
Teaching Medical Students About Disease Prevention and Health Promotion

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MOST DEPARTMENTS OF PREVENTIVE MEDICINE 20 years ago were teaching a variety of subjects, including biostatistics, epidemiology, public health, sanitation, and industrial and occupational health, as well as whatever content was left over from a variety of other departments.

In 1963, I was asked to head a new department at the University of Kansas, which I called Preventive Medicine and Community Health. I was permitted to take over and retain a number of functions that I considered important laboratories for teaching—the clinics, the Employee and Student Health Services, and the Hospital Infection Control Committee. From 1963 to 1969, the department's operation was based on several ground rules, including, "Thou shalt begin early to sensitize medical students to relevant concepts/content."

We offered a 10-week elective for first-year medical students in a Multidisciplinary Home Care Unit. On Friday afternoons first-year students, a multidisciplinary staff, and students from other disciplines—including nursing and occupational and physical therapy—made

home visits to chronically ill patients. After these visits, we returned to the unit for a seminar in which the content of the basic sciences was integrated with management and social issues concerned with the care of these patients.

Because of expressed concern by the basic science faculty that this experience of "playing doctor" would be detrimental, we conducted a randomized clinical trial of the elective. Volunteers (80 percent of the class) were randomly allocated to treatment (home care) or control groups. We post-tested the entire class with an exam designed to test the concepts of home care, knowledge of applied physiology and biochemistry, and orientations to patients. Home care students scored "better" on most of these dimensions (1).

Another ground rule was: "Thou shalt reinforce each year." In the second year, we had required curriculum time for lectures and laboratory exercises. For example, in one of these exercises, students calculated the cost of care of patients in the university hospital by using the bills of discharged patients.

In the third year, in lieu of Saturday morning classes, students were required to fill in three preventive medicine case summaries on patients assigned to them on each of the major clinical rotations—medicine, surgery, and pediatrics. The students were required to

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describe graphically the prior natural history of the disease or problem of the patient, to estimate its prevalence in the population, and to describe interventions directed at primary-secondary-tertiary prevention (2).

We also observed the basic rule of academic survival: "Thou shalt study, analyze and publish everything you do."

In the Employee and Student Health Services, the medical and other health professional students were seen only by faculty members. Here we practiced what we preached—screening, skin testing, and other applications of preventive medicine.

In retrospect, we did not pursue our inquiries into the students' health habits or behaviors as aggressively as we should have. We were concerned too much with illness behaviors. Also, we neglected to teach students certain key aspects of personal health promotion.

During the period before 1955, which I call the didactic-teaching era of preventive medicine, we taught a lot of content. The content covered the subject matter contained in the Test on Public Health and Preventive Medicine of the National Board of Medical Examiners.

In 1965, the first cohort of student activists arrived in medical schools. Having had their basic training in colleges and universities, they were well-prepared to

attack our relatively unchallenged bastions of tradition. At the same time, the Federal Government made great efforts to increase the access to care of the disadvantaged and underserved in our population. As a result, medical schools had to join forces with communities. Often, departments of preventive medicine were the first to do so, most of them voluntarily. As a result of these liaisons, many departments of preventive medicine became transformed nominally, if not structurally, into departments of community medicine.

More important, I believe, was a major change in the nature of our teaching activities. We began to lecture more about access and equity and became advocates for certain programs and values. Although I share these values, I believe we moved away from a primarily didactic mode of teaching to an affective approach—which I am not sure is the most effective means of communicating to students about disease prevention and health promotion. The period from the mid-1960s until the late 1970s, I would label the attitudinal teaching era of preventive medicine.

In 1969, I left the University of Kansas for what proved to be an unscheduled sabbatical at Harvard. Within a year or two, all of the elements of the department of community medicine at Kansas had vanished, including the title of the department.

As a result of my Kansas and Boston experiences, when I moved to the University of California at Los Angeles in 1970, I was convinced that the principles of prevention could be taught best within the mainstream of a department of medicine. That is, unless what "we" taught was validated by the clinical departments, or even taught by "them," it would continue to be of marginal interest to most medical students.

In 1972, David Solomon became Chair of Medicine at UCLA, and he agreed to support the development of what has become the Division of General Internal Medicine and Health Services Research, 1 of the 14 divisions of a very large Department of Medicine. With his unflagging support, this division became the second-largest unit within the department.

The division is responsible for the training of our house staff and the operation of the Clinical Scholars Program and the UCLA Health Services Research Center. I believe that over the years we have affected the environment of the department and even that of the medical school.

We also serve a brokerage function for other parts of the university—a place where clinicians can find direction to appropriate potential colleagues on the upper campus. In turn, faculty from the Graduate Schools of Management, Sociology, and others can find a translator who speaks conversational "sociologic-ese" or whatever serves as a guide to the strange world that is the hospitals and the clinics.

While we have had an impact on postgraduate training in medicine at UCLA, we have done little or nothing to alter the undergraduate teaching of preventive medicine. Why? First, because I believed the environment of the Department of Medicine needed to be supportive of any change that would occur. Second, the basic laws of thermodynamics state that one can only do so much at one time. And finally, I personally was really not sure until recently what should be taught about health promotion and disease prevention in undergraduate medical education, and how best to do it.

Prescription for Teaching

My prescription for teaching is based on the following series of facts, assumptions, and beliefs:

—Medical students, like the general population, have a variety of styles of cognitive processing. Some deal easily with abstractions; some others have low tolerance for those intellectual activities that do not result in clear-cut decisions, that is to cut or not to cut. Not everyone learns in the same way (3).

—Medical students enter the socialization process called medical education as a rather unusual subset of the

laity. They possess a set of personal health-related beliefs and behaviors that are not dissimilar to those of similar ages and sociocultural backgrounds.

—These health-related beliefs and behaviors are affected, unfortunately adversely, by the process of medical education. Data on the frequency of use of health services (for illness episodes) of medical students at the University of Kansas (4) showed a marked increase in the rate of visits among second-year medical students (a phenomenon familiar to all of us), followed by subsequent marked reductions in use of services in the clinical years. Students who were rated "unsatisfactory" on their clinical rotations disappeared more rapidly from the health service than did their colleagues who were not in academic difficulty. One might have suspected the reverse, since there is considerable evidence that psychological distress increases the rate of use of health services (as seen in those who were referred for psychological counseling).

—Physicians in general have illness behaviors that are less consistent with health than the most disadvantaged members of society. For example, physicians delay seeking care longer than other subgroups in society when faced with symptoms suggesting a potentially serious illness (5). When physicians select a personal physician, they often choose one less competent than themselves (6). There are few data on physicians' rate of compliance and even fewer on their use of health services.

—Physicians are important legitimizers-promoters of prevention. Face-to-face counseling about health-related behaviors by physicians increases peoples' adherence to those behaviors. In the Stanford Three-Community Study, those patients counseled by physicians about health habits demonstrated less recidivism than those exposed to other forms of health education (7).

—Physicians' counseling practices are closely related to their own health habits. A study recently conducted at UCLA by one of our clinical scholars, Dr. Kenneth Wells, examined the personal health habits of physicians, their counseling practices with patients, and their belief in the efficacy of counseling (8). In brief, Wells found that physicians tend not to counsel patients about habits which they themselves possess. For example, physicians who believe that they drink too much do not counsel patients with liver disease about alcohol. The intervening variable is the physicians' lack of belief in the efficacy of that form of counseling (at least by them).

On an anecdotal basis, most of us are aware of colleagues who are enthusiastic about their counseling and health promotion activities. We know them because they bicycle to work (through hazardous traffic)

and bound up 14 flights of stairs (often carrying their bicycles). They are conspicuous in terms of their dietary habits and their insistence on eliminating smoking from hospitals and their places of work.

—We have more knowledge about the specifics of prevention than ever before. For example, in a talk entitled, "What is the Evidence?" 10 years ago, I noted the lack of evidence for the efficacy of treating mild hypertension (9). The data now are available to support a more aggressive effort in treatment.

We have more specific information that permits us to be more targeted in our efforts. For example, the relations between health and obesity have recently been summarized by Stewart, Brook, and Kane as part of the Rand studies in Santa Monica, Calif. (10). They note that the physical and psychological effects of being overweight are a nonlinear function of the severity of the weight problem. Pain, worry, and restricted activity are greatly increased among those who are markedly overweight. There are significant associations between weight and prevalence of diabetes and incidence of mortality related to that disorder. While the evidence is less striking, the same probably applies for coronary heart disease. Also, there is a negative and linear association between the prevalence of hypertension and angina and body weight. Stewart and associates cite only three studies in the literature on the effects of weight loss on health status. Two studies examined the effect of weight reduction on blood pressure levels. In all three studies, beneficial effects were observed; however, the followup period was less than a year in two studies, and in the third, it was not specified.

—Knowledge is not sufficient cause for behavior change.

—Attitudes and beliefs are to some extent related to health behavior.

—Attitudes and beliefs tend to be unaffected by didactic or intellectual experiences. There is no evidence that courses in culture result in enhanced compassion. I also know of no evidence that any number of courses in the humanities results in an increase in altruistic or humane behavior.

—There is increasing evidence that increased access to health care services, particularly those provided by physicians, can result in a diminished sense of self-reliance or "learned helplessness."

We recently examined the effect of facilitating school children's access to health care (11). A small fraction of "high utilizers" (about 10 percent of all student groups we have examined) accounted for 50-60 per-

cent of all visits for care. In this group, the rate of pretending to be ill increased by 100 percent when students were given increased opportunity to explore the exemption associated with assumption of the sick role. With increasing numbers of physicians in our communities, the capacity for induced, learned helplessness is considerable.

—I believe that most, if not all, students who enter medical schools are interested in people. They have, at least initially, the orientations desired.

—I believe most medical school experiences are destructive to the health of our students. There is considerable stress without the provision of preventive mental health services. We also eliminate opportunities to practice relaxation and physical exercise and to pursue many of the health habits we hope young physicians will promote among their patients. I believe we need to ask, "Who cares about the health of medical students as individuals?" "Does anybody care about them as role models?"

—A noncognitive component often overlooked in the teaching of patients and students is the learning and practice of certain skills. We focus heavily on the cognitive dimensions of education. We express concerns about students' motivational or attitudinal orientations. However, certain behaviors require the performance of skills. A good number of techniques in health promotion require skill training, including exercise and stretching, muscular relaxation, meditation, visual imagery, and, above all, the skills of rational decision making.

Synthesis

Where does this collection of statements take us? How do we compound a prescription?

First, we must demonstrate greater concern over the health and health behaviors of medical students, as future physicians, as well as existing practitioners. We must apply our concern with worksite prevention to our places of learning, that is, teaching hospitals. We must see students as future transducers of prevention, as well as personal beneficiaries.

Second, we must increase our teaching of skills: the skills of counseling, the skills that permit someone to do more than tell a patient to go out and exercise or go home and relax. It is the lack of specificity, the lack of opportunity to demonstrate exactly what one means in these prescriptions, that may be associated with the lack of efficacy of physician-provided preventive services.

Third, we must sensitize our students to their power, the power of medicine to induce disability and de-

pendence, as well as to cure or to care. We have heard that return to work after a significant impairment, such as a myocardial infarction, becomes less frequent the longer the patient is away from work. I suspect that the predischARGE exercise testing of patients who have had acute MIs is not only useful in terms of projecting a prognosis—it reinforces patients' sense of ability as well, rather than emphasizing their disability.

Fourth, we need to stop thinking and talking in generalities about prevention and focus on the specifics. Exactly for whom and at what level of excess weight does obesity become a health problem? Exactly what skills are useful and effective in counseling?

Fifth, given their past preparation for prevention that exists in practice, we must be careful not to place a guilty label on physicians or condemn them too much for their failure to practice preventive medicine on a continuing basis.

In view of the amount of work to be done, as well as the abilities of physicians to do this work, perhaps one of our objectives ought to be to convince medical students that the primary role of the physician is to legitimize and emphasize the value of certain preventive practices, rather than to try to be the one who has to demonstrate or teach these to all patients.

In our research related to the teaching of children about the self-management of their illnesses, we found that physicians are poor instructors. Their professional education often disqualifies them as effective, simple communicators. They have too much information; they are too concerned with details. We have designed all of our curriculums to be taught by primary school teachers. Physicians specify the content and provide positive encouragement, at appropriate times.

To estimate the burden of prevention present in a primary care practice, I engaged in a small exercise. I used data from the Family Practice Survey conducted by the Robert Wood Johnson Foundation and the University of Southern California (11) and the recently published data from a national survey of the health practices of adults (12).

The data from the University of Southern California study suggest that during a week of practice, family physicians in their sample had 102 outpatient encounters and 35 inpatient encounters. I translated that to caring for 5 inpatients and about 85 ambulatory patients, or 90 persons in all. Of this group, 67 or 76 percent were over 20 years of age. One third of them were men; two-thirds, women.

Using data on the health practices of adults about the proportion of people who believe that they are overweight, who feel that they do not exercise enough, who

smoke, who drink "a lot," and who are under a great deal of stress at work, the following estimates are derived. In 1 week that family practitioner will see 22 women and 7 men who believe that they are considerably overweight; 2 women and 11 men will say that they do not exercise enough; 13 women and 9 men will be smokers; 2 women and 5 men will consume more alcohol than they believe they should; and 11 women and 5 men will be under a great deal of stress at work. All of this sums up to 100 person-habit-risk factors per week. If one were to counsel each patient about just these problems, the average length of an office visit of 13 minutes would change considerably.

Discussion and Conclusions

I can summarize the prescription for teaching in another way. I spoke of trying to create teachable moments for patients as well as medical students. I believe there are critical times in the life history of people, including students of medicine, when certain kinds of experiences related to prevention should be provided or programed. I said "I believe" to indicate the lack of hard evidence for the efficacy of all of the elements of this prescription.

For example, if we wish to affect the formation of health-related beliefs and behaviors, we probably need to begin, if not at the moment of conception, soon thereafter. Parenting styles are associated with the development of these, with autocratic parents producing more than their share of children with poor self-concept, problems in making decisions, and dependency needs (13). There are programs that provide training in parenting. Do present and future physicians know about these and how to make appropriate referrals?

I could proceed with a litany of examples for patients, if space permitted. However, I wish to focus on what we should teach or do to undergraduate medical students to enhance their competencies in prevention.

We must begin by recognizing the limits of what can be done within the scope of medical education. Students must master an enormous fund of information related to the basic mechanisms of cellular function and dysfunction. Mastery of this content is, and always will be, their primary concern. Application of it—learning how to elicit and use the resultant data base in order to establish a diagnosis—constitutes their primary concern in the clinical years. They then learn how to apply and use an increasingly complex and costly therapeutic armamentarium as house officers.

We can and should expect students to learn how quantitative information is used and interpreted. Without overdoing it, we can and should expect them to

understand the principles underlying the study of the distribution of a phenomenon in a defined population, for example epidemiology. I believe that both biostatistics and epidemiology are more effectively taught to medical students with examples drawn from clinical medicine. However, unless carefully integrated, these subjects will be viewed as disposables. No one (to my knowledge) ever has failed a year in medical school solely because of poor performance in preventive medicine.

There is much to be taught about the prevention of disease, as well as a need to expose some of the many myths about prevention. I believe these should be taught, after presentation of a few principles and concepts, in conjunction with or as part of the clinical practice of medicine. A case of lead poisoning is exciting in terms of the metabolic effects of the lead on several vital systems. The same case can be just as exciting when seen as a public health disorder.

The hematological effects are always discussed (by the resident hematologist); a discussion of the pathophysiology of lead smelters and their potential impact on children's brains requires a different subspecialist—one who seldom makes rounds or even exists in most teaching hospitals.

Learning about the content of prevention, like the rest of medicine, is a lifelong pursuit. It need not and cannot be mastered at the undergraduate level. Rather than emphasizing only content, we need to provide training in those skills necessary to practice prevention. Again, these include the therapeutic use of self, through interviewing and counseling, and the skills of personal self-care related to exercise and stress reduction.

Most importantly, rather than focusing solely on the host or patient and the agents of prevention, we must create environments where we can teach students to practice health promotion on themselves. This is not just for personal benefit, but also to achieve the secondary gains when "believing" physicians care for patients who look to them for guidance.

We must pay more attention to the physical and social environment of medical education. We must look at the extent to which we are promoting unhealthy conditions for body or mind. Grinding someone to physical and mental exhaustion cannot be justified as "good for them," "a test of character," or, worse, "because that's the way they did it to me."

Finally, we must remind students of a variant of the admonition to first do no harm, that is, first, to create no unnecessary dependence. Over the coming years, I predict we will have increasing evidence of the untoward effects of excess care—not just in terms

of costs or adverse reactions to procedures and drugs, but also in the loss of self-reliance and self-respect by patients.

The current Administration is concerned with cost control. Part of that can be achieved through a reduction in unnecessary utilization. Perhaps the Administration's twin goals of health promotion and cost containment can be achieved if we prevent the development of dependency and instead focus on a system that promotes self-reliance.

This prescription will not be easily filled at your neighborhood medical school. However, it may stimulate others to synthesize their own remedies. I only hope that these remedies will have more than the placebo effect that all of us have depended on in the past in our efforts to treat the ultimate beneficiaries of medical education.

References

1. Lewis, C. E.: Studies of the effects of multidisciplinary home care teaching program on the attitudes of first-year students. *J Med Educ* 41: 195-201, March 1966.
2. Lewis, C. E.: Use of preventive medicine case summaries; analysis of 1400 reports. *Arch Environ Health* 14: 899-903, June 1967.
3. Lewis, C. E., and Easton, R. E.: Personality characteristics, career interests, observed health behavior, and the teaching of community medicine. *Arch Environ Health* 21: 99-104, July 1970.
4. Lewis, C. E.: Academic performances and illness behavior in medical students. *Arch Environ Health* 12: 776-780 (1966).
5. Hackett, T. P., Cassem, M. H., and Raker, J. W.: Patient delay in cancer. *N Engl J Med* 289: 14-18 (1973).
6. Bynder, H.: Doctors as patients: a study of the medical care of physicians and their families. *Med Care* 6: 157-167 (1968).
7. Farquhar, J. W., et al.: Community education for cardiovascular health. *Lancet* 2: 1192-1195, June 4, 1977.
8. Wells, K. B., and Lewis, C. E.: The relations of physicians' personal health habits and attitudes to patient counseling (abstract). *Clin Research* 29: 327A, April 1981.
9. Lewis, C. E.: What is the evidence? *Am J Dis Child* 122: 469-474, December 1971.
10. Stewart, A. L., Brook, R. H., and Kane, R. L.: Conceptualization and measurement of health habits for adults in the health insurance study (Vol. II: overweight). *Rand/R-2374/2-HEW*, July 1980, p. 152.
11. Lewis, C. E., Lewis, M. A., Lorimer, A., and Palmer, B.: Child-initiated care: the utilization of school nursing services by children in an "adult-free system." *Pediatrics* 60: 499-507 (1977).
12. Mendenhall, R. C.: Final report, the family practice study report. Division of Research in Medical Education, University of Southern California School of Medicine, Los Angeles, August 1978, p. 173.
13. Highlights from wave one of the national survey of personal health practices and consequences: United States, 1979. DHHS Publication No. (PHS) 81-1182. U.S. Government Printing Office, June 1981, p. 52.