

# Proprieties of Tuberculosis Management

By W. M. PECK, M.D.

THE PATTERN of tuberculosis control changes constantly. It changes in response to new information and needs, altered economy, predominant personalities and fads. Sometimes it flounders in complacency; other times it changes with almost chaotic flurry. But always guiding and determining this pattern are three components, the health department, the private physician, and the sanatorium, each performing a specialized function.

Since tuberculosis, as a contagious disease, is essentially a public health problem, the health department must occupy the position of overall responsibility and initiative. The private physician must guide the attitude of the patient and his community and plead the right of the individual. And the sanatorium, with its clinical and laboratory resources for research, must work out new methods of treatment and new concepts to support a changing and progressive program. Yet it is true that sanatorium physicians, in their more or less monastic seclusion, speak mostly to other sanatorium physicians, and public health physicians may be equally guilty of similar parochial practices. Since we are now in one of the more chaotic periods of change with aspects that are both heartening and hazardous, it is important that

these groups maintain the closest possible communication with one another so they may work together wisely and with adaptability through this unusual period of turbulence.

Up to now it has been customary to assert as a dictum that the basic philosophy of treatment has changed little and that drug therapy and surgery are only serviceable adjuncts to an established and time proved system. But now we must recognize that the basic philosophy itself is changing and that this constitutes the most radical departure in the changing pattern of control.

The traditional concept, which is now giving way, was starkly realistic and recognized the uncertainty of predrug therapy and the fact that tuberculosis was essentially a relapsing disease. It aimed at bringing the patient into tentative equilibrium with his disease and at maintaining that precarious balance by sheltered, restricted living. It was harsh treatment. When a patient entered the sanatorium there was forced on him a sudden break in the continuity of his life. Life plans were stripped from him and reconstituted along lines of minor attainment and little responsibility. The usual values were inverted: ambition became evil and laziness a virtue. There was a suggestion of other-worldliness, of Magic Mountain mystery about the treatment, a certain ecstasy which sustained the patient without realism and eventually enervated him. He was taught the doctrine of submission and introduced to the numbing despair of relapse through such slogans as "once tuberculous, always tuberculous." Some patients survived their illness to acquire success or even greatness, but many succumbed

---

*Dr. Peck, presently serving as chest consultant for the North Carolina State Board of Health, Raleigh, was previously medical director and associate superintendent of the North Carolina Sanatorium, McCain. He is the current president of the Southern Trudeau Society.*

---

to the trivial life of semi-invalidism. Thus the "cure" in days when there was no justifiable alternative.

But since then, in a matter of a very few years, a nearly specific group of drugs has appeared, changing the course and behavior of tuberculosis to an extent that it has little in common with the disease we knew only 10 years ago. Such fundamental aspects as its pathology, bacteriology, and perhaps even its epidemiology have been altered by drug action. The significance of these changes we have been slow to recognize and accept because of our innate distrust of the disease and its record for relapse. But now we are beginning to see that with optimal treatment recovery is nearly predictable and that the relapse rate—if we can project short-term results—has dropped almost to the point of removing tuberculosis from the category of a relapsing disease.

This is a difficult adjustment for all of us to make, but obviously we, who deal with tuberculosis, must "catch up" with this new type of disease and exploit its changes for the benefit of the patient and the control program. The period of hospitalization has already been shortened considerably and, as we gather confidence, probably can be shortened more, perhaps very much more. Patients now return to work within a few months of discharge and usually to their previous employment. The need for treatment in tuberculosis, then, no longer should be regarded as an overwhelming personal tragedy, and the period of sanatorium care, though intense and highly specialized, should be regarded merely as an episode which, in itself, does not disrupt or materially alter the continuity of one's life.

These optimistic remarks, of course, cannot apply to all who enter a sanatorium. Belated diagnosis and delayed admission still carry some patients past a point of possible return of adequate function. Some of these still die from tuberculosis; others survive as pulmonary cripples to whom one can offer only prolonged custodial care.

### **Treatment Regimen**

Let us turn now to the treatment which has justified such a reversal of concept.

The goal of drug treatment, ideally, would be to sterilize the lesion of all tubercle bacilli with reversion of the tuberculin reaction. But under usual clinical conditions with our available drugs, this goal cannot be fully realized. Fortunately, there is a tangible alternate goal which falls just short of ideal. This is based on the faculty of drugs, especially of isoniazid, to destroy those bacilli which are in an active phase of multiplication and to depress the metabolic activities of the remaining organisms to a point of inertness, comparable, perhaps, to hibernation—a unique and definite vegetative state. Bacteriologists have shown that many of these bacilli cannot be induced to grow on culture media, whereas others will grow with difficulty only after many months of incubation or with special stimulation. In this dormant state tubercle bacilli continue to produce sufficient tuberculoproteins to maintain a positive tuberculin reaction but not enough to cause progressive disease. Rapid resolution of pneumonic disease and, frequently, cavity closure occur in consequence of this depressed state of the parasite; and we may postulate that host factors—factors which unfortunately permitted disease to develop in the first place—may have opportunity to rectify themselves.

Isoniazid is by far the best drug, and isoniazid and para-aminosalicylic acid seem to be the most satisfactory combination. Drug therapy is usually initiated by these two, and with almost predictable success. When they fail—as they do rarely under favorable circumstances and frequently under conditions of compromise—one loses much of the sureness, and treatment henceforth becomes difficult, specialized, and less certain. Then one must grope with problems of drug resistance, synergism, and toxicity in seeking successful combinations with streptomycin, cycloserine, pyrazinamide, or viomycin. Sometimes the surgeon must remove refractory areas of disease, the persistent cavity or the caseous mass, before sputum can be converted.

The achievement of the dormant state of the bacilli is the first objective, and the second objective is to maintain them in this state. Fortunately, it appears that dormancy can be maintained by the rather simple expedient of continuing drug therapy. Isoniazid by itself

appears to be adequate for this purpose, and ideal since it is pleasant to take and exceedingly low in toxicity and cost. Probably, continued dormancy can be further assured by the prophylactic removal of those areas prone to reactivation such as residual cavities or areas of unresolved disease which may be relatively inaccessible to the blood stream and hence to drug effect.

The tragedy of drug therapy is the ever-present possibility of interruption or compromise in the early course of treatment. The initial exposure to drugs finds the organisms particularly vulnerable. And intense, supervised drug therapy at this time will cause sputum conversion in about 80 to 90 percent of patients in the first 4 months. On the other hand, if initial therapy is inadequate or interrupted, it may have the deplorable effect of merely altering the host-parasite relationship sufficiently to produce a remarkable degree of chronicity, with active, smoldering disease persisting. It may neither improve nor worsen with further treatment.

Usually, there are about 40 such patients in the 700-bed North Carolina Sanatorium at McCain, N. C., many of whom are in its prison division. For the most part they are poor, defeated creatures with long histories of repeated "short bursts" of drug therapy. Characteristically, their shopworn lesions have practically ceased to respond to drugs, even to new ones, such as cycloserine, yet under flagrant abuse they seldom get worse. Prisoners escape and run for hours or days through the swamps. They go on the bum or work at heavy construction for months before being apprehended and returned, still hale and hearty, but with sputum that is unalterably positive. This kind of disease is the stigma of erratic drug therapy and may be produced in the well-meaning, law-abiding citizen as well as the criminal. There is a heavy responsibility on all of us lest, inadvertently by compromise or misdirection, we encourage another to join this forlorn and hopeless crowd. One must never forget that the period of early treatment is a critical one, and the difference between adequate treatment and almost adequate treatment may be relatively slight.

Assurance of proper treatment during this

early crucial period can be given best if the patient is admitted to a sanatorium. Once the organisms presumably become dormant, when the sputum becomes negative and resolution is well under way and any needed surgery is accomplished, the situation alters and much greater latitude is possible. This permits earlier discharge home and earlier return to work under the continued protection of isoniazid for a prolonged period of time, possibly for 1 or 2 years or longer; and this can be done with a degree of safety that is foreign to all earlier experience.

### The Home Care Question

This treatment represents the ideal way for handling the tuberculous patient, and one cannot depart far from the ideal without some jeopardy. The question of home care, however, comes up and must be answered. The possibility of treatment at home is appealing to the patient and his relatives and has enough validity even to command critical medical attention. An argument for a home care program might be presented as follows: Drug therapy if carried out conscientiously will cause conversion of the sputum in 80 to 90 percent of initial treatment cases, and it will do this in spite of great latitude in such ancillary matters as bed rest, good nutrition, and psychotherapy. Accordingly, proponents of a program which relies primarily on home care would provide the following:

1. A system of supervision designed to insure uninterrupted drug therapy.
2. Medical supervision which would (a) endeavor to admit to the program only those patients who might be expected to have rapid sputum conversion, (b) remain alert to the development of complications or possibility of treatment failure, and (c) recognize indications for surgery.

These proponents of home care recognize that such a program is not cheap, particularly since the majority of tuberculosis patients require welfare assistance whether in or out of a sanatorium. They recognize that a considerable staff is required, including medical and nursing staff and social workers. Central clinic, roentgenographic, and laboratory facilities must be readily available. Arrangements must be made

for nurses or social workers, or both, to visit the home at monthly intervals. Lansdown and Jones estimated the cost of treating a New York City welfare patient in his home at approximately \$6 a day whereas the cost for a similar patient in a local sanatorium was approximately \$13 a day. This as well as other estimates would indicate that a home care program is about one-third to one-half as expensive as sanatorium care. Thus, the apparent cheapness of a home care program is largely illusory and is dependent on spreading the cost through a number of departments such as welfare, public health, and social service.

Opponents of a home care program point out that most of the tuberculosis patients come from underprivileged, underendowed groups who cannot assume the responsibility for their care under such a sketchy framework of supervision and that serious lapses of drug therapy will occur. Neither do they believe that bed rest, nutrition, and emotional factors are of so little consequence that they can be left to chance, especially in the determination of long-term results as opposed to short-term sputum conversion rates. They doubt that, without ready access to special facilities, sufficient sputum, gastric, or roentgenographic studies would be made for proper evaluation or that the patient could be readily persuaded to accept surgery at an optimum time. They point out, wisely, that enthusiasm for cheaper care in the home must not blind one to the communicability of tuberculosis or to risk of creating false and disastrous attitudes of nonchalance toward public health aspects of the disease.

### **The Reasonable Attitude**

Until further data are presented a conservative and reasonable attitude in this controversy might be:

1. Where sanatorium facilities exist, reliance should be based primarily on sanatorium treatment, with home care restricted to the convalescent period and to patients temperamentally unsuited to hospitalization.

2. Where sanatorium beds are insufficient and health department personnel and facilities are sufficient to increase activities substantially, a home care program should be developed. This

program should be designed with close coordination existing between the sanatorium and home phases of treatment. Under these circumstances most patients would start treatment within the sanatorium for the initial evaluation and indoctrination and for the establishment of a suitable and tolerated drug regimen. After several weeks or months, depending on the demand for beds, the patient might be transferred (not discharged) to the home care program, but he might return to the sanatorium at later dates for periods of reevaluation or for surgical procedures. This is not an ideal program, particularly for patients who must return to forlorn and crowded homes. But it may be justified by circumstances, and it has been reasonably successful as practiced by Lansdown and Jones in New York City, Lichtenstein in Chicago, and others, especially in urban areas where excessive dispersion of the population is not a factor.

The methods of tuberculosis control, then, are by no means immutable since modern drug therapy permits increased flexibility when fundamental principles of administration are respected and accomplished with certainty. The components of a treatment program—the sanatorium, the clinic, the home—may be used with varying emphasis, depending on community resources. Extensive reliance on sanatorium facilities presents the fewest problems and the further one departs from this convention the greater becomes the responsibility, concern, and financial need of the health departments. Programs relying heavily on clinic and home treatment are indeed possible and even justified by circumstances, but they should be undertaken only after sober evaluation of resources and as a major interest. Even so, under carefully controlled conditions, there is justification for further cautious exploration in this direction. There is danger, however, that home care programs may be undertaken somewhat hastily because of a mistaken assumption of great economy, because of popular clamor, or because of insouciance. And there is danger that home care and sanatorium care may be pitted against one another in wasteful competition. Such attitudes must not be tolerated. Instead one must seek constantly to command optimum use of all these community resources.

This concept presents us with opportunity

for building a program on a much broader and more secure base, an opportunity for freshening and strengthening a campaign which has lost much of its momentum, an opportunity for

reawakening those forces which once distinguished tuberculosis control measures as an actual crusade in which the entire community eagerly joined.

---

## Federal Water Pollution Control Act of 1956

Federal grants to assist municipalities in the construction of necessary sewage treatment works as a pollution control and water conservation measure, to be administered by the Public Health Service, are authorized in the Federal Water Pollution Control Act of 1956 (P. L. 660, 84th Cong.).

The act also authorizes up to \$3 million a year for a 5-year program of grants to States and to interstate water pollution control agencies to assist them in developing their own water pollution control operations. A revised Federal enforcement procedure for control of interstate water pollution and greater Federal support for research are among other important provisions of the act.

Under the revised enforcement procedure, Federal court action to abate interstate water pollution may be taken by the Government at the request either of the State in which the pollution originates or of the State affected by the pollution. Under the 1948 act, the consent of the upstream State was required.

The 1956 act also authorizes an intensified program of research, technical assistance, and training. Research work at the Public Health Service's Robert A. Taft Sanitary Engineering Center at Cincinnati, Ohio, will be augmented by means of research grants, contracts, and fellowships.

The statute authorizes Federal grants of \$50 million a year (up to an aggregate of \$500 million) for the

construction of municipal sewage treatment works.

### Construction Grants

The supplemental appropriation for the current fiscal year includes \$50 million for construction grants which are to be allotted on the basis of population and per capita income. Under the act, individual grants are limited to 30 percent of the estimated reasonable cost of the project or \$250,000, whichever is less. The act requires that at least 50 percent of the grant funds be used to assist in construction of treatment works serving communities of 125,000 or less.

A project must meet six basic requirements to be eligible for a Federal construction grant: (a) The project must be approved by the home State's water pollution control agency; (b) it must conform to a State water pollution control plan submitted pursuant to the act; (c) it must be included in a comprehensive water pollution control program of the Public Health Service; (d) the applicant must agree to pay the remaining construction costs; (e) the applicant must make provision for insuring proper and efficient operation and maintenance of the project after construction; and (f) the home State's water pollution control agency must certify that the project is entitled to priority over other eligible projects on the basis of financial as well as water pollution control needs.

### Application Procedures

Preliminary information on the operation of the new act continuing Federal-State cooperation in controlling water pollution has been released by Surgeon General Burney. Placed in charge of the initial operation of the program is Curtiss M. Everts, chief sanitary engineer of the Oregon State Board of Health.

Application forms and related materials will be available to municipal officials and others concerned from State and interstate water pollution control agencies, from the regional offices of the Department of Health, Education, and Welfare, and from the Public Health Service in Washington, D. C.

After completing the form, the applicant will submit it to his State water pollution control agency for approval and request notification on whether the project meets the requirements of the State water pollution control plan.

The Public Health Service will determine which projects satisfy the criteria for propriety of Federal aid and other requirements of the act.

More detailed procedural information will be available with the grant application forms.

Arrangements for the practical application of other provisions of the act are being prepared. The supplemental appropriation also included \$2 million for program grants to States and interstate water pollution control agencies and \$1 million for administration of the various provisions of the act.