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The Development of American Medical Education from the Turn of the Century to the Era of Managed Care

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American Medical Education in the Mid-1800s

In the mid-nineteenth century, it was easy to become a doctor in America. Entrance requirements to medical school were non-existent other than the ability to pay the fees. The standard course of instruction in the mid-nineteenth century consisted of two four-month terms of lectures during the winter, with the second term identical to the first. The curriculum generally consisted of seven courses: anatomy; physiology and pathology; materia medica, therapeutics, and pharmacy; chemistry and medical jurisprudence; theory and practice of medicine; principles and practice of surgery; and obstetrics and the diseases of women and children. Instruction was wholly didactic: seven or eight hours of lectures a day, supplemented by textbook reading. Laboratory work was sparse, and even in the clinical subjects, no opportunity to work with patients was provided. Examinations were brief and superficial; virtually the only requirement for graduation was the ability to pay the fees. Students who wished a rigorous medical education had to supplement what they learned in medical school in other ways, such as through enrollment at non-degree-granting extramural private schools, study in Europe, or work in hospitals as "house pupils."

Mid-nineteenth century medical schools were autonomous institutions. University or hospital affiliations, in the few cases in which they existed, were nominal. The faculties were small, typically consisting of six or eight professors. The professors owned the schools and operated them for profit. A commercial spirit thus pervaded the schools, for the faculty shared the spoils of what was left of student fees after expenses. For this reason the schools were commonly called "proprietory schools." The mark of a good medical school, like that of any business, was considered its profitability. Since an amphitheater was virtually the only requirement to operate a medical school, physical facilities were meager. The second floor above the corner drug store would suffice; a school that had a building of its own was considered amply endowed.

The Creation of the Modern American Medical School

While American medical education was floundering in the mid-1800s, the reform of the system was already beginning. At the root of the transformation was a series of underlying events: the revolution in experimental medicine that was proceeding in Europe; the existence of a cadre of American doctors traveling to Europe (particularly Germany) to learn laboratory methods; the emergence of the modern university in America; the development of a system of mass public education to provide qualified students for the university; and the cultivation of a habit of philanthropy among some very rich industrialists. Together, these developments provided the infrastructure for a new system of medical education soon to appear.

The creation of America's current system of medical education occurred in two overlapping stages. In the first stage, which began in the middle of the nineteenth century, a revolution in ideas occurred concerning the purpose and methods of medical education. After the Civil War, medical educators began rejecting traditional notions that medical education should inculcate facts through rote memorization. Rather, the new objective of medical education was to produce problem-solvers and critical thinkers who knew how to find out and evaluate information for themselves. To do so, medical educators deemphasized the traditional didactic teaching methods of lectures and textbooks and began speaking of the importance of self-education and "learning by doing." Through laboratory work and clinical clerkships, students were to be active participants in their learning, not passive observers as before. A generation before John Dewey, medical educators were espousing the ideas of what later came to be called "progressive education."

At the same time, a revolution occurred in the institutional mission of medical schools. The view emerged that the modern medical school should not only engage in the highest level of teaching but also should be committed to the discovery of new knowledge through research. This meant that medical schools could no longer remain freestanding institutions. Rather, they had to become integral parts of universities and hire scientifically trained, full-time faculty who, like all university professors, were researchers as well as teachers.

In the early 1870s, the first lasting reforms occurred, as Harvard, Pennsylvania, and Michigan extended their course of study to three years, added new scientific subjects to the curriculum, required laboratory work of each student, and began hiring full-time medical scientists to the faculty. In the late 1870s, the plans for the new Johns Hopkins Medical School were announced, though for financial reasons the opening was delayed until 1893. When the school finally did open, it immediately became the model by which all other medical schools were measured, much as the Johns Hopkins University in 1876 had become the model for the modern American research university. A college degree was required for admission, a four-year curriculum with nine-month terms was adopted, classes were small, students were frequently examined, the laboratory and clinical clerkship were the primary teaching devices, and a brilliant full-time faculty made medical research as well as medical education part of its mission. In the 1880s and 1890s, schools across the country started to emulate the pioneering schools, and a campaign to reform American medical education began. By the turn of the century, the university medical school had become the acknowledged ideal, and proprietary schools were already closing for lack of students.

Nevertheless, ideas alone were insufficient to create the modern medical school. The new teaching methods were extremely costly to implement, and hospitals had to be persuaded to join medical schools in the work of medical education. Thus, an institutional as well as an intellectual revolution was needed. Between 1885 and 1925 this revolution occurred. Large sums of money were raised, new laboratories were constructed, an army of full-time faculty was assembled, and clinical facilities were acquired. Medical schools, which had existed autonomously during the proprietary era, became closely affiliated with universities and teaching hospitals. Catalyzing this process was an influential muckraking report in 1910 by Abraham Flexner of the Carnegie Foundation, which vividly contrasted the ideal conditions of medical education, as exemplified by the Johns Hopkins Medical School, with the deficient conditions that still existed at so many other medical schools

In retrospect, it is remarkable how easily the fund-raising task went. Medical schools everywhere in the country enjoyed astonishing successes at raising large amounts of money from the public. However, the task of acquiring suitable clinical facilities proved much more formidable. Most medical schools in the late nineteenth century had affiliations with hospitals, but the schools were severely restricted in how they could use those facilities. Medical schools could not appoint the hospital staffs to assure that hospital physicians had academic as well as clinical credentials, and medical faculty were seldom permitted to engage in clinical research. Most important, with a few exceptions, medical students were not permitted to work in the hospital wards as clinical clerks. The clerkship was alive and healthy at Johns Hopkins, where it had been introduced by William Osler in 1893, and it was functioning with moderate success at the University of Pennsylvania, the University of Michigan, Jefferson Medical College, and Western Reserve. Elsewhere it was languishing, so that educationally meaningful contact between students and patients remained very uncommon.

These problems arose from the reluctance of hospitals of this period to assume a responsible role in medical education. Hospitals at this time tolerated medical student teaching, reluctantly, as long as it was carefully regulated and did not interfere with their other functions. Hospital trustees often professed their desire to participate in medical education, but what they had in mind was instruction of a very restricted sort: amphitheater lectures, ward walks, outpatient clinics, and section teaching—but not the clerkship. Students in the early 1900s could receive good training in physical diagnosis and the use of certain medical instruments, but they were rarely permitted responsible contact with patients. Indeed, students endured repeated indignities. Throughout the nineteenth century, if they were permitted to enter hospitals at all, they were frequently required to use separate entrances.

No institution better illustrated the unwillingness of hospitals of this period to participate in medical education than Roosevelt Hospital of New York City. After the Civil War Roosevelt established a relationship with Columbia University's College of Physician and Surgeons, and soon the hospital became the medical school's major clinical resource. Roosevelt's amphitheaters and clinics were regularly used by the school for teaching, and the hospital was a popular choice among Columbia students for fourth-year electives. Recognizing this fact, the medical school asked Roosevelt three times—in 1905, 1908, and 1910—to become a true teaching hospital, as the Johns Hopkins Hospital had become a true teaching hospital for the Johns Hopkins Medical School. In exchange, the medical school offered to build Roosevelt a new surgical pavilion and secure it a $1,300,000 endowment. Each time, however, Roosevelt rejected the proposal, mainly because it did not wish to have medical students working in the wards as clinical clerks. In frustration, Columbia turned to Presbyterian Hospital, which in 1910 agreed to become a true teaching hospital based on the Johns Hopkins model.

The consequences of these events were different for Presbyterian and Roosevelt Hospital. Presbyterian, by virtue of its relationship with the medical school, became a great international center of medical education and research. Roosevelt, in contrast, went into eclipse. It never again served as the central teaching facility of a medical school, and as a result it became nothing more than another fine community hospital. It literally had the opportunity for international eminence in medicine in its hands, but it threw that opportunity away.

From the perspective of medical history, the example of Roosevelt Hospital clearly illustrates that the limiting factor in medical education in the early 1900s came from the hospital side, not the medical side. However, there are other lessons as well. As officials of Roosevelt Hospital discovered, no hospital—then or now—can lay claim to any more than local significance without a close and harmonious relationship with a medical school. In addition, there was nothing in the external environment that dictated that Presbyterian would become a medical Mecca while Roosevelt would descend into mediocrity. Both events resulted from decisions the respective hospital boards made of their own initiative. This is an important reminder to us today as we are forced to contend with the powerful external forces of the medical marketplace. Just as the past was not predetermined, neither is the future. It can be—and will be—influenced by the choices we make today and principles we choose to defend.

By the 1920s, the institution-building process in American medical education was complete. The money to support medical education properly had been raised, and the modern teaching hospital had been invented, allowing the special problems of clinical education to be resolved. In addition, an outraged public, scandalized by Flexner's acerbic depiction of the proprietary schools still in existence, brought a sudden end to the proprietary era through the enactment of state licensing laws. These laws mandated that medical schools operated on a for-profit basis would not be accredited.

In reflecting on the creation of the modern medical school in America, four themes are particularly apparent. First, the pioneering first- and second-generation medical educators brilliantly illustrated "proactive" behavior at its best. They defined the ideal principles of medical education, and then they changed the environment to allow those principles to be implemented. Second, their greatest single achievement was the invention of the teaching hospital. The modern teaching hospital provided a rich learning environment for students and house officers by allowing them to be active learners who assumed real responsibility for patient care. Third, medical schools became integral parts of universities, having hired full-time faculties committed to

research as well as teaching. Lastly, the process was made possible by the creation of an implicit social contract between medical schools and society. Society agreed to provide medical schools the necessary financial and clinical resources. In return, medical schools made clear that they were public trusts that were accountable for the public assistance they were receiving.

The Evolution of Current Dilemmas

By the 1920s, the American medical school was mature, and its importance to the public could scarcely be exaggerated. In the 1930s, its size, influence, and scientific capacity grew, and this served as a prelude to even more dramatic growth that occurred after World War II. By the end of the century, the "academic medical center"—the term used to describe the medical school and its affiliated teaching hospitals—was typically a huge and intimidating complex, occupying many city blocks, employing thousands of people, and engaged in the most advanced research and patient care.

How did such a seemingly powerful institution become vulnerable to the medical marketplace at the end of the century? To answer this question, it is important to remember the delicate balance that exists at medical schools between their university duties of education and research and their responsibilities to engage in patient care. Full-time clinical faculty must see patients in order to maintain their clinical and teaching skills and to obtain material for research. In addition, faculty practice enhances medical education, for it allows students and house officers to be exposed to exemplary clinicians practicing the highest quality of medical care. However, too much patient care can easily interfere with the academic work of a medical school by taking time and energy away from teaching and research. Throughout the twentieth century, one of the most difficult tasks confronting American medical schools was finding a way to discharge their patient care responsibilities without losing sight of their academic mission.

Between World War I and World War II, American medical schools achieved a balance between their university and clinical duties that allowed academic work to thrive. To clinical faculty of this era, their university identity came first. They considered themselves students of problems and trainers of future generations of physicians. They engaged in private practice only to the degree necessary to remain clinically, scientifically, and educationally alive. This behavior was made possible because medical schools at that time were not financially dependent on faculty practice. For example, at the Johns Hopkins School of Medicine in the late 1920s, fees from private patients from all clinical departments amounted to around $10,000 per year—hardly evidence that the full-time staff was being diverted into routine patient care.

After World War II, academic medical centers became much busier clinically than before, and full-time clinical faculty found themselves with increasing patient care responsibilities. Much of this change resulted from the spread of private medical insurance after the war. Millions of middle class citizens were now financially empowered to seek care at teaching institutions if they were ill. Nevertheless, on balance, in the 1950s and 1960s clinical practice remained subordinate to education and research. This circumstance again resulted from the fact that medical schools were not heavily dependent for their income on the practice of medicine by full-time faculty. Through 1965, U.S. medical schools on average obtained only 6 percent of their budget from faculty practice.

The enactment of Medicare and Medicaid in 1965 represented a major turning point for American medical schools. Medicare and Medicaid have accomplished much good and continue to do so today. However, there were also unintended consequences of this legislation, some of which affected academic medical centers. With the stroke of a pen, millions of charity patients were converted into private, paying patients. Immediately, the clinical responsibilities of medical faculties increased enormously, ushering in what in *Time to Heal* I called the "clinical era" of American medical education.

The growth of the clinical enterprise after 1965 is readily apparent from statistical data. In 1945, there were 3,500 full-time faculty members at U.S. medical schools, and elite, research intensive schools such as Johns Hopkins had budgets of about $2,000,000. By 1965, at the peak of the "golden era" of the National Institutes of Health, the number of full-time faculty in the country had grown to l7,000, and the most prominent schools had budgets of around $20,000,000. Roughly 60 percent of a typical medical school's budget at this time came

from federal research spending. In the mid-1970s, as the "clinical era" gained momentum, patient care dollars surpassed research dollars as the largest source of revenue for medical schools. By 1980, clinical income from faculty practice accounted for 50 percent of the revenue of the country's medical schools. In 1990, there were about 85,000 full-time faculty members at U.S. medical schools, with almost all the growth since 1965 occurring in the clinical departments. A large percentage of clinical faculty spent almost all their time in the ordinary practice of medicine, carrying minimal if any teaching or research responsibilities. The most prominent schools now had budgets of around $400,000,000. Such were the transforming effects on the country's medical schools from the infusion of clinical dollars.

Nevertheless, during the twenty-year period following the enactment of Medicare and Medicaid, medical schools on balance managed to retain their academic atmosphere. This occurred for two reasons. First, in the fee-for-service era, payments from third-party payers were sufficiently generous to help underwrite the academic mission of medical schools. On average, 22 percent of faculty practice dollars at U.S. medical schools were used to cross-subsidize research and educational programs. In addition, in the fee-for-service era, third-party payers did not attempt to dictate patient management. Patients could remain in the hospital long enough to legitimately tend to their medical needs. Coincidentally, this was long enough to allow educational objectives to be met as well.

However, the die had been cast. With so much of the income of academic medical centers coming from one source, they were increasingly dependent on the good will of those who paid the bills. Through the 1980s, third party payers reimbursed academic medical centers without questions or conditions, creating the illusion that the power of academic medical centers might continue indefinitely. However, in the 1980s third party payers revolted, creating the "managed care" era that has continued through the present. For the past decade and a half, insurance companies and governments have been much more parsimonious in their payments to medical schools and teaching hospitals. This has precipitated both a financial and an educational crisis at academic medical centers that threatens the training of our country's doctors and ultimately the quality of care available to our citizens.

Medical Education in the Era of Managed Care

The most obvious consequence of today's market-driven health care environment for academic medical centers is financial. Because of education, research, charity care, and a sicker case mix of patients, the costs of teaching hospitals run about 25 to 30 percent higher than those of community hospitals. Previously, third party payers were willing to accept higher bills from teaching hospitals to cross-subsidize these socially important activities. In the 1990s, however, insurers were increasingly unwilling to do so. Instead, they insisted on paying only for the costs of hospital care actually incurred by their enrollees. Accordingly, the margins teaching institutions depended on for education and research were whittled away. In 2000, the University of Pennsylvania Health System—one of the country's strongest and best medical centers—suffered a $200,000,000 operating loss. It has been estimated that if current trends go unchecked, as many as two-thirds of teaching centers will be operating in the red within five years. Academic medical centers now find themselves in a buyers' market indifferent to their needs—a market where insurers are rapidly withdrawing from the support of socially valuable functions they had nurtured for over half a century.

From the educational perspective, the greatest problems have arisen from the responses of teaching institutions to these financial pressures. In general, academic medical centers have responded to the lower payments they are receiving by increasing the volume of patients they see. By caring for enough patients fast enough, they hope to remain solvent, at least for the moment. Such behavior, though understandable from a purely business perspective, comes at a great price: academic medical centers have begun to lose sight of their mission and raison d´ être. Institutional survival is being accomplished, but in the process the core principles those institutions have been entrusted to preserve are being sacrificed. Today, academic medical centers are rapidly losing their academic qualities—even as many medical educators and university officials proudly congratulate themselves on their "proactive" behavior in the changed marketplace.

The market's erosive effects on medical education are exerted in many ways. For instance, fewer and fewer clinical faculty are available to serve as teachers and mentors. Instead, today's faculty are under intense pressure to be "clinically productive"—that is, to see as many paying patients as possible so that they can help keep the medical center financially afloat. (The common definition of "clinical productivity" at medical schools refers to the amount of professional fees generated, not to the quantity or quality of care. Delivering ordinary care to paying patients is considered clinically productive; delivering outstanding care to charity patients is not.) This writer knows of a chairman of internal medicine at a prestigious medical school who has told his faculty, "If you want to teach, do so at lunch—and keep your lunches short." Because of such pressures, many clinical faculty presently have little time to teach, advise, serve as mentors, or conduct research. In addition, medical students' opportunities to observe faculty doctoring in a teacherly, caring way are dwindling. If there was one tenet of medical education that helped to ensure medicine's place as a university discipline in the twentieth century, it was the importance of conducting medical education in a scholarly environment. This principle is being violated by the shift in emphasis from teaching and research to patient care and by the conversion of a scholarly faculty into an exclusively clinical faculty.

Though teachers are important to the learning environment, the opportunity for students to spend ample time with patients is even more critical. In this respect, the marketplace has again been extremely injurious to clinical learning. Through the mid-1980s, the average length of stay at teaching hospitals was 10 to 12 days. Now, it is three to four days. In part this change reflects technological advances in medical care, such as the growing use of minimally invasive surgery. However, it largely represents the attempt by third-party payers to reduce hospital costs. Short hospital stays have forced medical schools to conduct clinical education in an atmosphere in which speed is the principal mandate for patient care. As a result, students are being converted from active learners to passive observers, with deleterious consequences for their ability to acquire fundamental knowledge and skills.

Among the negative effects of today's clinical environment on the education of students is its impact on the acquisition of cognitive skills. It is much harder for learners to develop problem-solving abilities when patients are admitted with their diagnoses known and treatment plans already determined. Clinical clerks in surgery, meeting patients under the drapes of the operating table, can still learn about removing a gall bladder, but such encounters do not teach students to recognize the patients who might actually need the procedure from those who do not. Once admitted, patients are often discharged before a diagnosis has been made or the effects of therapy observed—or even before an attending physician has had the chance to confirm a physical finding. These circumstances deprive students of the opportunity to follow the course of disease and treatment.

Of equal concern are the negative implications of this hurried environment for the all-important latent learning of the "hidden curriculum." Habits of thoroughness, attentiveness to detail, questioning, and listening are difficult to instill when learning occurs in a clinical environment more strongly committed to patient "throughput" than to patient satisfaction. In addition, it is hard to imagine how caring attitudes can easily be developed when medical education is conducted in a highly commercial atmosphere where a good visit is a short visit, patients are "consumers," and institutional officials speak more often of the financial balance sheet than of the relief of suffering.

Thus, as the twenty-first century begins, the university system that characterized American medical education during the twentieth century is being taken apart, and a second revolutionary period in American medical education is starting. The challenge of the first revolution in medical education was to pull medical education from the environment of medical practice into the university. Now, medical educators are raising the question whether medical schools should leave their universities to join integrated delivery systems. A task of the first revolution was to establish research as a major focus of the medical school. Today, medical educators often find themselves apologizing about research, and some even have asked whether the classic model of the research-intensive medical school should be allowed to persist in the future. A goal of the first revolution had been to make medical education a true university activity by freeing medical professors from having to practice medicine to make a living. Now, as at the proprietary schools a century before, clinical faculty find themselves increasingly dependent on private practice for their livelihood. A central mission of the first

revolution was to create a stimulating learning environment to help assure that medical education would be graduate education rather than vocational training. At the turn of the new century, the clinical learning environment is rapidly eroding, with serious implications for the quality of medical education. During the first revolution, university presidents had taken a deep interest in medical education, and many had helped lead the movement to create a strong system of university-based medical schools. Today, few university presidents are defending medical schools' goals of education and research, and even fewer seem to be aware that medical schools are in danger of leaving the university. These comparisons could be continued, but it is clear that medical education at present is reverting toward a proprietary system that university and medical leaders self-consciously had rejected a century ago.

Restoring the Social Contract

As the above discussion has shown, academic medical centers find themselves at the dawn of a new century with less self-confidence and a greater sense of loss of control than at any time in nearly a century. Yet, for advocates of quality in medical education, there is reason not to despair. The past, bearing as it always does on the present, harbors the principles by which academic medical centers and society can better serve each other so that high standards might be retained. Specific solutions will need to be crafted for the twenty-first century; tactics appropriate for one time, place, and social context typically do not serve as a template for another. However, guiding principles can be derived from an understanding of the past. The key lies in restoring the tattered social contract between society and academic medicine.

For the general public, there is one overarching message: academic medical centers are fragile institutions that need aggressive nurturing, sustained protection, and the unwavering support of those with vision, power, and means. The most important social functions of academic medical centers—the education of future generations of medical professionals, the discovery of new medical knowledge, the provision of highly specialized clinical services, and the care of poor and uninsured persons—are activities that are revenue-draining, not income-generating. Insurers and third party payers have traditionally helped pay for these public services, but most managed care organizations are unwilling to do so. If American medicine is to retain its future-directedness and its humanity—its investment in education and research, and its capacity to serve the sickest patients and those who can not afford to pay—specific sources of funding for the public missions of academic medical centers must be provided.

For medical educators, there is also an overarching message: external support cannot be expected without convincing demonstration that academic medical centers are serving the needs of the public. Medical schools and teaching hospitals have always existed for the community's well being, and not vice versa. Yet somehow since the 1970s, many medical faculties have forgotten this fact. If medical educators are to succeed in preserving the vitality of academic medical centers, they need to remember the admonition of Charles Eliot, a former president of Harvard University, that "the first step toward getting an endowment is to deserve one."

Medical faculties have a number of issues to address if they are to demonstrate that they are still deserving of generous public support. First, they need to adjust more fully to the new environment of resource constraints. This entails becoming leaner, more efficient, more agile, and more cost-effective in the practice of medicine. This also requires a far more effective process of long-range planning. Academic medical centers can no longer try to be all things to all people; rather, they will finally have to make tough decisions about which academic areas to pursue and which to leave to someone else. They will also have to reevaluate the optimal size of their student enrollments, graduate training programs, and faculty and support staffs. Collectively, they will even have to address the thorny question of whether the nation's medical schools and residency programs are producing too many doctors for the country's needs, and if so, how to correct the problem.

Second, medical schools need to do a better job of producing the type of doctors that the country needs. There is a distinct need to improve instruction in such areas as cost-consciousness, preventive medicine, health promotion, ambulatory medicine, primary care, the appropriate use of diagnostic tests, and the psychological dimensions of patient care. Faculties need to accelerate the effort introduce a population

perspective into medical education—that is, to teach strategies to maximize the health of a defined population (such as that of an HMO) with the resources at hand. Faculties also need to work on those factors under their control to produce a specialty mix more closely aligned with the health care needs of the country.

Third, medical faculties can demonstrate that they are serving the public interest by regaining the critical initiative in monitoring and maintaining the quality of care, which in the view of many observers has been eroding for over a decade. The answer to preserving quality is not open-ended spending. Rather, the intellectual elite of the profession need to provide guidance regarding how to use resources wisely. If academic and professional leaders can speak in a unified voice about what is best for patients, a powerful force for the public good could be released.

Lastly, medical faculties need to make clear that their research interests are fully concordant with the health concerns of the public. In an era of chronic diseases and an aging population, this means integrating the study of the organization, financing, and delivery of health care with traditional scientific work. All the rich intellectual resources of the university could be called upon to assist in this effort. Of course, something as large and complex as the health care delivery system is not the sole responsibility of academic medicine to fix. However, the problems of promoting health and organizing health care in the United States have become so pressing that they deserve much more attention from medical schools than they have traditionally received. Certainly, rapid evolution of the country's health care system is going to continue with or without the involvement of medical educators, but without their participation, they and the public are less likely to be satisfied with the results.

Though imposing, these challenges are not as daunting as they might seem at first glance. There are many reasons to be optimistic, and the challenges of maintaining a strong system of medical education are not as great as those of creating the system a century ago. At the start of the twenty-first century the public is already accustomed to supporting medical schools generously, the capacity of medical care and potential of medical research are widely recognized, the public is expressing its belief in medicine by spending over a trillion dollars a year on health care, considerable national goodwill toward the medical profession remains, the public is realizing that managed care needs significant improvements, and the majority of physicians retain a conscience and a deep-seated sense of service. These represent major advantages not available to the pioneering medical educators and create genuine hope that the social contract might be restored. At the present moment, the time available to do so is shrinking—but there is still opportunity for visionaries to dream, for men and women of good will to stand up for principle, and for leaders to act.

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