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PREVENTIVE MEDICINE: AN ATTEMPT AT A DEFINITION¹

By GEDDES SMITH and LESTER J. EVANS, M.D.

THE COMMONWEALTH FUND

THE relief of pain is an important function of medicine. It is often the physician's first duty to "make the patient comfortable." As soon as clinical medicine gets beyond this palliative stage, however, it becomes preventive medicine. The major function of the physician is to hold disease in check lest disability or death result from it; in other words, to prevent the graver consequences of dysfunction. While it is possible to distinguish between preventive and palliative medicine, it is difficult and generally unprofitable to draw a line between preventive and curative medicine. To cure disease is to cut it short—to prevent its continuance—and so to prevent the consequences of its continuance. Preventive medicine might logically be defined as *all* medicine that seeks to alter the course of disease or to better the patient's physiological status.

¹ A memorandum prepared in connection with the activities of The Commonwealth Fund.

For practical purposes, however, the term has commonly been restricted to mean the intervention of the physician or his technical allies in a limited range of situations in which specific diseases can be warded off or specific deterioration of the patient's condition can be forestalled. Such service is possible (at the present stage of medical science) at three different levels which will be considered in turn.

The most conspicuous field for the operation of preventive medicine is communicable disease. All disease is the result of a chain of causes, but in infectious diseases a uniformly essential link in this chain is found outside the body and, in varying degree, is accessible to attack. The external cause can be neutralized by destroying the infective agent outside the body (*e.g.*, killing typhoid bacilli in water) or by specifically increasing the body's resistance to a particular invader (as by immunization against diphtheria). If more were known about the internal fac-

tors in the causation of communicable disease—the factors which make one patient susceptible while another remains resistant—preventive medicine could no doubt do a better job in this field, but the rewards of diligent attack on the accessible external factors are very great (*e.g.*, the establishment of virtual control over yellow fever).

Preventive medicine occupies a like position with respect to the diseases caused by dietary and particularly vitamin deficiencies. Clear-cut prevention of a specific disease is sometimes possible (*e.g.*, the prevention of scurvy by including lime-juice in British naval rations, begun in 1795) and the wide extension of preventive measures of a similar sort waits only upon the growth of exact nutritional information and the development of adequate tests for marginal deficiencies.

The first level of preventive medicine is then the prevention of obviously preventable diseases. But if preventive medicine be limited to this function much of its significance is lost. It has an important role to play in curable chronic diseases whether or not these are preventable. This is true with respect to the two great chronic disabling diseases in the communicable group—syphilis and tuberculosis. Quite apart from the need for averting the incidence of these infections by public health measures (which of course form part of preventive medicine), preventive medicine is concerned with their early recognition and treatment lest they go on to disable or kill the patient. Prompt and aggressive treatment—a purely curative process—takes on a strongly preventive coloring because it may forestall serious deterioration or death. This is true also of cancer, a non-preventable disease of unknown cause which can nevertheless be cured in many instances by surgical removal or radiological destruction of the lesion. The full use of modern diagnostic facilities permits such intervention at a profitable stage in many cases of cancer which would otherwise go unrecognized until they were incurable. The gastro-intestinal x-ray study which a careful diagnostician orders when confronted with certain abdominal symptoms is thus an important tool of preventive medicine. There are indications, too, that some psychoses will yield to treatment with convulsants (insulin, electricity, etc.) if such treatment is given early enough, and preventive medicine may yet concern itself effectively with frank mental disease as well as with mental hygiene (of which more later). It is the time-factor which makes these conditions of special interest to preventive medicine; early and successful intervention pays large dividends in the prevention of later morbidity and mortality. At this second level, however, preventive medicine is handicapped by the paucity of methods suitable for routine

use in the prompt recognition of incipient chronic disease, and so must be largely opportunistic.

It is possible to prevent the preventable diseases, and to prevent some of the consequences of curable chronic diseases. It is also possible to prevent or delay some of the consequences of non-preventable and non-curable diseases, and this is a third level of preventive medicine. Cardiovascular disease is certainly not preventable in the sense that malaria is preventable, and it is not curable in the sense that cancer is sometimes curable. So far as is now known, there is no extrinsic factor accessible to attack, no ruling deficiency in diet, no localized lesion which can be extirpated. It lies enmeshed in a web of physiological controls which as yet the investigator can not trace. And yet because it is a chronic condition intimately affecting the daily behavior of the patient preventive medicine has a notable opportunity to influence its course. The task is to fit the patient's way of life to his physical resources so that he will live as usefully, as happily, and as long as his condition permits and will not squander his resources in overexertion or underexertion or in emotional conflict. Telling a man with an overstrained heart to stop lugging ashcans up and down cellar stairs is preventive medicine of a very simple sort. Releasing him from tensions growing out of family incompatibility or the fear of early death is a subtler way of accomplishing a like end. Both procedures tend to prevent the waste of human energy, if not the exacerbation of the disease itself.

This fairly specific task merges into a more general one. Since the hazards of communicable disease (partly because of better control of the environment, partly because of the successes of chemotherapy) are definitely on the wane, the major task of preventive medicine now is the maintenance of physiological tone in the hope of delaying, mitigating, or if possible preventing those degenerative and senescent changes which account for most deaths in the later adult years. Physiological tone is so intimately connected with emotional balance that psychiatry of a dynamic sort—the sort that addresses itself to the relief of emotional stresses in non-psychotic persons—is an indispensable ally of preventive medicine at this level. Yet it can not be said that in general the natural history or the basic causes of these degenerative changes are well enough known to give the clinician a clear course to steer by. He must feel his way. For the present preventive medicine must stay close to the early-recognition-prompt-intervention-protective-regime range of clinical service, and clear-cut prevention of specific disease processes or their ultimate consequences is seldom possible. However, medicine is an art that has always pushed beyond the frontiers of medical

science and this range of service is well worth cultivation even if it remains empirical and falls short of complete success.

As one multiplies the possible applications of preventive care to the treatment of incipient or established disease, preventive medicine becomes all but indistinguishable from good clinical medicine in general. Better diagnosis, prompt intervention in diseases or disorders which can be arrested or relieved, the intelligent adjustment of the patient's behavior to his physical and psychological assets—these are the objectives of good practice everywhere and under any name. The logical culmination of what is called preventive medicine, however, transcends the traditional function of medicine, which is to heal the sick. Hygiene is a slightly tarnished word, perhaps because it has been bandied about by relatively unskilled and sentimental people before its scientific underpinnings have become quite secure. But the building and maintenance of health—that is, optimum physiological status—is a goal not unworthy of medical art and science. When genetics, physiology and psychology can be integrated and put to work to develop top-flight human beings and keep them at their best throughout a normal life-span, the prevention and cure of disease will fall into their proper place as subsidiary and not primary objectives, and medicine will become constructive rather than remedial or preventive. All this at the moment has a utopian sound, and a vast amount of investigation is needed before it can become a reality. The best indication that it might become a reality is the progress pediatrics has already made toward focussing scientific and clinical attention on normal growth and development.

Some degree of professional reorientation is needed even at present levels of preventive medicine. It is impossible for a physician to grasp the opportunities already mentioned in these notes without taking rather more initiative than physicians have usually felt free to take with their patients, and without thinking in terms of persons who are patients rather than in terms of diseases which occur in patients. The last generation in medicine thought hard about diseases and learned much about them, and worked hard at the physiology of organs and tissues. The era of scientific medicine has been devoted to the intensive exploration of narrowly defined areas. This was inevitable; exact knowledge could have been gotten in no other way. Unfortunately this singleness of purpose has created as a by-product a sharp parochialism in medicine and in medical schools, so that above the general practitioner level (or below it) there is growing lack of cohesion and integration. Medicine is too much departmentalized. In dealing with com-

municable diseases preventive medicine seeks to reconcile the clinical attitude toward the feverish child with the public health attitude toward a disease that sweeps through the crowd. In dealing with chronic and especially degenerative diseases it seeks to integrate the probing of physiological details with an overall awareness of the patient's life as a problem in itself. The practice of preventive medicine requires a change in viewpoint quite as much as the acquisition of specific techniques.

The teaching of preventive medicine is therefore a complex task. The techniques involved would not by themselves justify the establishment of a separate department to teach them. The purpose of such a department is to influence the flavor and emphases of medicine rather than to alter its content. Once established, however, it attracts to itself various tasks, some central to its purpose, some assigned to it merely for convenience.

The control of communicable disease has an obvious place in this curriculum. Since that involves organized public health service, the department of preventive medicine needs contact with public health agencies and is responsible for acquainting the medical student with their work at large and with public health procedures which form part of private practice—notably the techniques of immunization. The part which the individual physician has to play in controlling an epidemic may be small, but a knowledge of the way in which communicable disease spreads is or should be a stimulus to better clinical management of such disease in the individual patient. For this reason, and for the contribution which the study of disease as a mass phenomenon can make to medical philosophy, the study of epidemiology is usually included in the preventive medicine curriculum. Biostatistics finds place there too, partly because it is an essential tool of epidemiology, partly because it is useful to any physician who expects to do scientific investigation or to evaluate the scientific work of other clinicians. It is taught in the department of preventive medicine chiefly because no other department has recognized its importance or has been competent to teach it.

More closely related to the major objectives of preventive medicine is the task of personalizing clinical medicine. This the department would have to undertake for its own ends even if the job had not gone by default in other departments where it is equally needed. Poverty and social maladjustment are certainly not preventable in terms of any individual doctor's efforts, but the effects of these factors and of emotional stresses generally on the physical status of the patient greatly need to be brought to the attention of the medical student. Hence the courses, now

familiar in a number of schools, in which senior medical students visit the homes of clinic patients to study and report on their environment and the emotional background of their diseases. These are five-finger exercises in personalized clinical care; they should be reinforced by more difficult and more significant tasks set by the student's instructors in psychiatry.

The core of preventive medicine—the adjustment of the individual patient to his physiological equipment and status—can hardly be taught successfully in didactic courses. The student needs to see his instructor handling patients in the clinic and at the bedside in a way that makes full use of the resources of medicine for bringing about such an adjustment—resources which are still all too meager for the infinite variety of the task. The department of preventive medicine can not hold itself aloof from other clinical departments if it is to do and to promote such teaching: its members must take their places on the clinical team of the teaching hospital and do their part to enrich general medicine rather than attempting to build up a separate discipline.

The task of the department of preventive medicine, in sum, is then:

- (1) To teach the medical student what he needs to know about available techniques for the prevention of communicable disease;
- (2) To give him an understanding of epidemiology and quantitative methods in medical science;
- (3) To sensitize him to opportunities for arresting the development of non-communicable disease;
- (4) To make him aware of the patient as a person and thus to initiate him more fully into the art of medicine; and ultimately
- (5) To show him how medicine can help to maintain or increase productive energy in both normal and handicapped individuals.

It will be seen that these objectives can be translated only in part into a formal curriculum. The more significant service of the professor of preventive medicine is to act as catalyst—offering new points of view, broadening clinical concepts, stretching the imagination, and nourishing the philosophy of both his students and his colleagues.

OBITUARY

WILLIAM SPENCER CARTER 1869–1944

INCREASINGLY significant is the influence of American medicine in the development of medical training and research in outlying parts of the world. A notable pioneer in transfusing the best of American medical idealism and methodology in the Pacific area was William Spencer Carter, who died in Auburndale, Mass., on May 12, 1944.

Dr. Carter was a leader in the development of clinical physiology, an outstanding medical administrator, and a generous guide in promoting medical education and research.

Born in Warren County, N. J., on April 11, 1869, Dr. Carter graduated in medicine from the University of Pennsylvania in 1890. As a medical student he had worked in the private laboratory of Dr. Isaac Ott at Easton, Pa., on cerebral heat centers. Following the receipt of his degree in medicine he became demonstrator of pathology at the University of Pennsylvania. In 1894 he was assistant professor of physiology at Pennsylvania, and in 1897 he came to Galveston as professor of physiology at the University of Texas Medical Branch. At Galveston Dr. Carter organized one of the first physiology laboratories in the South.

Dr. Carter's executive ability was recognized in 1903 when he succeeded the late Dr. Allen J. Smith as dean of the University of Texas School of Medicine, Dr. Smith having returned to the University of Penn-

sylvania. Under Dr. Carter's administration the University of Texas School of Medicine developed effective leadership in medical education and research in the Southwest in intimate association with the John Sealy Hospital.

At the request of the Rockefeller Foundation, the University of Texas lent Dr. Carter in 1922 to the University of the Philippines, Manila, where he assisted in the organization and development of the medical school. In 1923 Dr. Carter became associate director of the Medical Sciences Division of the Rockefeller Foundation. As such, he made an important survey of medical education in the Philippines, Australia, South Africa, Java and New Zealand. In 1925 Dr. Carter became acting director of Peking Union Medical College, where he assisted in the notable expansion of medical educational efforts in China. In 1926 he went to India to make an official survey with recommendations for the future of medical education in that area. He was instrumental in the establishment of the School of Tropical Medicine at Calcutta.

Dr. Carter retired from work with the Rockefeller Foundation in 1934. Shortly thereafter he returned to the University of Texas to serve again as dean of the Medical Branch until 1938, when he retired to his home in Massachusetts.

Dr. Carter had come originally to Galveston in connection with yellow fever work. At the University