issue of access to care should have reached almost a crisis proportion in terms of a congressional response is, in retrospect, puzzling given the fact that access to care steadily improved during the 1950s and 1960s. Perhaps entitlement to medical care made possible by the legislation authorizing Medicare and Medicaid in the mid-1960s caused a significant increase in demand for care since there was an unmet need among the elderly and the poor. Access to care is no longer considered a major problem today, but it certainly was in the late 1960s and early 1970s, and policy leaders in Washington decided there were too few doctors, there was geographic maldistribution of physician service, and too few family physicians. In a series of health manpower bills between 1963 and 1976, Congress subsidized the creation of new medical schools, provided capitation allowances for medical schools willing to expand class size, subsidized the education of physician extenders (physician assistants to nurse practitioners), and provided funding for the training of family physicians. A National Health Service Corps was formed to provide physicians for medically underserved areas. Medical students who joined the corps were provided with funds to pay the costs of their medical education, and in return, accepted assignments to medically underserved areas following graduation and a period of postgraduate training. It was hoped that many such young physicians would stay in the underserved areas to which they had been assigned after their period of indenture was concluded.

As a direct result of federal legislation, there was an expansion of the number of medical schools from 86 to 126 and an increase in medical school enrollment from 21,379 in 1960-61 to 63,800 in 1979-80. In fact, the programs were so successful that worry about a shortage of physicians was replaced by concern for a future oversupply.
become evident that we might be training too many physicians, consideration was given to health manpower legislation that would tie capitation to the requirement that at least 50 percent of residency positions in hospitals affiliated with a medical school–qualifying for federal capitation would have to be in primary care fields (defined as family medicine, internal medicine, pediatrics, and obstetrics). This requirement became moot once it was decided that capitation would be phased out; but, for whatever reasons, this goal has been reached on a national basis. Today, 49 percent of all residencies are in primary care, compared to 38.4 percent in 1973. As shown in Exhibit 1, the percent increase in the number of primary care residents between 1973 and 1983 ranges between 36 percent for obstetrics and gynecology to 4.52 percent for family medicine. These increases cannot be attributed to an increase in the number of medical school graduates. In 1983, there were 16,180 more residents in training than in 1972, 14,020 of whom were in primary care residencies, a 65-percent increase. In contrast, there was an increase of only 2,160 or 6 percent in the number of residents in all other specialties, and there was an absolute decrease in the number of residents in some fields such as general surgery. In 1972, there were 9,025 surgical residents as compared to 7,882 in 1983—a decrease of 13 percent.

For the vast majority of Americans, access to medical care is not a problem today. In a study sponsored by The Robert Wood Johnson Foundation, it was determined that nearly 90 percent of the population has a usual source of care and 80 percent saw a physician in the previous year. The percent of nonwhites seeing a physician in the past year increased from almost 50 percent in 1970 to over 80 percent in 1982, while during the same period, the percentage of whites seeing a physician in the previous year increased from a little over 70 percent to a little over 80 percent.

### Exhibit 1
Comparison Of Residents On Duty In Primary Care Residencies (Plus Internships) In 1972 And 1983

<table>
<thead>
<tr>
<th>Year</th>
<th>Internal medicine</th>
<th>Family practice</th>
<th>Pediatrics</th>
<th>Ob-Gyn</th>
<th>Total primary care</th>
<th>Total residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>12,546</td>
<td>1,312</td>
<td>4,219</td>
<td>3,520</td>
<td>21,597</td>
<td>56,244</td>
</tr>
<tr>
<td>1983</td>
<td>17,610</td>
<td>7,236</td>
<td>6,140</td>
<td>4,631</td>
<td>35,617</td>
<td>72,424</td>
</tr>
<tr>
<td>Net increase between 1972 and 1983</td>
<td>5,064</td>
<td>5,924</td>
<td>1,921</td>
<td>1,111</td>
<td>14,020</td>
<td>16,180</td>
</tr>
<tr>
<td>Percent increase</td>
<td>40%</td>
<td>452%</td>
<td>46%</td>
<td>36%</td>
<td>65%</td>
<td>29%</td>
</tr>
</tbody>
</table>

*In 1972, figures include straight internships and rotating internships with a major emphasis in the specialty.*

*The nomenclature has changed and interns are now called PG 1 in the specialty.*

*In 1972, this figure included 271 individuals in general practice residencies, 70 percent of whom were FMGs.*
The percentages of low-income persons seeing a physician the previous year increased from 55 percent to 80 percent compared to an increase from a little over 70 percent to 85 percent for high-income individuals from 1970 to 1982. These figures should not be interpreted to mean that problems of access have disappeared. Twelve percent, or 28 million people, had some difficulty with the medical care system according to this survey, and those in difficulty were the poor, members of minority groups, and the uninsured. Lack of insurance appeared to be the single most important factor in blocking access to adequate care.

It is not clear why a larger percentage of both poor and non-poor should seek medical services during 1982 than in 1970, but it does suggest that the medical care system in 1982 could accommodate a greater demand for physician services. Was this because of an increase in the overall number of physicians, or because of an increase in the number of primary care physicians? The literature abounds with articles about the need for primary care physicians, and for many essayists, it has become an article of faith that every person in our society should have a primary care physician to act as gatekeeper to the specialties of medicine. It was this philosophy that motivated the recommendation that the percentage of primary care residencies should be mandated by Congress in order to qualify for capitation. In light of this debate, two facts are of interest. The first is that the percentage of residents in primary care residencies seems to have responded to the marketplace, without the need for further government regulation. The second fact is that subspecialists provide a considerable amount of primary care—if one defines primary care as the principal care received by a patient.

In a study of medical practice in the United States sponsored by The Robert Wood Johnson Foundation and carried out at the University of Southern California School of Medicine under the supervision of Robert Mendenhall, a careful analysis was done of how physicians spend their time. The study analyzed practice encounters in four ways: first encounters, principal care encounters (in which the physician provides the major portion of care), consultative encounters, and specialized care encounters. According to conventional wisdom, one would anticipate that only in the primary care specialties would physicians report a high percentage of their practice time devoted to principal care encounters. Percentages were indeed high, and ranged from 61.9 percent in internal medicine to 80.1 percent in general practice, but what was striking was the large amount of practice time devoted to principal care encounters by subspecialists. Over 68 percent of practice time of nephrologists and oncologists was devoted to principal care; and gastroenterologists, cardiologists, hematologists, rheumatologists, and pulmonary disease specialists spent between 42 percent and 58 percent of their time in principal care encounters. This study demonstrated a fact long suspected by most subspecial-
ists, namely that many persons with chronic diseases receive most of their care from specialists rather than from primary care physicians.

The Medical Education Establishment

Since World War II, academic health centers have evolved in a reactive fashion, largely in response to sources of funding rather than the needs of medical education, with the result that they may become the dinosaurs of the new era of prospective payment and pro-competition medical practice. They first grew in size and complexity because generous funding was made available for research and research training by the NIH. This was also the beginning of the Balkanization of medical school governance caused by the funding of individual investigators, specialty divisions, or departments rather than institutions. Between 1960 and 1970, the number of preclinical faculty in American medical schools increased by 106 percent, full-time clinical faculty by 167 percent, while the number of medical school graduates increased by only 34 percent. Clearly the increase in faculty size is unrelated to teaching needs.

The number of medical school graduates increased 114 percent between 1970 and 1980 in response to capitation allowances based on a formula that required an increase in class size and because twenty-five new medical schools were funded during the decade of the 1970s. During the same period, the number of preclinical faculty increased by 57 percent, and clinical faculty by 90 percent. Given the cutback in research funding during the 1970s and the earlier large increase in clinical faculty size, one can only assume that this second large increase in full-time clinical faculty was related to the increase in the size and number of faculty practice plans that had become the single most important source of medical school funding by the beginning of the 1980s. Faculty practice plans were a natural outgrowth of specialty medicine that came to dominate academic medical centers.

Clinical departments in major teaching hospitals were in the forefront of research and development of new clinical procedures, and many of these procedures, particularly in the surgical specialties, became lucrative sources of income. Income production became so important that it sometimes seemed to obscure the reason why income was needed—namely, to support the educational enterprise.

Residents and fellows are key to the integrity of clinical departments in major teaching hospitals. They provide an enormous amount of patient care, they extend the capacity of full-time faculty to care for private patients and therefore generate more money, and they play an important role in the teaching of medical students, yet there has always been reluctance to define just what they are. They are called students for the purpose of reimbursement for the cost of graduate medical education, they are employees when it comes to paying their own income taxes, and they
“Medical schools seem more concerned with survival than with innovation, yet it may be that survival is really dependent on a radical reexamination of what medical education is all about.”

are sometimes designated as junior faculty to justify their teaching role. Whatever they are called, academic medical centers could not survive without them, and that is why there is such grave concern in the medical education establishment about who will pay for graduate medical education in the future. At present, 83 percent of the funding for resident stipends and benefits (excluding the VA) comes from patient revenues, and 62.5 percent of stipends and benefits for fellows comes from the same source. Including the VA, 70 percent of resident stipends and benefits is funded from patient revenues. The total cost of these stipends and benefits for 1983-84 amounts to $1.7 billion— not an insignificant amount. In October 1984, Senator David Durenburger (R-MN) introduced legislation that would separate payments for graduate medical education from prospective payment for patient care by Medicare. He proposes to provide block grants to states to pay for graduate medical education using the Medicare trust fund as the source of funding. Though not mentioned in the proposed legislation, he and others have questioned the need to support the cost of residency training beyond year three. Because residents and fellows play such a key role in the entire medical education establishment, any radical change in the way they are paid for could have a devastating effect on the integrity of academic medical centers.

Curriculum And The Like

In the mid-1970s The Commonwealth Fund launched the Interface Program that provided funding for medical schools and universities willing to experiment with teaching at the interface between college and the preclinical years of medical school. There were some great successes, notably at Boston University and Brown, but there were also failures largely attributable to the reluctance of medical school admission committees and medical school faculties to relinquish any autonomy. Some important lessons were learned, however, and it may be that economic forces will revive an interest in the results of this experiment.

Apart from the Interface Program, remarkably little that is new has been introduced into the medical school curriculum during the past decade. Medical schools seem more concerned with survival than with innova-
tion, yet it may be that survival is really dependent on a radical reexamination of what medical education is all about. The Interface Program was a start, and asked the question, Does the sharp separation between the last two years of college and the first two years of medical school make any sense since it neither enhances general education nor education in the basic medical sciences? Perhaps the first year or year-and-a-half of medical school should be part of a college education.

Clearly related is the question of the relationship between the clinical years of medical school and the first three years of residency training. I have suggested a way that these might be integrated, but there appears to be no interest whatsoever in the suggestion, not, as nearly as I can judge, for educational reasons, but rather for reasons of turf and control. Clinical departments are determined to guard their control of residency training, yet it may be that the solution to who will pay for graduate education can only have a rational solution if there is a better analysis of how student status changes into practicing physician status as a continuum, and not abruptly in quantum jumps. Medical students provide some service during their clinical years of training, and the amount of service provided increases considerably in the first postgraduate year, but both medical students and first-year residents continue to be students so that the change in function is a quantitative one rather than qualitative. Similarly, the more advanced the resident becomes, the more like a member of the teaching faculty he becomes. Hadley and Tigue point out that residents and teaching physicians actually pay for most of the costs of graduate medical education by providing services that approximate the salaries they are paid. These authors suggest that teaching hospitals be reimbursed on the basis of outputs rather than inputs. It is unlikely that the clinical education of the physician through what is now the third year of residency could be financed without special subsidy. Nevertheless, it should be possible to define more accurately the gradual transition for student status to practicing physician-teacher status, and to fund accordingly.

Finally, medical schools must ask themselves, How suitable is the tertiary care, specialty-oriented, teaching hospital as the primary environment for teaching both medical students and residents? Given the fact that most physicians will spend far more time in office practice than caring for hospitalized patients, is it not desirable to develop other teaching environments? The Harvard Community Health Plan (a prepaid group practice plan) was founded in 1968 with that in mind and has been used for teaching primary care residents, but only now is a meaningful medical student teaching program being developed. It is not easy to do so, but it can be done, and it must be done.
In 1973, I made six predictions-two of which were wrong, one partially right, and three correct.\(^1\) (1) The educational experience will be shortened and much of what is taught in the first year-and-a-half of medical school will be targeted at the undergraduate level. This was clearly wrong, but it may be that a rising debt load for students seeking a medical education will result in some shortening in the future. (2) The basic sciences will become an integral part of the university and clinical training will become more detached from the university. Wrong, even though clinical departments are in fact quite detached from the rest of the university. (3) Physician assistants will not replace physicians as providers of primary care. Correct. (4) The number of medical students receiving the M.D. degree will rise, perhaps even to the point of oversupply, and this development will cut down or eliminate the importation of foreign medical graduates (FMGs). Correct. An oversupply of physicians is now predicted and the number of FMGs entering the system has been sharply reduced. In 1972, 33 percent of all interns and residents were FMGs, compared to 18 percent in 1983.\(^2\) The absolute number was reduced from 18,195 in 1972 to 13,221 in 1983, and 53 percent of the 13,221 FMGs in 1983 were United States citizens. (5) The number and quality of residency programs will be brought under tighter regulation, and training opportunities for primary care physicians will gain predominance over programs for specialists. Partially correct, but regulation has come from the profession and not government. (6) The number of women and numbers of minority groups entering medicine will increase, thereby aiding in the solution of the problem of equitably distributing medical services. Correct, although the admission of minorities has plateaued at about 12 percent, whereas the percent of women entering medical schools now approaches 32 percent.

In conclusion, there has been substantial change in the distribution of residents among the specialties. Now 49 percent of all residents are in primary care residencies, but the medical education establishment has changed little in other ways, except to become increasingly dependent on income from fee-for-service, high-technology medicine. Over the past three-quarters of a century, the practice of medicine has been influenced profoundly by patterns of specialty practice that evolved in academic medical centers. Today, it seems more likely that evolving patterns of practice in the community will influence what happens to academic medical centers rather than the other way around. This is borne out by a case study of the University of Wisconsin Medical School which showed that the medical center was unable to compete on the basis of price with non-academic prepaid group practice plans.\(^3\)
4. Ebert, “The Medical School.”
15. Ibid.
17. S. 3073 by Mr. Durenberger, “A bill to amend title XVIII of the Social Security Act to provide for grants to states for graduate medical education and other clinical training activities, and to replace the current Medicare reimbursement for the direct costs of such activities; to the Committee on Finance,” *Congressional Record*, No. 131, Part II (5 October 1984).
19. Ebert, “Can the Education of the Physician Be Made More Rational?”
21. Ebert, “The Medical School.”