

Presidential address

Meeting the Challenges to Neurosurgical Education

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I thank the members of the Congress for the honor and privilege of serving as your President. I am very pleased to have with us today two of my teachers, Dr. Henry Schwartz and our honored guest, Dr. Sidney Goldring. I acknowledge my great debt to them and also to Drs. William Coxe and Frank Nulsen. These gentlemen have served as exemplary models for a generation of neurological surgeons and have inspired the theme of this talk: the responsibility of teachers of neurosurgery to their students.

Neurosurgery, although practiced and taught by masters, is always practiced and taught by students. We remain far from our goal of perfection, and our scholarship is never finished. In this regard, the purpose of the Congress of Neurological Surgeons—the education of present and future generations of neurological surgeons—is shared by all who practice our specialty.

Through the efforts of the American Board of Neurological Surgery, the Residency Review Committee, The Society of Neurological Surgeons, and the Joint Committee on Education of the AANS and CNS, neurosurgery has developed an effective and dynamic system of graduate medical education. However, today we are being asked to make changes, not for the purpose of improving the educational process for the benefit of society, but solely on the basis of economic considerations. How did this come about? I will review the challenges that face modern neurosurgical education and provide one perception of the historical events that have spawned today's challenges.

The medical profession differs from other occupations in part by its ability to set its own rules and standards. This became possible when members agreed upon criteria for belonging to the profession. Paul Starr points out in his book, *The Social Transformation of American Medicine*, that the development of medical education was retarded in the early 19th century by mutual hostility among practitioners, intense competition, differences in economic interests, and sectarian antagonism (12). These differences prevented mobilization of the profession for collective action or to influence public opinion. In 1893, the Johns Hopkins Medical School set rigid standards for medical education, requiring all entering medical students to have college degrees, and outlined a 4-year program based on the concept that medical education is a field of graduate study rooted in basic science. This marriage of science and research to clinical hospital practice revolutionized American medical education.

In 1904, the American Medical Association (AMA) formed a Council on Medical Education to elevate and standardize

educational requirements. It required 4 years of high school, 4 years of medical school, and a licensing test (12). These actions, along with the Flexner Report of 1910 and the increased length of medical education demanded by state licensing boards, greatly influenced who attended medical school. Increasing the academic year from 4 to 9 months raised tuition costs. Lengthening training to 8 years after high school prevented anyone entering the field from making a living much before the age of 30. These changes effectively eliminated proprietary medical schools and limited enrollment.

The standardization and lengthening of medical education helped the profession gain favorable public opinion. Doctors related to patients as healers and benefactors. They gave care according to the needs of the sick and regulated fees according to the ability to pay. Physicians' economic security was not assured, but they could dictate their own practice conditions.

Before World War II, scientists opposed federal financing of research, which at that time was supported by private foundations and universities. After the war, medical research gained priority. A budget of 4 million dollars in 1947 grew to 400 million dollars by 1960. Despite prewar concerns, science remained free from pressure groups and the need to produce immediate practical results. This was a time of immense growth in the medical establishment. From 1950 to 1970, the medical work force increased from 1.2 to 3.9 million people and health care expenditures grew from 13 to 72 billion dollars. Medical developments emphasized research, sophisticated technical development, and hospital construction, but the distribution of medical services was not addressed until the mid-1960s.

Although government money for research was sought after, organized medicine held a different attitude toward aid to medical education. In 1949, Congress favored grants to increase the number of physicians, but AMA opposition allowed critical legislation to die. During the 1950s, funding for research aided medical school growth and enrollment enough to keep pace with population growth, but not with the increased demand for medical care.

At the same time, academic medicine was undergoing radical changes. In the 1920s and 1930s, faculty promotions had been slow and uncertain. Research money was scarce. Grants from the National Institutes of Health (NIH) changed that. They supported new centers and provided stipends for large groups of investigators. Specialties grew, allowing more individuals to rise to senior posts. Funds were primarily directed toward expanding internal medicine faculties. Stu-

dents began entering specialties in increasing numbers, and hospitals found it advantageous to have residency programs. House staff provided inexpensive professional labor, night and weekend coverage, and more thorough evaluations of patients. Hospitals expanded, and there was competition for staff. The number of residency positions grew from 5,000 in 1940 to 25,000 by 1955. Unfilled positions increased. In 1957, there were 12,000 internship positions and only 7,000 American graduates (13). This shortage was one reason for increasing the number of medical students and ultimately led to eased governmental restrictions on foreign medical graduates who, by 1960, comprised 26% of house staff.

In 1959, nonuniversity hospitals provided 13% of the approved residency training programs. Unable to recruit house staff competitively, these institutions sought medical school ties. By 1970, less than 10% of residencies were offered in unaffiliated hospitals.

A 1959 government report estimated that, to keep up with population need, the number of medical students should increase from the current 7,400 to 11,000 by 1975 and recommended even greater expansion to meet the demand for service, research, and teaching. This need became widely accepted. As medical care became more costly to the individual and society, recognition grew that whoever paid the cost of illness received the gratitude and goodwill of the sick and their families. This realization created a powerful incentive for government and other institutions to intervene into the economics of medicine. In 1963, Congress initiated measures to expand education in the health profession. Lyndon Johnson's Great Society speech supporting Medicare made a crucial issue of providing money for the training of health professionals. In 1964, Medicare was introduced. It soon evolved from a program of compulsory hospital insurance to one that included government subsidization for physician bills and expanded assistance to states for medical care of the poor. Despite physicians' initial protests and boycott calls, within 1 year Medicare was firmly established. Doctors discovered it to be a bonanza.

Part A of Medicare paid direct patient costs—plus depreciation—thereby favoring hospitals with the newest and most expensive facilities. Although in the 1970s some inequities remained, access to care improved for the poor. The Federal Government's desire to launch these new social programs created financial incentives (for both hospitals and physicians) that were probably irresponsible and poorly conceived. Starr describes this as a policy of accommodation (13). Growth had continued haphazardly and, by the late 1970s, many believed that reorganization was necessary. Today, it seems that government, doctors, and hospitals will pay the price for the lack of economic reality in the original planning.

In the 1970s, there was a loss of confidence in the method of practicing medicine. It no longer was accepted axiomatically that Americans needed more medical care or that physicians and private voluntary institutions were best qualified to decide how to organize services. The public's attention shifted from scientific progress to economic problems, and public loyalty switched from providers to payers. The physicians' image of affluence generated little public sympathy. In a setting of enormous cost increases, uncertain benefits, and unchecked excesses, the government intervened. We now face a medical system geared to expansion and a society and state demanding control over medical expenditures.

In neurosurgery, graduate medical education occurs in teaching hospitals, where the cost of medical care is significantly higher than in nonteaching hospitals (3). Real costs associated with education include salary for residents and

supervising faculty, clerical support, physical facilities, lowered productivity, and increased use of ancillary services. Teaching hospitals are located in urban settings with higher personnel costs. To retain teaching as we know it, these costs cannot be avoided.

Teaching hospitals perform other critical functions closely related to medical education, such as charity care. The 335 institutions of the American Association of Medical Colleges (AAMC) Council of Teaching Hospitals represent 5.8% of the nation's community hospitals, 17.7% of all admissions, and 31.5% of the bad debts. In 1981, these 335 hospitals rendered 51% of the nation's charity care (4). In general, they serve the most severely ill patients, provide regional standby services such as transplantation and burn units, and carry on clinical research efforts to advance diagnosis and treatment. These increased costs have been financed primarily by patient service revenues consistent with private payer practices and the clearly established Congressional intent for Medicare. These hospitals provide the majority of the nation's residency training. Receiving the benefits of fully trained physicians—without incurring the costs of training them—are 4600 hospitals, health maintenance organizations (HMOs), competitive medical plans, and preferred provider organizations. These nonteaching hospitals have an advantage in negotiating contracts with payers, whose primary interest increasingly is the cost of the medical care that they subsidize. Teaching hospitals simply cannot compete on a price basis when third party payers and health care plans favor hospitals with low charges. They will be severely jeopardized as payers withdraw support. A system of medical reimbursement is evolving in which the payer only pays for immediate service, predetermined payment replaces cost reimbursement, or the criterion for hospital selection is lowest price. Teaching hospitals will find it more difficult to incorporate the cost of education into the cost of patient care.

Currently before the Senate is a bill that limits federal funding for graduate medical education to 5 years and mandates preferential support for primary care trainees. If passed, the legislation would soon influence the policies of Veterans Administration hospitals and private payers. The growing number of HMOs will go to the lowest bidder. The high cost of the teaching hospital will mitigate participation in this form of care provision unless the hospital owns the HMO and is willing to run it at little or no profit. This legislation threatens to destabilize some outstanding neurosurgical training programs. Already beleaguered teaching hospitals may be asked to use professional fees, faculty/clinical income, endowments, gifts, or surplus income to support residents in specialties such as neurosurgery (8). This plan would encourage hospital administrators to determine the need and appropriateness of training programs.

Plans should be developed to meet the pressures that will alter methods of graduate medical education, or at least payment for it. However, plans that force teaching hospitals to alter programs, cut back on residents or faculty, or decrease care to the indigent are not appealing. Ideally, payers would subordinate their self-interests to a broader social or ethical interest. Another alternative would be for society to impose a tax, theoretically allowing teaching hospitals to become competitive, but this would subject medical education to the uncertainties of annual congressional debate. Our charge is to avoid a decrease in quality of care and educational ability and to avoid providing different levels of care at a time of decline in physician influence, autonomy, and prestige.

Neurosurgical graduate education relates to the economic issues described. The origins of modern neurosurgery can be

traced to a dedicated group of innovative scientific practitioners. Chiefly through the efforts of Harvey Cushing, the establishment of neurosurgery as a specialty attracted a select group of young men to this new and exciting field. That they must have been of a different breed is without question. In his history of the Society of Neurological Surgeons, Ernest Sachs lamented how difficult it was to find courageous young men who would consider entering the discouraging field of neurosurgery. He described craniotomies performed without tumors being found and the need to keep a stiff upper lip (11). Yet courageous men were found; many initially served Cushing for a year and then moved on to plant the seeds of this fledgling specialty in their own students. Training requirements were informal, as was acceptance in a training program. The field grew, and certain individuals became prominent educators. Among them were Sachs, Peet, Adson, Bailey, and later Penfield.

In the late 1930s, the need for a certifying board became apparent. In October 1940, the American Board of Neurological Surgery held its first official meeting. Fifty neurosurgeons were certified without examination on the basis of holding professorial rank as neurosurgeons in the United States or Canada. Twenty-four candidates were examined. Although one of the founding members, Dr. Paul Bucy, assured me that these individuals were chosen because they would surely pass the examination, three failed. There can be no doubt that the Board started on a firm and fair basis.

In 1942, the Board published the requirements necessary to become certified: graduation from an approved medical school, 1 year of surgical internship, and a period of study in neurological surgery of not less than 3 years (2). This training was designed to emphasize the relationship of the basic sciences to neurological surgery. In 1946, the Board began to accredit hospitals and institutions for neurosurgical training. It set requirements and supervised the selection and evaluation of residency programs. In 1950, the Board required progressive responsibility for trainees, prompting some programs to become associated with so-called "charity" hospitals where independent surgical experience could be obtained. In 1954, the Board established the Residency Review Committee (RRC) with representatives from the Board and the AMA. Actions of the RRC were subject to ratification by the Board, which continued to prescribe training requirements for certification and, in 1955, increased the length of training to 4 years.

Because of perceived Federal Trade Commission pressures, in the late 1960s the AMA and the American College of Surgeons advocated a tripartite Residency Review Committee (RRC). During the early 1970s, the AMA Liaison Committee on Graduate Medical Education (LCGME) gained the power to override the actions of the Board and the RRC. In 1980, the LCGME approved new special requirements that increased the period for certification to 5 years. In general, the accreditation mechanism through the Liaison Committee proved unsatisfactory; from it evolved the Accreditation Council on Graduate Medical Education (ACGME). Thus, accreditation of neurosurgical residency training passed from the American Board of Neurological Surgery to the RRC as delegated by the ACGME (1). In 1985, the RRC enacted new plans for program evaluation that emphasized objective data and the educational environment of a program.

From an informal setting of early preceptorships, the neurosurgical residency program has developed into a structured period of training designed to meet the needs of the trainees. Today, the number of residents in a program is determined on the basis of clinical resources. Despite complicated legal

issues, I believe that the next major change should be to prohibit independent practice before board certification. Presently, active programs involving issues of academic policy; resident training, selection, and evaluation; ethics; and research are being pursued by the Society of Neurological Surgeons and the Graduate Education Committee of the Joint Committee on Education. These organizations remain dedicated to improving the quality of neurosurgical training and its product.

Today, there are new problems for neurosurgical education. Presently, many academic medical centers are in direct competition with community hospitals and other academic institutions. They are involved in price wars where discounts are given for elective surgery (7) and cash payment. Doctors receive bonuses for changing hospital affiliations and admission patterns. Prospective payment encourages more and shorter hospitalizations. Third party payers insist upon same day testing or operation, a practice that may endanger some patients and that certainly denies house officers the opportunity to evaluate these patients, make preliminary decisions, and present well-thought-out treatment plans. If, as it seems, we cannot reverse this trend, then, by changing the traditional role of house officers from purely in-patient contact and by integrating them earlier into the evaluation and decision-making process, perhaps we can avoid presenting trainees with a body for which their only obligation is rapid preparation for operation.

Cost containment cannot be allowed to destroy our standards. Just as society must recognize and support the special contributions of teaching hospitals, there must be special consideration for the support of education. It has been suggested that neurosurgical programs should fund residencies. Most already do so, particularly for laboratory years. Academic neurosurgeons gain significant benefits from their association with residents, but not in the realm of personal financial reimbursement. Academicians are subject to malpractice insurance costs and, because of the patient mix, may be more vulnerable to suit. They support the dean's office and faculty practice plans. Residents desiring to pursue academic careers frequently require additional training, paid for by the residency program. Increased competition for NIH funds has forced programs to bear expenses before—or between—grants to maintain a suitable academic environment with an ongoing laboratory program and security for laboratory workers and technicians. In some instances, patient care facilities not provided by hospitals have been provided by training programs without Medicare reimbursement. Resident expenses such as meeting attendance, manuscript production, library maintenance, and computer resources are factors that seem not to be appreciated by some legislators and primary care advocates.

No one can deny the wisdom of public support for the education of future practitioners and researchers. Our training programs will have the most important influence upon the quality of future medical care. They will provide knowledge, skills, and standards of practice. Complex and new technology will be investigated and first applied and community responsibility will be taught to young physicians in our training programs. There they will learn that our profession is unforgiving and that shortcuts are unacceptable for the purpose of personal convenience, decreased operating room time, or economic advantage for the physician, hospital, or patient. Training programs have the unique responsibility to educate and train tomorrow's neurosurgeons. This alone is the reason for their existence.

Just as society cannot allow legislative and economic con-

siderations to impinge upon our ability to educate future neurosurgeons and to affect the quality of those who enter our field, it cannot afford to keep residents out of research laboratories. To me, it is inconceivable that residents would not be exposed to the scientific method, which is best taught in the laboratory. The development of all fully trained and critically thinking neurosurgeons should include opportunities for research. Governmental proposals to eliminate research from graduate medical education lack a sense of responsibility for the development of individuals who later will be the leaders in improving health care and scientific knowledge. Despite the contributions of residency programs, decreased federal funding for graduate medical education will affect residents' laboratory opportunities, participation in clinical protocols, and research carried out in conjunction with inpatient care. The financial stress placed upon teaching hospitals will deter cooperative research with industry and the development of new and expensive technology because installation costs, protocols, and technicians are often supported by the hospital.

The support of teaching hospitals as the major site of technological development is a reasonable expenditure in the form of indirect medical education costs. In many instances, the expense will be repaid to society in the form of cost-effective technology and improvement in the quality of care. Research experience is a vital part of the educational process, and there is no worse alternative than to stop it. Industrial research and development is recovered per unit of service. There is no logical reason that a hospital should not be allowed to recover its cost for "R&D,"—which is performed for society's benefit—from patient care dollars. Funding from commercial sources has its dangers, particularly as it relates to directed research at the expense of basic research. Proprietary hospitals are not an answer; profits from these institutions will support traditional academic interests only to a limited contractual extent, and the real profits will revert to investors.

Medicine faces challenges because of societal change. Our role is to provide what society demands. I do not believe that society desires an industrial approach to medical care and the education of neurosurgeons. We are dealing with the future of the world's best health care system—one that has developed because of its educational excellence. The teaching hospital with its missions of patient care, education, and research must be protected. The use of tax dollars toward this end is most appropriate and, therefore, we are obliged to communicate clearly the importance of what we are trying to do.

Corporate medicine is developing. HMOs and investor-owned companies are growing rapidly, and nonprofit groups claim that their aggressive tactics are necessary for survival. As Arnold Relman has pointed out, health care—both for profit and nonprofit—is now marketed and sold like any other commodity instead of being a service provided by dedicated people as one of civilization's critical social functions (10). Today, 35 million Americans are without any type of hospitalization insurance (9). If health care is distributed by income, people who cannot afford care will be denied access or dumped by both profit and nonprofit hospitals into fewer and fewer hospitals, mainly underfunded public hospitals.

If trends continue, large companies and hospital-based HMOs will set the conditions under which we work and care is delivered. Economic power may influence our profession's values and ethics. The physician may become either the captive or the partner of a corporation with direct impact on the quality of care delivered. No matter how good the equipment or how well technically trained the doctor, I see no place

for graduate medical education in neurosurgery in this type of setting. I share Relman's repulsion at the concept of the physician businessman and medical entrepreneurs who profit from decisions made about their patients. Residents must be taught, by example, that their obligation is to care for all patients.

Institutions cannot easily ignore the impact of economic reality, but physicians and students retain personal choices. The educator must be wary of actions performed in the name of competition. If there is to be competition, let it be on the basis of quality not on the basis of physicians exploiting the media's desire for sensationalism by having the common appear extraordinary or by turning a patient's good fortune into outlandish claims of individual or institutional excellence. The blame cannot be placed on the public or on the marketplace. It belongs squarely on the shoulders of hospitals and physicians who seek to gain from publicity. Certainly, the academic physician, who may have greatest access to the press, must not fall prey to the "me too" era of competition among increasingly profit and publicity-oriented health care institutions. Even at some of our finest academic institutions, human experimentation has been exploited and has taken on the atmosphere of a freak show. Competition, advertising, and promotion are poor examples for future neurosurgeons.

I believe that the mood of the public will change. Patient dissatisfaction with healing institutions that base care and relationships on finances, instead of individual dignity, will eventually awaken society to the effects of cost containment and prospective payment. Our responsibility during this time is to maintain our educational values intact so there will be no danger of their being lost. Patient care and medical research cannot be separated. Training programs must have funds available for education and research. Teachers alone must set the standard of practice for themselves and their trainees. They must be allowed to remain independent and to resist contemporary temptations.

In Longfellow's poem, Robert of Sicily is told by the angel that he can have his former glory if he pays the angel his due (6). At a time when successful training programs must provide technical skills in neurosurgery through a busy clinical practice, encourage high technology research, and maintain smooth interaction with hospital administrators, it will be necessary to pay homage only to the angels if we desire to retain our glory. Longfellow did not tell what happened to Robert of Sicily, but I am afraid that today's external forces are not the angels, and submission will not lead to an era of scientists and neurosurgeons dedicated to the advancement of our field. Sir Jeffrey Jefferson described Cushing as being "lucky" for being appointed to one of the great chairs in surgery from the age of 43 on—able to do as he pleased with ample facilities and great authority (5). I was unable to determine to which angels Cushing paid homage, but I believe it important that we continue to learn from our forebears—not just to keep tradition, but because these men were brave, innovative, and uncompromising workers and investigators whose contributions were for the general benefit of the public.

A neurosurgical graduate educational system that has evolved through innovation must be allowed to evolve further so that it may respond to the needs of society. It is our responsibility to see that these needs are met in a single tier system that is free from the financial pressures of outside agencies and the financial aspirations of its practitioners. Future generations of neurosurgeons must be allowed the same opportunities as past generations. A neurosurgeon is a scientist, and science cannot flourish in an atmosphere of constraint brought about by outside influence, prescription,

and protocols. Half a century ago, Cushing spoke against the concept of the neurosurgeon as a plumber or carpenter operating at the bidding and instruction of the master nonsurgical brain (5). Today, our educational system faces the same threat. Neurosurgery should not function in response to bureaucratic demands, but within itself must design the future of its educational process. Residents must be isolated from the financial dictates of hospital administrators and bureaucrats who have little knowledge of or concern about the unique demands and challenges of our field. We must take our case to the community so the public can understand that the issues of quality care and quality medical education are inseparable. Neurological surgery represents one of civilization's finest efforts and remains an active and dynamic battle.

It has been said that, when pessimism is in vogue, a belief in progress sounds dated. At the risk of appearing dated, we should remember that our history is one of progress. However, progress is interrupted when human beings submit to their own limitations and those imposed by the world about them. Perhaps our rise will be temporarily interrupted, and there may be some pessimism for the short run. In fact, there may be problems beyond our solving. Yet for the long run, neurosurgery will continue upward. In the words of John Trotwood Moore, "it is only the game fish that swims upstream."

ACKNOWLEDGMENT

I express my gratitude to my wife, Peggy, for her help and insightful comments during the preparation of this manuscript and to Ms. Jean Jensen, who tirelessly prepared its many drafts.

Presented at the 35th Annual Meeting of the Congress of Neurological Surgeons, Honolulu, Hawaii, September 30–October 4, 1985.

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