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ABSTRACT

Changes in the system for the delivery of health care constitutes a challenge for U.S. academic medical centers (AMCs), which are being called on to produce physicians who can function effectively in the 21st century. This paper discusses issues facing AMCs and suggests some steps that might be taken to deal with the challenges these issues present. There is considerable evidence that the demand for physicians is decreasing as the United States moves from a delivery system based on fee for service to one based on managed care. In addition, there is an oversupply in many specialties, and the oversupply of specialists seems likely to last for many years. Other problems are faced by the geographic and racial maldistribution of physicians. Minorities are still underrepresented in the physician workforce. Still another issue is the concern that current medical education and training programs are not preparing physicians adequately for practice in a health care setting dominated by managed care. The numbers and types of physicians needed in the future will be influenced heavily by developments occurring in other segments of the health care industry. Some steps are already being taken to address some of these issues. Many medical schools are revising their curriculums to incorporate items of importance to managed care. There is also some optimism that the problems of physician oversupply will be addressed in the near future and Congress has requested that the Institute of Medicine develop some options it can consider in revising Medicare graduate medical education programs. (Contains 36 references.) (SLD)

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Forum on the Future of Academic Medicine

The Physician Workforce: Issues for Academic Medical Centers

Prepared by Neal A. Vanselow M.D., Professor of Medicine and Adjunct Professor of Health Systems Management, Tulane University Medical Center, New Orleans, LA for the Forum's first meeting (December 2, 1996).

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Introduction

Dramatic and fundamental changes are taking place in the U.S. health care delivery system as a result of market forces and efforts to reduce health care costs. Because the "new" system is still evolving, it is difficult to predict what it will look like when a period of stability is reached. It seems certain, however, that it will require a physician workforce that is considerably different from the one existing today. Delivery system change constitutes a challenge for the nation's academic medical centers (AMCs) which are being called upon to produce physicians who can function effectively in the 21st century. The issues facing AMCs include:

- how many and what types of physicians should be trained?
- what new knowledge, skills, and attitudes must education and training programs instill in young physicians to enable them to practice in a system which most likely will be based on managed care?maldistribution by specialty
- what developments in the non-physician segment of the health care workforce will affect physician practice and require attention by medical educators and training program directors?

The purpose of this paper is to discuss these issues and, where possible, suggest steps that might be taken by AMCs and other organizations to deal with the challenges they present.

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The Aggregate Physician Supply

All of the major studies of the physician workforce done in the past 15 years have concluded that the U.S. faces a physician surplus. The 1980 adjusted need-based study of the Graduate Medical Education National Advisory Committee (GMENAC) predicted that the nation would have a surplus of 70,000 physicians in 1990 which would increase to 145,000 by the year 2000.(1) GMENAC forecast a surplus in most specialties and relative balance in the generalist disciplines of family practice, general internal medicine, and pediatrics. In several of the reports it has published since its creation in the mid 1980s, the Council on Graduate Medical Education (COGME) has predicted a physician oversupply. For example, in its Seventh Report, published in 1995, COGME estimated an overall surplus of 105,000 physicians for the year 2000, comprised of an excess of 125,000 specialists and a modest shortage of 20,000 generalists.(2) Weiner, employing a method which extrapolated physician staffing patterns in managed care to the delivery system as a whole, concluded that there will be an overall surplus of 163,000 physicians by the turn of the century.(3) He predicted that the supply of generalists would be in near balance with requirements but that the supply of specialists would exceed requirements by approximately 2/3. The Institute of Medicine (IOM)(4) and the Pew Health Professions Commission(5) have also predicted a physician surplus.

Projections of a physician surplus are based on two major trends: increases in the physician supply in relationship to population; and, a decreasing requirement for physician services as a result of the growth of managed care. For the past two decades, the U.S. physician supply has been growing at a rate one and one half times as fast as the growth rate of the population at large.(6) In 1970 there were just over 150 active physicians per 100,000 population.(7) By 1992 this ratio had grown to 245/100,000.(8) If current trends continue, COGME estimates that it will reach 298/100,000 by 2020.(6)

Another factor influencing the U.S. physician supply is the annual 4% increase in the number of residents in training. This is not the result of an increase in the number of graduates of U.S. allopathic and osteopathic medical schools (USMGs), which has been fairly constant at approximately 17,500 per year. It results almost entirely from annual increases in the number of international medical graduates (IMGs) in U.S. residency programs. Between 1988 and 1993, the number of IMGs in U.S. graduate medical education programs (GME) rose from 12,433 to 22,706 - an increase of 80%.(9) IMGs now constitute approximately 25% of U.S. resident physicians. Seventy-five percent of the IMGs who train in this country remain here to practice.(9)

While the physician to population ratio increases each year, there is considerable evidence to indicate that the demand for physicians is decreasing as we move from a delivery system based on fee for service to one based on managed care. Although the required number of physicians per 100,000 enrollees varies considerably from one managed care organization to another, most studies have shown that managed care uses fewer physicians that the traditional U.S. delivery system. Weiner(3), for example, projected that, given comparable populations to serve and correcting for out of plan use, staff model health maintenance organizations (HMOs) would use 146 patient care physicians/100,000 enrollees and IPA model HMOs would use 124 patient care physicians/100,000 . Both figures are considerably below the 1992 U.S. physician supply of 180.1 patient care physicians/100,000.

Maldistribution by Specialty

As previously noted, the three major physician workforce studies done in the past 15 years have concluded that the overall physician surplus is due almost exclusively to an oversupply in many of the specialties and subspecialties. There has been more controversy about the adequacy of the generalist supply. While the GMENAC and Weiner studies predicted that it would be in approximate balance with requirements, the early COGME reports spoke of a shortage of generalists.(10,11) More recent COGME reports, however, have predicted a generalist supply in the lower part of the desired range of 60-80/100,000.(12) The IOM Committee on the Future of Primary Care concluded that the nation currently has a modest shortage of primary care clinicians but that this shortage may disappear in the near future.(13) It recommended that the current level of effort to increase the supply of primary care clinicians be continued but did not believe new efforts were indicated.

Any steps taken by GME programs to alter the current U.S. physician workforce distribution of approximately 2/3 specialists and 1/3 generalists will take many years to be effective. Two recent analyses(14,15) have demonstrated a time lag of between 40 and 50 years between the initiation of a change in the composition of residency or fellowship training programs and the time that change is manifest in the physician workforce as a whole. For example, if it were possible today to increase the percent of resident physicians in generalist programs from its current level of 30% to 50%, it would take until the year 2040 to produce a physician workforce comprised of 50% generalists. It is apparent therefore that, barring a massive effort to retrain specialists to deliver primary care -an effort that seems unlikely- the oversupply of specialists will be with us for many years to come.

Marketplace Evidence of Oversupply

Until recently, most of the market evidence of a physician oversupply consisted of anecdotal reports from states like California of empty physician office calendars, early retirements, and physician emigration. This has changed in the past few years.

One would expect that a physician oversupply would cause practitioner incomes to drop. Although the evidence is mixed, several recent reports have indicated that physician incomes are indeed falling or at best remaining flat.(16-19) A study by the American Medical Association's Center for Health Policy Research, for example, has shown that 1994 median nonfederal physician net income declined by 3.8% from 1993- the first drop ever recorded by this annual survey.(20) Several of the reports also show that while the income of generalists is still below that of most specialists, the gap is narrowing.

A recent study suggests that physicians completing residency training in some specialties and some areas of the country are having difficulty finding full time employment in their specialty or subspecialty. Miller et. al. surveyed 3090 residency program directors to determine the employment status of residents who had completed their training during the 1993-94 academic year.(21) The survey showed that approximately 10% of those in pathology and plastic surgery and over 5% in several internal medicine subspecialties had not found full time employment by the first six months of 1995.

A tightening job market for physicians is also indicated by a decrease in the number of physician positions advertised in medical journals. Seifer et. al.(22) found that the number of job

advertisements for specialists peaked in 1990 and has declined steeply since then. In the *New England Journal of Medicine*, for example, between 1990 and 1995 there was a 55% decrease in the number of specialist positions advertised . In contrast, the number of positions for family physicians advertised in *American Family Physician* more than doubled during the same time period.

Geographic and Racial Maldistribution

Two other problems that have plagued the physician workforce for years are the geographic and racial maldistribution of physicians.

A shortage of practitioners in rural America and in the nation's inner cities continues in spite of an overall physician surplus. This problem has been widely discussed and has been the target of numerous remedial programs. Unfortunately, it has been resistant to solution. One potentially encouraging development, however, is anecdotal information suggesting physician emigration from oversupplied areas of states such as California to rural states like Montana and Idaho. More data will be required to determine whether the physician emigres are settling in the rural areas of these states or are merely crowding into the larger towns and cities.

Another possible solution to the problem of geographic maldistribution is the potential that integrated delivery systems will eventually move into the rural and inner city areas and will develop an efficient and rational system of care to replace what often has been an uncoordinated array of small hospitals and practitioners.

Maldistribution of U.S. physicians by race has also been a persistent problem. African-Americans, Hispanics, and Native Americans are still underrepresented in the U.S. physician workforce despite several decades of effort to increase their numbers.

The Adequacy of Physician Education and Training

There is concern that current medical education and training programs are not adequately preparing physicians for practice in a health care setting dominated by managed care.(23) These findings were supported by information the IOM Committee on the Future of Primary Care obtained during the site visits and public hearing it conducted as part of its two year study.(13) The committee heard consistent complaints from managed care organizations that the new physicians they hired had received too much of their training in inpatient settings and not enough in an ambulatory setting. Other complaints from managed care included lack of knowledge of health promotion and disease prevention, poor communication skills, poor time and resource management skills, inexperience in functioning as a member of an interdisciplinary team, lack of exposure to information systems, and poor referral skills. Additional areas of criticism were residents' lack of exposure to dermatology, office orthopedics, office gynecology, ophthalmology, and behavioral medicine.

One explanation for the relative inability of young physicians to perform well in a managed care environment is their lack of exposure to managed care during medical school and residency. In part this is the result of the reluctance of managed care organizations to participate in medical student or residency education programs because of the inefficiencies in patient care they are

perceived to produce. Another factor may be that medical schools and residency programs are using inappropriately those managed care experiences that are available. Veloski et. al.(23) found that in 1995 and 1996 an average of only 16 medical schools required their medical students to take clerkships or other clinical experiences in a group/staff model HMO. Some students from another 46% of medical schools spent time in an HMO for clerkships or physical diagnosis/ introduction to clinical medicine experiences. In many cases, however, the type of experiences received in the HMO did not specifically address features emphasized by managed care such as cost containment and disease prevention.

Workforce Developments in Other Parts of the Health Care Industry

The number and types of physicians required in the future and the role they play in the delivery system will be influenced heavily by a number of developments occurring in other segments of the health care industry. These include the growth of other health professions, changes in the roles assigned to various health professionals, and changes in the organization of work in health care institutions.

Considerable growth is taking place in the size of several non-physician segments of the health care workforce. The number of actively practicing physician assistants is expected to grow from 23,350 in 1994 to between 37,500 and 42,000 by the year 2000.(24) While it is more difficult to find accurate data on growth in the numbers of nurse practitioners and other advanced practice nurses, it is clear that both the number of nursing education programs offering an advanced practice option and the number of advanced practice nursing graduates is increasing. Between 1992 and 1993, for example, the number of nursing masters degree programs offering a nurse practitioner option increased from 108 to 136 - a 25.9% increase in a single year. In the same twelve month period the number of graduates from masters programs in nursing increased 7.3%, from 7345 in 1991-92 to 7882 in 1992-93.(25) There is also significant growth in the "alternative non-physician provider" disciplines of chiropracty, naturopathy, and oriental medicine. One estimate is that the number of practitioners in these disciplines will to grow from 59,000 in 1994 to 132,000 in 2010.(26) The scope of practice of many of these non-physician providers overlaps with that of physicians, particularly in the field of primary care where nurse practitioners and physician assistants claim they are capable of doing 80% of what a physician does.

The potential clash between the role of the physician and that of other health professionals is further illustrated by the situation in pharmacy. A number of developments including the use of pharmacy assistants, drug dispensing robots, the growth of mail order pharmacy, and the use of pharmaceutical benefit managers by employers and managed care organizations, has threatened to put the community pharmacist out of business. As a profession, pharmacy is responding to this pressure by emphasizing the role of the clinical pharmacist and promoting the concept of "pharmaceutical care." Although there is some disagreement within pharmacy as to what the latter encompasses, it is clear that it would give pharmacists a much more important role in drug therapy than they now have. At least one author has also suggested that pharmacists might expand their role in the delivery system by serving as primary care practitioners(27).

Perhaps the most significant change for providers as health care moves from a cottage industry to one based on integrated systems of care is the reduction of barriers between the health professions. This affects all components of the workforce. Two principal features of the classic concept of "professionalism" are autonomy and possession of monopoly over a unique or almost unique body of knowledge. Berwick(28) has emphasized that health care developed historically

in a series of professional and organizational categories that emphasized functional specialization. In the "traditional" health care system, distinctions among professions attracted more attention than areas of interdependence. These distinctions and barriers are disappearing as delivery systems strive to become more efficient and as licensure laws are modified to expand scopes of practice. In the evolving system there is both less exclusivity of mission and greater interdependence among health professionals. Three developments that reflect this trend are the increasing use of interdisciplinary teams, personnel substitution, and, cross-training to develop multiskilled health care workers.

Managed care increasingly is organizing its patient care workforce into interdisciplinary teams, especially for the delivery of primary care. The IOM Committee on the Future of Primary Care observed such teams on a number of the site visits it made to both urban and rural areas. In large metropolitan areas, the teams usually included physicians, nurse practitioners and/or physician assistants, registered nurses, and a variety of other personnel such as nurses aides and medical assistants who had only on the job training. They might also include clinical pharmacists, nutritionists, social workers, and physical therapists. In the rural areas the teams were much smaller and consisted of physicians, nurse practitioners and/or physician assistants, and registered nurses. While a physician usually served as the team captain or team coordinator, this role was conducted informally without evidence of a rigid hierarchical structure. A team consisted of a group of health professionals who knew each other's capabilities and worked together to provide care to a defined population of patients. The primary caregiver for some patients might be a nurse practitioner, physician assistant, or registered nurse. Physician members of the team were often called upon to function as "managers" of a pool of personnel resources and, as a result, provided less direct care themselves.

Related to the team delivery of patient care is the phenomenon of substitution. This was a striking feature of managed care organizations visited by the IOM Committee on the Future of Primary Care. Simply defined, it is the substitution of personnel with less education and training for those with more education and training. Managed care is experimenting with substitution in an attempt to reduce costs and use personnel more efficiently. Tasks are assigned to those workers with the least amount of education and training needed to perform them safely and effectively. In some managed care organizations in advanced stage markets like Minneapolis-St. Paul, registered nurses are managing anticoagulant therapy and are also managing the majority of uncomplicated urinary tract infections in women. There is relatively little in the medical literature on substitution. Schwartz, however, has expressed concern that the market is rapidly implementing new forms of health care delivery with broad workforce substitution without any formal or rigorous evaluation of their safety or efficacy.(29)

While cross-training or multiskilling of health care workers does not involve physicians directly, it represents another example of the blurring of distinctions among health professionals. The multiskilled health practitioner is a person who is cross-trained to provide more than one function, often in more than one discipline.(30) Combined functions can be found in health related positions occupied by both professionals and non-professionals. Multiskilling is being used by hospitals and other health care organizations to enhance employee productivity and reduce costs. An example is a registered nurse who, in additional to her traditional duties, is trained to perform basic physical and respiratory therapy and take electrocardiograms.

Recent Proposals for Change

Recent reports have recommended steps to deal with several of the issues facing the physician workforce. Two of these reports were issued by the IOM and a third by the Pew Health Professions Commission.

The IOM Committee on the U.S. Physician Supply(4) concluded that the nation now has an abundant supply of physicians and that the increase in the number of physicians in training and entering practice each year is sufficient to cause concern that there will be an excessive supply in the future. It also concluded that a physician oversupply was not necessarily beneficial in terms of decreasing health care costs, improving the quality of care, or increasing access to care. Further, the committee felt that producing more physicians than the nation required was both a waste of human resources and a waste of federal resources spent on GME.

The IOM report recommended that no new schools of allopathic or osteopathic medicine be opened and that class size in existing schools not be increased. While the number of allopathic medical schools has remained constant at 125, the recent opening of two new osteopathic schools has increased their number to 17. Two additional osteopathic schools are in the planning stage.(31)

The IOM also recommended that the federal government reform its policies for GME funding to bring support for the for the total number of first year GME slots much closer to the current number of graduates of U.S. medical schools. Currently, the number of first year GME positions is 145% of the number of U.S. graduates, and all filled positions are eligible for Medicare GME funding. To ensure that U.S. medical school graduates would have a GME slot available to them, the IOM recommended that they be given first choice for Medicare-supported positions. It suggested that a voucher system be considered as a means of accomplishing the latter.

Other IOM recommendations included federal and/or state action to provide replacement funding for IMG-dependent hospitals that provide substantial amounts of care to the poor, improved dissemination to potential medical school applicants of information on career opportunities in medicine , and more research into the relationship between the physician supply and health care cost, quality, and access.

The Pew Health Professions Commission made a number of recommendations similar to those in the IOM report.(5) It urged that the number of first year GME positions be reduced to a number equal to that of U.S. medical school graduates plus 10%. It suggested changes in immigration laws to ensure that IMGs return to their native countries upon completion of their training in the U.S., and recommended enlargement of the National Health Service Corps to attract post-residency physicians into service roles currently being filled by residents. The Commission went beyond the IOM report, however, in suggesting that it would be necessary to reduce the number of U.S. medical school graduates by 20-25% in order to deal with the physician oversupply.

Other physician workforce issues have been addressed both by the Pew Commission and the IOM Committee on the Future of Primary Care. The Pew Commission urged that 50% of residency training programs be in the primary care areas of family medicine, general internal medicine, and general pediatrics and that a minimum of 25% of clinical experience for both medical students and residents be in community, ambulatory, and managed care-based settings. It also recommended curriculum changes in all health science education programs to increase emphasis on the psycho-social-behavioral sciences, the population and health management sciences, information management, health promotion and disease prevention, culturally sensitive care, and the effective use of political reforms to change the burden of disease. To demonstrate the

interdependence of the health professions and to familiarize students with the delivery of care by interdisciplinary teams, the Pew Commission urged more sharing of clinical training resources, more cross-teaching by professional faculties, and a renewed emphasis on team training.

The IOM Committee on the Future of Primary Care(13) encouraged the team delivery of primary care and recommended that the training of primary care clinicians include experience with interdisciplinary teams. It supported the concept of interdisciplinary teaching of collaborative primary care and urged the development of common core competencies which all primary care clinicians should master. It recommended that all primary care education and training programs emphasize communication skills and cultural sensitivity. To promote primary care training in nonhospital sites such as HMOs, community clinics, physician offices, and extended care facilities, it recommended that a portion of federal GME funds be specifically designated for this purpose.

Prospects for Change

Steps are already being taken by academic medical centers and professional organizations to address some of the issues facing the physician workforce. Many medical schools are revising their curriculums to incorporate items of importance to managed care. The Federated Council for Internal Medicine has developed a new residency curriculum which focuses on outpatient training and the primary care skills often overlooked in traditional programs.(32) The National League for Nursing has established a Task Force on Interdisciplinary Professional Education which is working to promote a coordinated approach to this important issue.(33) Increasing numbers of medical students are selecting residencies in the primary care disciplines(34), due in part to their awareness of the realities of the marketplace but perhaps due also to the advice they receive from medical school faculty counselors. The Association of American Medical Colleges' "3000 by 2000" program is an example of an effort to correct maldistribution by race in the physician workforce. While much more needs to be done to improve medical school and residency curricula, expose students and residents to managed care and to interdisciplinary teams, and correct maldistribution of the physician workforce both by specialty and by race, there is still cause for optimism that these problems eventually will be resolved.

Despite more than 15 years of evidence that there is an oversupply of physicians, little has been done so far to address this problem. New medical schools are still being opened and, in what Dunn and Miller have termed "the shifting sands of graduate medical education", the reduced number of residents in some GME programs has been offset by an increasing number in other programs.(35) Proposals to limit the number of residency positions funded by Medicare and to restrict the entry of IMGs into GME and medical practice in the U.S. have been thwarted in Congress by hospitals that are heavily dependent on GME income and IMGs. Accrediting bodies, specialty societies, and specialty boards have been reluctant to take steps to limit entry into the profession because of antitrust concerns.

Nevertheless, there is some reason for optimism that the problem of physician oversupply will be addressed in the near future. The House Ways and Means committee has requested that the IOM develop a series of options it can consider in revising Medicare GME policies.(36) The leadership of the AAMC, IOM, American Medical Association, and Association of Academic Health Centers is meeting to discuss the development of a common position on the U.S. physician supply which the involved organizations can present to Congress.(36) Perhaps, after all these years, there is some light at the end of this decade and a half long tunnel.

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