Teaching the fundamentals of primary care: a point of view.

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In the United States today major forces in society and within medicine are coming together to support an increase in the number of primary care physicians and an enlargement of the place of primary care in medical practice. The drive toward universal health insurance coverage and efforts at cost containment are playing an important part in fueling the movement toward primary care (Nutter et al. 1991; Budetti 1993). A shortage of physicians in rural and other underserved areas is also an impetus to the production of more primary care physicians (Young 1990; Riley et al. 1991; Roberts, Davis, and Wells 1991; Jecker and Berg 1992; McElmurray et al. 1992; Roberts et al. 1993). Medical schools and medical educators are rethinking the traditional curriculum and training of physicians (Kar 1990; Finberg et al. 1991; Stimmel 1992; Bryant and Morgan 1993).

Observing at the present moment, one might conclude that contemporary economic and political forces had selected primary care over specialty medicine as the solution to some of the problems of access and economics that now afflict American medicine. A historical perspective not only clarifies what primary care is and provides further understanding of its rise to prominence, but it also points up dangers that primary care training programs must overcome. Educational programs for primary care physicians have three goals: First, they must prepare physicians for the care of patients in the twenty-first century. To accomplish this they must develop the new knowledge base for this training. Finally, they must develop teaching methods that will overcome the obstacles against which previous attempts have foundered.

In Great Britain, in 1920, not long after national health insurance was instituted, primary care (the primary health center) was distinguished from the secondary consultative center and the teaching hospitals. The idea that primary care is the most general, entry-level medical care and that it is to be contrasted with referral centers that contain specialist care and with teaching hospitals has become widespread in the world. Primary care has been a central mode of medical care in many nations for a long time, providing an international body of varied experience (Bufford 1992; Blumenthal 1992; Whitcomb and Desgroseilliers 1992). The concept was further developed by the World Health Organization's search for health care systems that could advance the social goal of member governments for "the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life." The World Health Assembly, in subsequent deliberations, defined primary health care as follows:

Essential health care based on practical, scientifically sound, and

socially acceptable methods and technologies made universally

accessible to individuals and families in the community by means

acceptable to them and at a cost that the community and the country

can afford to maintain at every stage of their development in a spirit of

self-reliance and self-determination. It forms an integral part of both the

country's health system of which it is the central function and the main

focus of the overall social and economic development of the

community. It is the first level of contact of individuals, the family and

the community with the national health system, bringing health care as

close as possible to where people live and work and constitutes the first

element of a continuing health care process. (World Health Organization

1978)

At first glance it seems to be describing a kind of medicine that is ideal for dealing with the most common problems in the poorly defined fashion that they often show themselves. As Barbara Starfield points out, "It addresses the most common problems in the community by providing preventive, curative, and rehabilitative services to maximize health and well-being. It integrates care when more than one health problem exists, and deals with the context in which illness exists and influences people's responses to their health problems" (Starfield 1992, 4). Similar concepts mark a statement on the generalist physician by the American Boards of Family Practice and Internal Medicine (Kimball and Young 1994). When the implications of these definitions are elaborated, primary care takes on a complexity that is a far cry from the purpose delineated for it by the British National Health Service.

Two other movements in medicine and widespread social changes of the last generation further define what is asked of primary care. The family practice movement gained force in the 1960s. Decrying specialty medicine's concentration on the disease rather than the patient, it sought to focus the doctor on the patient in a special way. In G. Gayle Stephen's words:

Family physicians know their patients, know their patients' families,

know their practices, and know themselves. Their role in the health care

process permits them to know these things in a special way denied to all

those who do not fulfill this role. The true foundation of family medicine

lies in the formalization and transmission of this knowledge. (Stephens

1982, 8)

Increasingly apparent in the 1970s, the hospice movement became another force toward care of a patient as a sick person within a family and community matrix. It is the sine qua non of palliative care that disease-oriented medicine has failed to cure the patient or meet the needs of patient and family. Palliative care is often associated with symptom control, but hospice physicians know that symptom control cannot be adequate in the absence of a much broader understanding of dying patients -- suffering is an affliction of persons, not bodies, and can occur in relation to any aspect of a person: physical, psychological, social, or spiritual (Cassell 1982).

The family practice and palliative care movements were born during a period in the United States marked by a great expansion of our understanding of the concept of person. The civil rights and women's movement, the embrace of difference and diversity leading to the disappearance of the melting-pot metaphor, and the rise of bioethics, all celebrated the emergence of an enriched concept of person. For medicine, this translated into care not merely of an individual or a bearer of rights, but of "me, [as in] Doctor -- treat me, not just my lungs or liver!"

The family practice movement grew rapidly in the early years after its official designation as a specialty in 1970, but then faltered. Palliative care continues to struggle to gain acceptance within mainstream medicine. And, as

we all know, the idealism that pervaded medicine after World War II and into the mid-1970s has been overwhelmed by the dominance of economic forces and conservativism throughout the society.

It is of little surprise, then, that in a time when economics speaks so loudly, primary care has come by many to be seen basically as a kind of medicine with economic, social, and administrative advantages, although little regard has been accorded it as medicine qua medicine. It is inexpensive compared to high-technology specialist care, it can be provided in a physically accessible way and fit into the social structure of the patient population it serves, and it is administratively uncomplicated because it can be delivered in community settings. Some other common defining characteristics that have been discussed are that primary care physicians are first-contact doctors: they may act as gatekeepers-aiding in the more rational use of resources; they are not specialists or are not functioning as specialists. It is a common and destructive error to believe that these obvious organizational advantages mean that the medicine itself is simple.

The shift to primary care is viewed by some medical professionals (including myself) as a sea change from which a richer and finer medicine will emerge and by others as degradation of current scientific and technological subspecialty medicine. In light of the attention given to the subject, and its importance, what has been written about the changes is disappointing because it is incomplete. The literature clearly reveals that primary care physicians, generalists, will no longer focus on a patient's physical disorders but will be aware of psychosocial factors in health and disease and of the patient's place in the community as well as their own. They will be responsive not only to the varied needs of individual patients, but also to the other demands of the health care scene, from the economic to the environmental. They will understand the importance of preventive medicine and of helping their patients and communities to lead healthy lives. What remains unclear is how this new generation of primary care physicians will accomplish these tasks, what new kinds of knowledge they will require, who will teach them, and how actual day-to-day doctoring will look. One might object that the family practice literature now, and for years, has, for example, emphasized the doctor-patient relationship, concentrating on the whole patient, teaching communication skills, seeing the patient within the context of family and community, and changing to a biopsychosocial model of illness (McWhinney 1989; Rudebeck 1991). No one questions the soundness of these ideas; the problem is that, after a full generation of prominence, they simply have not thrived within a disease-oriented, technology-driven medicine, in much the same way as, for two generations, we have asked doctors to focus on the patient as a person, yet, more often than not, the patient's human concerns are still swept away by the technological imperative.

The failed medical care programs of the 1960s are strong reminders of the danger of imposing expectations on both physicians and the public that medical generalists will be ill trained to meet. Virtually all the descriptive ideas and terms currently used to envision the advantages of primary care -- for example, "continuing," "coordinating," and "comprehensive" -- characterized the medical programs funded as part of President Lyndon Johnson's war on poverty. Naturally enough, as the money dried up, the programs and the medical care institutions that were part of them disappeared. The ideas, unfortunately, also got tucked away, suffering from malnourishment. They did not catch on or become institutionalized; rather, they were blown away by the flowering of speciality medicine and the burgeoning of technology. During the same period, many medical schools had introduced social and behavioral science programs that also generally failed to translate their teaching into medical skills, and so they too disappeared.

I suggest that we start with a supposal. Suppose it is the case that the fundamental idea of primary care -- make the sick or well person the subject and object of medical care -- has been heard widely enough. Here, the word "person" is used in its widest sense-the referent of the statement, "I am a person." No persons exist apart from their past experiences or beliefs, their families, their family history and beliefs, their relationships with others and with their bodies, their culture and society and their roles therein, and their daily behaviors. Every person is a political being. Everyone has a secret life and a believed-in future. And, finally, every person has a spiritual dimension. Assume also that doctors are aware that these aspects of persons have an impact on the onset, presentation, diagnosis, treatment, course, and outcome of illness. Suppose, then, that the problem is not a failure of the dissemination of the idea of the central importance of the person in primary care, but, rather, is the

reality that physicians, generally and for the most part, still do not have the cognitive tools to bring the person into the center of medical practice. On the basis of the supposal, examining the reasons for the physician's difficulty is essential. That accomplished, it is possible to search for new solutions with hope for their success.

An invisible barrier exists, I believe, thwarting the best intentions of physicians and their teachers to put into practice the foundational ideas of primary care. This barrier is the conflict between the kind of knowledge which physicians know disease -- the science of medicine -- and the kind of knowledge by which they know and act on their patients as the particular individuals they are. The conflict is manifest within the world of medicine, where the scientific ideal of knowledge-as objective and measurable -- disparages the largely subjective, nonmeasurable knowledge of patients. This barrier to many of the patient goals of primary care is also within physicians themselves because different, even contradictory, kinds of thought are required of them when they think about the science of medicine than when they consider the individual patient.

The conflict between knowledge of the patient and knowledge of the disease has existed from the beginnings of medicine. From the time of Hippocrates, the history of medicine has been marked by a struggle between two major ideas: rationalism and empiricism (Courter 1973). Rationalism focuses on theories of diseases, their origins in nature and biological mechanisms, and on science. It bases the actions of physicians on these theories. Empiricism is concerned with patients: what it is about them and their interaction with their environment and with nature (in the form of the mechanisms of disease) that produces this illness at this time. Empiricism focuses the actions of physicians on patients themselves rather than primarily on their diseases. Not surprisingly, we live in a predominately rationalist era. The conflict is now complicated and worsened by rampant technology.

The same conflict has been seen as the difference between reductionist and nonreductionist views of nature, or between reductionist and holistic science. It is the underlying theme in the struggle between the science of medicine and the art of medicine. How the conflict is pictured matters because the understanding must be translated into teaching programs that directly address the difficulty students are having in thinking about their patients in contradictory fashions and that permit them to be comfortable with two different kinds of knowledge.

Science is, by nature, rationalist. Scientists progressively abstract from the objective world of perceptual, sensual reality until their concepts successfully capture the universal nature of the process under study. Whereas the real world of patients may be the ultimate touchstone that tests the correctness of the concept, good science is necessarily ever further from the everyday world. The best molecular biology exemplifies good science. Finding a gene for a disease suggests that, if the gene is present, the patient should have the disease. Sometimes yes and sometimes no. The degree to which the disease will be expressed, if at all, in the presence of the genetic determinant depends on a host of factors within the patient and the environment. This indeterminacy does not invalidate genetic theory. The theory is not about patients in general or a particular patient. It is about genes and how they are translated into the proteins that make things happen in nature. Applying the knowledge of disease that follows from the theory is the clinician's job.

Knowledge of a particular patient is necessarily the exact opposite of scientific knowledge. The more immediately the perceptual and institutional information flows from the patient, the truer is the knowledge of that patient. Any abstraction produces an inaccurate picture. Premature judgments, preconceptions, biases, and stereotypes are misleading abstractions. Complete knowledge of the person is impossible -- the person, as it is said, is ineffable. The only instrument that can come close to knowing a person is another person: in our instance, a physician. The physician comes to know the patient through listening to what is said and unsaid, seeing what is manifest and not manifest in the patient's ongoing presentation to the world, feeling with the examining hands what the body has to tell, and finally, being aware of feeling and emotion. This ongoing process (it is not a static event) produces information that, like all information, is true -- it approximates reality -- within levels of probability. Consequently, it is the physician's job to constantly assess how good the information is.

Most of the information acquired is subjective; it cannot be otherwise. It is only through understanding the subjective nature of it that one can best gather the information, value it, and use it. The subjective is made objective by being actively thought about -- it becomes an object of thought. To be shared or described it must be

converted into language. This step has pitfalls because it is in the nature of language to create abstractions. Appealing as it so often is, however, to stay within the subjective arena, where, for example, it is enough to present "my feeling about this patient. . . .," that will not do, at least with physicians in training. The subjective must be rendered objective in order to weigh it with and against the objective, "hard" data generated by tests, images, and other clinical measurements. For the physician to be the instrument of knowledge of the patient requires training in systematic and disciplined sujectivity. You will appreciate the difficulty of the educational task of teaching this kind of subjectivity when you reflect that most physicians have been taught since grammar school that the ideal kind of knowledge is scientific and objective. Further, all around them in medicine, that which is objective -- in the sense of measurable -- is valued and those things that are subjective are disvalued. The problem is simplified by realizing that we don't want doctors to write Tolstoy's The Death of Ivan Illych. We want them to treat this patient at this time in this context according to the best interests of the patient as the patient and the doctor know those interests, within the constraints of fate and circumstances, while employing the most appropriate medical science and technology.

This is what we have asked the art of medicine to do in generations past. Even with the best intentions, the largely untutored learning of the ill-defined aspects of the art of medicine is no longer a match for how medical science and technology are learned and taken to heart. Education in regard to medical science and technology has far outpaced that of the art. The training of primary care physicians must recognize a distinction between doctoring itself and the medical science on which it is based. If primary care physicians are to fulfill their anticipated role, teaching the techniques and knowledge base of doctoring -- how to take care of patients -- should be as explicit as the teaching of medical science. A true and sustained shift toward the training of primary care physicians, therefore, will rely on distinct changes in graduate and postgraduate education.

In what follows, I am addressing the problem of training subjectivity to an extent that it can meet objectivity on level ground. Some may be disturbed by my apparently single-minded concentration on the individual doctor and patient and on their relationship. I believe one cannot know any particular patient except through the relationship with that patient: not any relationship, but the doctor-patient relationship (Cassell 1991, ch. 5). This does not deny the importance of culture, society, or family to the individual patient and illness, constituting, as they may, the social fabric of the patient, but their influence arises because the person instantiates them through the concepts, language, knowledge, and beliefs that direct behavior. Doctors acknowledge the impact of the social makeup of the patient on health or illness by facilitating the flow of information they receive from the patient based on respect for persons and unfiltered through preconceptions or prejudice.

When physicians are in the presence of the patient, connected through the relationship so that they can know the patient in the way I have described, they bring to the experience their knowledge of the social and personal dimensions of the human condition, which helps direct and interpret the interaction. In order to understand the individual, doctors must know about the wider cultural and social milieu in which their patients live. If a doctor does not know that corporations are currently downsizing, she will have difficulty understanding the concerns of an apparently successful middle manager. Similarly, not to know about the Hasidic family structure is to misunderstand the dynamics of the Hasidic couple in front of him. Caution is required so that physicians do not use this knowledge to create abstractions that would interfere with their direct knowledge of the patient. Acting only on knowledge of families in general can be as error producing as acting only on knowledge of pneumonias in general. How knowledge of all the aspects of personhood is employed will vary, of course, with the clinical problem: for example, the care of the dying or the encouragement of a healthier family lifestyle.

The newer focus of primary care physicians will be the enhancement, preservation, or restoration of physical, psychological, and social functioning within the context of community. The relief of suffering stands alongside the preservation of life. Adopting this focus cannot be accomplished merely by reorienting the training of doctors or making them aware of patients' needs. The patient, as a sick or well person, is in many ways a new object of interest. Because of this, doctors require methods of understanding, observation, thought, and judgment that allow them, in the naturalist fashion, to really see patients as "person-things," apart from the mechanisms of disease. (We are not speaking of disease, and also the patient, in the fashion of the dominant understanding of

this century, but of the patient first and the disease and pathophysiology through the patient.)

Curricular change in American medical education is a slow process, subject to powerful internal and external political and economic forces (Sheets, Anderson, and Alguire 1992). For this reason, I am discussing postgraduate training, rather than the teaching of medical students. I do not mean to rule out this content in medical school. Generalist programs, on the other hand, control tiheir own teaching, but they usually do not have sufficient power to change their school's curriculum. Primary care is not a unitary field. Family practitioners, general internists, and general pediatricians have different perspectives. I have been a practicing general internist for more than three decades, and this has shaped my belief that the primary interest of general internists is sick adults. Family practitioners have a wider range of clinical skills, but I expect that they are less concerned with the very seriously ill. General pediatricians are, by definition, interested in children and adolescents. Despite their differences, these disciplines share a fundamental concern with persons, sick or well. This essay is about what is common to these different approaches to primary care. It might be argued that specialists should also care more about their patients than their diseases. Perhaps so, but appropriate changes in their training are not under the control of generalists, and will more likely come about after than before primary care has demonstrated success in training and clinical performance.

Much of the suggested change in education has revolved around the place of training. It seems clear that the traditional method of training physicians primarily on the wards of teaching hospitals is inadequate. It is considered essential by many that primary care training should take place in an ambulatory setting like an outpatient clinic, physician's office, or the community (Perkoff 1986; Lane 1988; Wooliscroft and Shwenk 1989; Branch 1990; Smilkstein 1990; Philbrick et al. 1990; Verby et al. 1991; Yonke and Foley 1991; Skochelak end Jackson 1992; Rees and Wass 1993; Richards and Henry 1993). Unquestionably, the problems presented by patients outside of the hospital are different than for inpatients, and different skills are necessary for their care. Furthermore, many patients who previously required a hospital for their care or surgery are now commonly treated outside the hospital. There can be no change in the direction of medicine without a concurrent change in the training of doctors so that their education matches them to their actual tasks in the care of patients, but this goes far beyond merely shifting their place of training (Murray, Wartman, and Swanson 1992). Changing the place of training also changes the kind of problems physicians face. In an outpatient setting they will gain experience in the everyday issues that face primary care doctors. A number of authors in the primary care literature point out that epidemiology teaches us that patients frequently come to doctors with symptoms, not disease. This is a reason to change the emphasis from recognizing the disease to understanding and ferreting out the biopsychosocial process that led to the symptom. All symptoms have a cause, a pathophysiology, and a meaning. It is not a reason to avoid training in serious diseases, even if they are rare. It would, for example, be an egregious, and probably fatal, error for a doctor to miss treating early meningococcemia because it is uncommon. On the other hand, musculoskeletal disorders are very common and, except for the osteopathic schools, their recognition and treatment are generally inadequately taught to undergraduates or residents. The underlying problem correctly addressed by the stress on epidemiology is the still too common belief that diseases are more real than the patients who have them (Cassell 1991, ch. 7).

The goals of postgraduate training of generalists cannot be adequately met by clinical training alone, no matter what the setting. Systematic instruction in classrooms or seminars is necessary to solve the problem of the conflict and lack of balance between trained objectivity and trained subjectivity discussed above. I am well aware that this idea is both outre and repugnant to most medical educators, but I believe we must reexamine this question carefully. The present method of training was developed in Sir William Osler's era, when Osler's objective (see his textbook) was to teach about the actual presentation of disease, its variability among patients, and the impact of this reality on diagnosis. The newly developed clinical laboratories were just off the wards of the Johns Hopkins Hospitals, and they demonstrated the direct applicability of science to clinical medicine. Most doctors ultimately did either medicine or surgery (or both), and their teachers did the thing they taught -- they were practicing physicians. The lesson of Johns Hopkins was then introduced into practice. Osler's basic message is now taken for granted, but it is forgotten that his teaching method was in the service of an idea. The new focus of primary care is a new idea for medicine, and the necessary skills of doctoring are now much more

advanced than they were, so that new methods of teaching must be developed to meet the idea. Thus, as the subspecialist goes off to the laboratory to learn science, so the generalist must return to the classroom to learn the basic skills of doctoring. Ophthalmologists have been taught in classrooms for years because they must learn the basic sciences of the eye that are not taught in medical school. Orthopedists are increasingly being taught the use of new technologies in this fashion. Physicians going into public health return to the classroom, as do modern physician-administrators.

There is a further problem to be solved. We like to believe that doctors gather evidence and reason from the facts and their knowledge of medical science to arrive at a decision that is best for a particular patient. To the contrary. The modes of thought in which physicians are trained and that govern much of their behavior are based on virtually automatic skills and rules that are preprogrammed and learned early in their training (Leape 1994). These skills and rules concern disease and technology, not persons. Doctors have not been trained to acquire similar rules and skills about persons. Until they are, their best intentions for a sick person may be overridden by an ingrained automatic rule.

Postgraduate instruction must teach doctors to be their own instrument, retaining such confidence in the discipline of their subjectivity that they allow it to compete with possibly conflicting images on films or the numbers on a printout or the siren call of a sweet technology. New rules and skills must be acquired that are related to persons. Hands-on postgraduate training is no longer adequate to these tasks. I have been practicing medicine for decades, and I have been writing about and studying this problem for 20 years. I still have difficulty integrating objective data, moral imperatives, aesthetic information, the value-laden, and the affective. I do not think the difficulty is unique to me. It is not merely principles or attitudes that must be taught, but difficult skills.

Knowledge Bases

The fundamental knowledge base for primary care remains the traditional preclinical science of medicine. It is the foundation from which modern Western medicine derives its legitimacy. It is the basic source of knowledge about nature as it is expressed in the body in health and disease. All surgical and medical interventions in the pathophysiology and pathoanatomy of disease are founded on it. It is about what Carl Rudebeck (1991) calls the body-as-nature. We must hope that when we get our recent graduates they know it well. Knowledge of social science would also be helpful, but too often this is not the case. It would make easier our task of teaching, again after Rudebeck, about the body-as-self.

Primary care doctors, as part of their mandatory training, must be taught the behavior of sick and well persons, advanced communication skills, the acquisition of information from disparate sources and its use in judgment and decision making, and about human function and disability. They must also master technology through explicit training and learn modern therapeutics as well. A thorough grounding in preventive medicine is necessary. These educational developments will provide opportunities for exciting curricular innovation.

Knowledge of Persons

If the person (sick or well) is the subject and object of medicine, then knowledge of persons takes its place alongside science as a fundamental knowledge base. Until very recently knowledge of persons was considered behavioral science, and attempts to introduce it into the medical curriculum generally failed. Entering medical students now commonly have had no training in psychology. Departments of psychiatry have not infrequently shifted emphasis away from psychodynamically based therapies and toward brain pathophysiology and psychopharmacology. As a consequence, it is not uncommon to find graduating medical students who have had no training in normal or abnormal psychology, no experience with nondrug treatment of emotional illness, and no instruction in the psychology of physical illness.

The social sciences are essential to teaching knowledge of persons. They have entered the teaching process in different ways in various programs. I believe social scientists make their best contribution when they bring their insights to bear during the discussion of particular patients -- "bedside" teaching -- rather than in the classroom.

In the same manner, clinical ethicists have discovered how much they have to contribute to the clinical discussion of cases (Zaner 1993).

Development of a core curriculum for knowledge of persons -- the subject matter and how best to teach it -- remains to be accomplished, although bits and pieces are to be found in medical colleges and centers all over the United States. Knowledge of persons includes an understanding of families and of the relationships of persons within them. Knowledge of persons also includes knowledge of communities and how persons and their families relate to the community. Writing about these subjects as I do here, I am aware, has a seemingly naive quality. I know that family practice has emphasized the centrality of the family in medical care, and its literature on this subject is large. Medical care delivered to individuals through the office of the community has also received considerable attention, more extensively outside the United States. By writing in this fashion, I mean to suggest that making the person the subject and object of medicine, and training the subjectivity of physicians in a systematic fashion, changes the relations among doctors, persons, families, and communities. Previous knowledge is not thereby invalidated, but requires rethinking, much as the increasing availability of very early diagnostic tests for cancer requires reorienting previous knowledge of cancer.

In the absence of general agreement about what "knowledge of persons" is, providing primary care doctors with effective communication skills, trained observational skills, and the ability to describe (narrate) in speech and writing what they know of patients gives them a basis for learning from their experience (Hunter 1991). The virtually unmediated appreciation of a patient is difficult and counterintuitive to the traditionally trained physician. Here, I believe the classroom is essential.

Knowledge of Function and Process

The change of goals I have described requires a shift in understanding of the nature of illness to one where the continuum of function figures more heavily than isolated disease states. Certain groups of patients exemplify specific problems, a concept that teaching imparts. The chronically ill, the elderly, and the disabled are such populations.

Chronic Illness

The training of primary care physicians must acknowledge that chronic disease is a far greater cause of death then acute disease, that most patients have chronic disease, that the problems of chronic disease are different from those of acute disease, and that the acute diseases are a false model for chronic disease. In short, primary care must reorient itself toward chronic disease. Chronic illness and chronic disease are distinct from one another. Patients may have chronic diseases like hypertension or diabetes without being ill. Chronic illness may be present where there are no recognized disease states -- for example, chronic pain syndrome, post-polio syndrome, obesity, or long-standing congenital malformations. Scientific understanding of disease is often inadequate to explain either suffering in chronic illness or the manifestations of the illnesses themselves. Symptoms, the patients' reactions to their illness, and even the actions of physicians all become part of illness as it unfolds over time. Further, for the most part doctors do not treat chronic illness; they teach patients to care for themselves.

The Elderly

The growing size of the population of elderly makes it impractical to have medical care delivered only by geriatricians. Yet treatment suffers when traditional disease models are employed to evaluate the problems that accompany advancing age. Older patients frequently have several distinct diseases and physical findings that would be a cause for alarm in younger patients -- cardiac murmurs, for example. If each disease is vigorously pursued either diagnostically or therapeutically, disaster may ensue. In like manner, if the various diseases are divided among subspecialists without the rare happening of careful coordination, problems with medication, for one, commonly arise. Diseases like osteoarthritis, commonly brushed aside with remarks like "What do you expect at your age?" are a major source of disability. These can often be successfully managed, keeping an old

person active and functional. Primary care physicians must be trained in the care of the aged.

Disability

The evaluation of impairment and the promotion of improved functional status and return to work exemplify an important category of knowledge and skills for training primary care physicians. Persons with disabilities have achieved special status in the society that elevates their medical problems from peripheral to central importance. In both the aged and the disabled, thinking in terms of function rather than disease states is crucial to successful doctoring. Also necessary in the care of both groups is a knowledge of musculoskeletal disease and dysfunction. Rehabilitation has been one of the major advances in American medicine since World War II, yet it remains peripheral in the educational process. To understand disability, physicians must look beyond the abilities of the individual to the functional demands of the workplace and the community. The world of work is an essential aspect of the lives of all people. Its importance in the life of a patient demands a knowledge not only of a patient's function, but also of what can be done to help patients perform the social roles of their age group, and what modifications in the society, the home, and the workplace might be required for their performance. Measuring functional ability is a learnable skill for which criteria are in various stages of development.

Technology and Diagnostics

The proper diagnostic and therapeutic utilization of technology should become a subject of systematic instruction for primary care physicians. Its content should be taught apart from, as well as within, the patient care setting. Why is this necessary when patients must ultimately be referred to specialists skilled in the use of the technologies? Technologies are not things apart from the purposes of those who direct their use or employ them. When the goals of care change, as described here, then deployment of the technology must change; this will occur under the direction of the referring primary care doctor. Next, the impact on a patient of a particular technology will depend in part on how the technology is explained initially to the patient, requested from the specialist, and its results then interpreted to the patient. This requires knowledge on the part of the referring doctor. Finally, the current problem of a rampant technology demands physicians specifically trained in its restraint (Cassell 1993).

The trainee is being taught "diagnostics" -- how diagnostic goals are set and how technology is employed to meet these intentions. Technology admits of general principles that can be taught by the specialists in each technological field. In addition, clinical epidemiology has developed rational methods for deciding when a specific diagnostic technique will add useful information or increase diagnostic accuracy (Fletcher, Fletcher, and Wagner 1988; Sackett et al. 1991). General internists must know how and when and (when not) to use each and all diagnostic technology, even when that technology falls within the purview of another specialty. Their knowledge should be sufficiently generalizable so that they can master new technology as it arises. Diagnostic imaging and endoscopy are examples of effective, widely used diagnostic technologies. It makes little sense to expect primary care physicians to learn the complexities of imaging through experience alone; the diagnostic and economic stakes are too high. Radiologists do not make up things as they go along; however, they work with basic concepts, scientific evidence, and empirically demonstrable facts, all of which can be taught. Primary care doctors should be able to read sonograms, chest X rays, echocardiograms, abdominal computer tomography, and back and joint images with considerable confidence. This is not because of lack of faith in their imaging colleagues, but because all of these images have brought anatomy and anatomical truth back into medicine, and primary care doctors should once again know anatomy if they are to understand their patients' problems. Many other technologies, like endoscopy, EKGs, pulmonary function tests, cardiac procedures (treadmill exercise tests, echocardiograms, thallium scans, and angiograms), even automated blood chemistry testing, and others yet to be developed must be understood by primary care physicians if they are to be masters, not slaves, to their technologies.

Therapeutics

At present, therapeutics -- the use of pharmacological, biological, or other agents in the treatment of sick persons

-- rests on the pharmacology taught in the second year of medical school. Modern therapeutics have advanced far beyond the stage that a second-year medical student can comprehend. Further, decisions about their deployment are too complex to be taught only by precept or in conferences during postgraduate training. These complex therapeutics and pharmacodynamics have been thought to be the province of the subspecialist, but if primary care physicians are to carry out the role envisioned for them, they must understand the theory behind their use and be prepared for the new agents to come. The effect of inadequate training is evident not only in the use of new drugs or treatments but even in classes of agents that have been around for years: for example, antibiotics and analgesics. Here is an area where we do not lack for teachers -- the clinical pharmacologists have been waiting for our call.

The Health Care Team

Primary care physicians require the assistance of many other health care professionals, but overdependence on other professionals can make for inadequate physicians. For example, reliance on social workers to handle the psychosocial aspects of illness can lead physicians to avoid learning first hand how to deal with patients. The combination of leadership skills and respect for others will require extensive training.

Preventive Medicine

Preventive medicine has become increasingly important in discussions of primary care (Lane 1992; Greenlick 1992; Albright et al. 1992). The field of public health has long used the concept in relation to preventing disease in individuals (e.g., immunization) and populations (sanitation and other environmental controls) or in preventing illness in persons already diseased (e.g., treating a tuberculin-positive person with antibiotics).

The modern sense of preventive medicine is broader and finds its intellectual basis in the understanding that virtually all illness is a process arising from progressive alterations in biological function that are influenced by the nature of the sick person and the context -- environmental and social forces that affect the person. It follows from this that the effect on individuals of the biological processes of disease can be altered -- illness can be reduced or prevented -- by changing the behavior of the person and/or by acting on that person's life context. Thus, for example, changing the American diet and promoting healthier lifestyles take their place alongside smoking cessation and daily aspirin intake in reducing the prevalence of coronary artery disease and the incidence of coronary events. As another example, changing the home or work environment can have salutary effects on diseases as disparate as asthma and depression. Prevention includes treating persons in whom important disease is present so that their function is returned or preserved to allow continued activities of daily living and, optimally, return to work or other activities.

These examples show that virtually all good medical care has an element of prevention. The effective action of physicians in preventive medicine requires a knowledge not only of conventional medical interventions, but also of life context and behavioral or social interventions that contravene the impact of habits or activities that could lead to disability or dysfunction. The patient's skin is no longer the boundary of medical knowledge. The modern sense of prevention is heavily oriented toward the active participation of patients, with the individual physician (if doctors are involved at all) as teacher. The modern sense of prevention involves a different and more active understanding of the relation of persons to their bodies, their well-being, and their future. It also requires a greater comprehension of normal function as opposed to abnormal function and structure. It requires a greater understanding of human development and extends the spectrum of potential for change into old age rather than, as is usual, seeing childhood as the paradigm. As a field of knowledge, the surface of preventive medicine has hardly been scratched. It is important, however, to avoid getting caught up in popular ideas that can lead to overenthusiastic embrace of questionable prevention strategies (Russell 1994).

The Physician as Therapeutic Instrument

When the primary subject and object of medicine is the patient, then the physician as person becomes the central diagnostic and therapeutic instrument. In this setting, the personal skills of the physician become a

fundamental aspect of clinical care: not an epiphenomenon (as they are when disease is the focus), but in partnership with science and technology.

Clinical Judgment

Medicine is a judgment profession, but judgment is often taught by precept alone, and then usually not explicitly. Clinical epidemiology and clinical decision making are new fields that have brought into clinical medicine the methodology of epidemiology and decision analysis as the basis for analyzing clinical events. These tools represent a major step in systematizing medical judgment, and they should be part of every clinician's training. As currently described, however, they include only a portion of the spectrum of clinical judgment because they deal almost exclusively with measurable information. Clinical medicine abounds with important areas of nonquantifiable information -- that is, subjective data, values, feelings, and even intuitions -- each of which must be given its weight and, like that which is measurable, considered in the terms of confidence limits, validity, accuracy, and precision. Primary care physicians should be able to use all kinds of information to examine their presuppositions, separate and examine the values at issue in each judgment, decide on goals and argue the alternatives, decide on priorities of judgment, determine if and how to intervene, and be able to evaluate the outcome. Clinical ethics, although obviously part of judgment, is a separate and very necessary aspect of training.

Information Handling

The ability to have easy access to the remarkable increase in information about medicine, medical science, and related subjects is an essential aspect of any physician's skills. Thus, training programs for generalists must ensure that trainees be able to accomplish this access and have an understanding of the new field, often called informatics, that is so dependent on the use of the computer (Blots 1984).

Communication Skills

Spoken language is the most important tool in medicine. Virtually no interaction between the patient and the doctor takes place in its absence. Despite the long acknowledged place of history taking and talking with patients, communication skills continue to languish. The current medical school curriculum universally includes history taking, but rarely other aspects of communication with patients. Because the telephone has assumed such a major place in medicine today, the special method of inquiry about illness and the altered diagnostic goals it requires must be taught (Wood, Littlefield, and Foulds 1989). The basic workings of the spoken language should be included in training programs if communication is to achieve maximum effectiveness. Remember the childhood chant, "Sticks and stones can break my bones but words can never hurt me"? If you want to know how wrong that is, listen to a physician untrained in communication skills tell a patient bad news (Buckman 1989). In the last several years a number of well-grounded studies on interviewing and doctor-patient communication have appeared (Cassell 1985a,b; Stewart and Roter 1989; Billings and Stoeckle 1989; Coulehan and Block 1992; Epstein et al. 1993). Because spoken interactions are ubiquitous, it is necessary to extend training well beyond merely inteniewing or history taking. Critiquing audio or videotapes of the interactions of trainees with patients is useful, but it is a halfway methodology. Unless there is systematic instruction in how language works, it would be like teaching physical diagnosis without a basis in anatomy or physiology.

The Doctor-Patient Relationship

Every step of medical care requires the cooperation of the patient. People, sick or well, do not do things just because they should, or because a doctor tells them to. They must trust that the physician is knowledgeable, is correct in this instance, and cares about them. The world of sickness is filled with far more uncertainties for patients than for physicians; as the threat of a disease increases, each decision seems more crucial and the room for error narrows. The patient's uncertainties increase, and firm resolution becomes less possible. Patients solve this awful dilemma by trusting their doctors. They say, in essence, "I may not know what to do, but my doctor does." The vehicle that makes it possible to trust someone whom they may have known for only minutes