

Educating physicians for population-based clinical practice.

by Merwyn R. Greenlick

Medical students should be trained to treat populations of patients rather than individual patients to better prepare themselves to practice medicine in the 21st century. Modern American medical education and practice has been based on the fee-for-service, one-to-one physician-patient relationship. The obligations of the modern physician should be expanded to include a set of physician-population obligations such as those that occur in the prepaid group practice setting. Medical students should be trained to achieve the highest quality of medical care for the lowest cost. They should receive training in the 'population sciences' to learn the epidemiologic basis of disease prevention and treatment. They should be trained to interact with high-risk members of the population who are reluctant to come into the office for treatment. Community-oriented medical insurance and practice has already changed the atmosphere in which most physicians practice.

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DEBATES about changing the current paradigm of medical education and medical practice have become fairly common in recent years (see, for example, the discussion in Kerr L. White's *The Task of Medicine: Dialogue at Wickenburg*[1]). Most of these dialogues have centered around the limitations of the biomedical model of disease for framing physician behavior and have recommended a broader framework, variously called a biopsychosocial,[2] behavioral,[3] or experimental approach.[4] In a similar spirit, the Association of American Medical Colleges, Washington, DC, has called for a total restructuring of the medical curriculum to better prepare physicians to function in the 21st century.[5]

From my current vantage point as chair of a medical school department of public health and preventive medicine, I would like to offer a somewhat different slant on expanding the paradigm of American medical education. My particular perspective has been shaped by a quarter century of managing research programs and observing medical practice within the world's largest nonprofit, prepaid group practice, Kaiser Permanente.

To go beyond the current debate on the biomedical vs the social approach, I want to focus instead on expanding the current set of physician obligations deriving from the one-to-one physician-patient relationship. The 21st-century physician will continue to face those obligations, but will also be required to deal with new obligations that flow from a more complex set of relationships with the population from which the patient comes.

THE NEED FOR AN EXPANDED

MODEL OF MEDICAL EDUCATION

The predominant model of American medical education and practice is rooted in the Hippocratic tradition and has grown out of the fee-for-service system - that is, out of a

particular set of historical circumstances that emphasized the one-to-one physician-patient relationship. Ironically, it was Abraham Flexner - who is often saddled with responsibility for promulgating the reductionist model of American medical education - who was among the first in this century to comment on an "enlargement of the physician's horizon":

His [the physician's] relation was formerly to his patient - at most to his patient's family; and it was almost altogether remedial. The patient had something the matter with him; the doctor was called in to cure it. Payment of a fee ended the transaction. But the physician's function is fast becoming social and preventive, rather than individual and curative.[6]

That was in 1910. Writing in 1988, Sherwin B. Nuland, who teaches surgery and the history of medicine at Yale University, New Haven, Conn, observed that "it is time to turn our thoughts to a new model" for physicians:

To the Hippocratic physician, nothing and no one was more important than his patient; this has always been a guiding principle of clinical medicine. Other patients, future patients, and the rest of mankind have been secondary considerations when a doctor is making decisions at the bedside of the sick. That day too is past.[7]

The near-80-year gap between these observations underscores that Flexner's advocacy of the physician's "social and preventive" functions has failed to take hold in the training of American physicians. In Western Europe, by contrast, the training of physicians has long been influenced by trends originally set in motion by pioneer thinkers like Rudolf Virchow. As early as 1848, Virchow was expounding on the relationship between disease and the environmental circumstances in which it occurred. This emphasis on the social obligations of the medical care system gradually flowered into numerous programs aimed at providing care equitably across various populations.

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In the United States, however, the nexus of the medical care system has remained the relationship between the individual provider and the individual patient despite the dramatic changes that have occurred in the context of physician practice. Following World War II, alternate ways of providing and paying for medical care evolved - most notably health insurance and largescale medical care systems - and the legal and ethical issues attending the great advances in medical technology became increasingly complex.[8] Within clinical settings, these and other developments necessarily changed the physician culture, but an educational framework for preparing physicians to practice within this new culture has yet to emerge. The cultural components of a prepaid group practice setting will not, and probably should not, be replicated in the fee-for-service sector. Nor am I suggesting that prepaid group practice organizations, Kaiser Permanente included, have realized their full potential as population-based providers. Nevertheless, several of the premises implicit in the prepaid group practice culture may well provide insights into an appropriate conceptual model for preparing physicians for the 21st century.

COMPONENTS OF AN EXPANDED

MODEL

Like all physicians, prepaid group practice physicians start with the cultural model into which they are socialized during their medical education. Ultimately, however, they are also influenced by the institutionalized, large-scale medical care systems in which they work. This influence, within a strong prepaid group practice culture such as the one I have been studying since 1964, maintains the central components of the traditional physician culture, but at the same time creates elements of a new culture.

At the heart of the new culture is an essential change in the way physicians think of their role and their obligations. Added on to the traditional obligations toward individual patients is a whole new set of obligations toward a relevant overall population. When this transformation works adequately, these new obligations include at least three components: (1) an economic or resource allocation component, (2) a component focusing on the epidemiologic nature of the new clinical practice, and (3) a component focusing on members of the population who do not regularly find their way into the physician's office, or who have needs that are not attended to within the normal context of physician care.

Resource Allocation

The obligation to refrain from financial exploitation of the

patient is a traditional requirement of the physician role, as are the more commonly noted obligations to refrain from physical, sexual, emotional, or other forms of exploitation. The economic obligation evolved out of a system where patients, when going to see the physician, brought with them the money-or, in some cases, barter, in the form of a sack of potatoes, an apple pie, or whatever-to pay for services. In that kind of transaction, the integrity of the physician was key, and it worked pretty well. Where the physician knew the patient and the patient's circumstances, the sliding fee scale emerged and, generally speaking, protected the patients from financial exploitation.

Then, with the emergence of health insurance, the patient who had come to a physician with a dollar or a sack of potatoes wasn't paying directly for the service. Somebody else was paying. The physician's prohibition against exploiting that patient began to lose its relevance, because some anonymous insurance company, not the patient, was facing the economic consequences of the physician's behavior. And in most cases the patient wasn't even paying the premium. The patient's employer had included comprehensive health insurance as a fringe benefit. Predictably, exploiting General Motors or Blue Cross did not carry the same normative weight as exploiting a flesh-and-blood patient.

I have observed that, in a prepaid group practice setting, the relationship that inextricably develops between physicians and the population they serve generates different economic consequences. How this occurs may not be immediately clear. I am not speaking here of the various financial incentives for individual prepaid group practice physicians to provide fewer services, nor am I suggesting here or elsewhere that physicians in any clinical setting should compromise their obligation to the individual patient out of regard for the interest of society. The "one-to-n" obligations I am referring to are generally played out by physicians working in medical staff committees, as consultants to organizations, or as managers. That is, physicians acting in their expanded physician role modify the context in which physicians acting in their traditional physician role operate.

Organizational decisions, such as cost-quality tradeoffs in deciding on capital investment, set practice limits in ways practicing physicians might not even notice. Similarly, decisions on treatment algorithms set practice limits. Thus, while prepaid group practice physicians do not deal with resource allocation issues when they are treating a patient in the examining room, they appropriately make such decisions while acting within their expanded physician role. Ideally, physicians throughout the system develop a unique relationship with the population they serve, a

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population that contributes the resources used to provide medical care. That is, the physician role gradually expands to include obligations requiring that the physicians not exploit that population any more than they would exploit an individual.

In the world of increasingly scarce medical care resources and the growing dependency on extraordinarily expensive diagnostic and therapeutic technology, this expanded set of obligations will affect all physicians. In fact, as we watch the demands for outcome research and therapeutic standards grow, we will become more and more aware that the one-to-n obligations prohibiting the economic exploitation of our populations have already become a part of the role of modern physicians.

These demands will increase, and we in medical education need to respond to them. For example, physicians practicing in this world will need much better training in the "population sciences" such as epidemiology, biostatistics, and management than current graduates are receiving. And their socialization will need to prepare them for working within organizations, with practice in dealing with the social realities of the more complex work environment.

The Epidemiologic Basis of

Clinical Practice

Besides influencing physician attitudes toward resource allocation, prepaid group practice settings create a somewhat different knowledge base about disease prevention and treatment than that which exists in the fee-for-service world, and this experience can provide guidance for improving medical practice in any setting. Under the current model of medical education, physicians are taught, generally in a tertiary care setting, a textbook set of probabilities for diagnosing and treating patients; ie, given a set of circumstances, diagnosis A has one probability set and diagnosis B has a different set. This is taught as if the world were made up of a single population, and as if the probabilities did not depend on the specific epidemiologic characteristics of the population from which the individual patient comes. In fact, however, the probabilities that a physician faces with an individual patient in a given circumstance are specific to the characteristics of the population from which that patient comes. A physician who does not have data on these specific populations does not have all of the relevant knowledge necessary to treat the patient.

Under some circumstances this failure can be critical. Take, for example, a study of the course and prognosis of sarcoidosis done at Kaiser Permanente in Portland.[9] The medical literature on sarcoidosis indicated that progressive

and ultimately lethal pulmonary fibrosis develops slowly in a small proportion of patients, variously estimated at 5% to 10%. A high intensity of patient evaluation and treatment is recommended, predicated on the belief that a substantial proportion of patients with sarcoidosis will have an untoward outcome and that the outcome might be prevented by aggressive and early management with corticosteroids.

The Portland study[6] found no fatalities from sarcoidosis in two decades among the members of the Kaiser Foundation Health Plan in Portland. The authors concluded that because of the method of disease identification, the favorable outcome more closely approximates the course and prognosis of the disease as it occurs in the population in general than do series emanating from institutional settings. This interpretation leads the clinician to quite different treatment recommendations when treating patients from the general population.

When considering this example, one can see how other factors can also be included in the knowledge base. When properly taken into account, knowledge about the social class, the occupational class, and other characteristics specific to the population being served can greatly enhance the physician's ability to treat each individual patient by providing more patient-specific diagnostic and treatment probabilities. That these population-based factors are not currently given adequate attention results as much from premises implicit in the biomedical model of disease and the current priorities of physician education as from the pressures, however great, to devote the lion's share of resources to providing services. In other words, we need to educate future physicians to understand and appreciate how this expanded knowledge base can inform the treatment decisions they will be called on to make.

There was a time when the fee-for-service physician, in addition to knowing each patient's financial status, also knew the community, the social and domestic circumstances of individual patients and, more than likely, those of the patient's family for several generations back. With the urbanization of health care and the fragmentation of the family, however, patterns of medical practice no longer allow for this kind of informal knowledge about the population from which the patient seen in the office is drawn. Consequently, a formal population-based clinical practice perspective has been neither relevant nor practical to the average fee-for-service physician.

But two factors will make it possible for the 21st-century physician to practice in a different manner. First, the organization and financing of health care are changing. Since most of the patients of the 21st century will come

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from an identified population, either with government or private dollars attaching to their population status, it will be easy to identify the relevant population of each patient assuming, again, that physicians have been trained to see the practical value of making the effort.

Of almost equal importance is the growing power of information technology. Until recently, even the most sophisticated physician would have difficulty accessing the epidemiologic data needed to treat patients on the basis of the disease characteristics of a specific population. New personal computer and database technology will eventually make it possible for any physician to record and access appropriate clinical information to provide the epidemiologic basis for clinical judgments based on the most likely probabilities. One of the challenges for the medical educational system is to familiarize physicians of the future with intellectual tools in the area of medical informatics and to structure medical education so that student physicians use state-of-the-art computer systems from the minute they begin their medical education. While computers are a comfortable daily tool for grade-school students in the United States, many medical schools are very slow in adopting computer technology into medical education.

Currently Excluded Populations

and Needs

As physicians become socialized to think in terms of their relationship to populations as well as to individual patients, a third component will gradually emerge—namely, concern about untreated risk and unmet need within the population. The boundary between social-political issues on the one hand and medical practice issues on the other will become less clearly defined. For example, it will no longer be appropriate, or even possible, to dismiss smoking in 20% of the adult population as a nonpractice issue, or to accept the concept that many women do not present themselves for a Papanicolaou test or mammography. Similarly, physicians will be compelled to take an interest in the rehabilitation of elderly, poststroke patients and to become more concerned about community-based, long-term care needs among the populations they serve.

To address this component of the new physician culture, a viable model of medical education must equip 21st-century physicians to deal with members of the population who are reluctant to bring their problems to the office, and to deal with issues that, to this point, have not been central to the therapeutic orientation of the clinician. More cross-cultural and cross-professional educational experiences are required.

As medical education moves out of the tertiary care institution and into ambulatory care, medical students need to be exposed to diverse cultural settings and to faculty who can help the students learn to accept approaches other than those of the dominant American culture. A 1981 survey of chairpersons of departments of medicine, pediatrics, and family medicine found that only 131 (45%) of 287 chairpersons reported that their medical students were taught "medical sociology." One chairperson's response was especially revealing: "It is dangerous to let sociologists into medical schools. They cause divisiveness by emphasizing differences in care rather than commonalities."^[10]

APPLYING THE EXPANDED MODEL

Not all physicians in the 21st century will be practicing within complex organizations such as prepaid group practice settings, nor am I suggesting that medical education should be radically reformed merely to accommodate those who will be. My point is that the complexities of medical insurance and the proliferation of large-scale, managed-care systems have already changed the atmosphere in which almost all physicians function. Relatively few physicians currently receive the majority of their income from solo, fee-for-service practice. Most are involved in complex practice arrangements and receive a large share of their income from population-based financing mechanisms, such as individual practice association health maintenance organizations and preferred provider organizations.

Witness also the growing enthusiasm for the new community-oriented primary care (COPC) models, in which elements of primary health care and of community medicine are systematically brought together in a coordinated practice. The Institute of Medicine report on the COPC model defines it as "the provision of primary care services to a defined community, coupled with systematic efforts to identify and address the major health problems of that community."^[11] Clearly, the very nature of this model requires using a one-to-n orientation as a way of structuring the practice approach. (In commenting on barriers to the development of COPCs, David Rogers notes "the failure of medical education to keep pace" with reality. "The landscape is littered with failed programs," Rogers contends, because of the "fundamental problem of ~physician mind set."^[12])

Despite these expanded realities of physician practice, however, the emphasis of medical education remains on models that relate only to individual patients rather than to populations. Most medical care professionals get little or no training in epidemiology, biostatistics, ethics, management, information sciences, economics, or in the social and

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behavioral sciences. In order to expand the effectiveness of the modern physician, we need to define an epidemiologic model of education that preserves the Hippocratic tradition and prepares physicians for the complex realities of 21st-century medical practice - realities that prepaid group practices have been grappling with for several decades. Regardless of the setting in which future physicians choose to practice, the expanded version of the medical culture in this new paradigm will result in greater integrity between how physicians think of themselves and what they do.

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