THE ROLE OF THE SANATORIUM IN TUBERCULOSIS CONTROL[1]

by ALTON S. POPE, M.D.[2]

THE sanatorium movement in America arose not from any preconceived idea that it might contribute to the ultimate control of tuberculosis, but rather from the belief that it offered the first substantial promise of recovery to the stricken individual and at the same time provided urgently needed care for large numbers of tuberculosis patients. It is only necessary to recall that before 1880 recovery from frank tuberculosis was looked upon as little less than an act of Providence to understand the enthusiasm with which Trudeau's experience was received by the medical profession. Here at last was a method of treatment that promised to lift the age-long fatalism that had surrounded the diagnosis of phthisis.

In spite of Koch's clear exposition of the etiology and the mode of communication of tuberculosis the concept of the infectiousness of the disease spread very slowly. The long period of incubation and the absence of a rash or other obvious sign of the onset of illness long served to mask the demonstrated facts of transmission. Even had the risks of household infection been generally accepted it is doubtful whether the early proponents of sanatorium treatment would have been impressed with the value of the hospitalization of tuberculosis as a means of limiting the spread of infection. At just about that time the "Great Towns" of England had, at great cost, completed an extensive system of "Fever Hospitals" and the disappointment of finding that the hospitalization of 80 or 90 per cent of all reported cases of diphtheria and scarlet fever had no appreciable effect on the incidence of those diseases must have

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[2] Director of the Division of Tuberculosis, Massachusetts Department of Public Health.

served as an effective damper upon any hopes that the hospitalization of tuberculosis would be of any greater prophylactic value.

The universal emphasis upon altitude and dryness of the atmosphere as essentials in the treatment of tuberculosis at that time led to the establishment of all of the earlier sanatoria in comparatively remote mountainous areas, where inaccessibility proved a serious obstacle to their general use. This limitation was early recognized by V. Y. Bowditch, James Minot, and their associates in Boston, and the success of their pioneer efforts in the treatment of tuberculosis at sea level demonstrated the practicability of bringing the sanatorium to the patient instead of the patient to the sanatorium. The importance of this discovery to the development of the sanatorium movement is hard to over-estimate. A direct result was the establishment of the first state sanatorium in the country at Rutland, Massachusetts, in 1898. Of equal importance was the recognition of the fact that the care of the tuberculous patient is a public responsibility; for in the act establishing Rutland Sanatorium was a provision that if the patient is unable to pay the nominal charge of $4.00 per week his care becomes the legal responsibility of the town of settlement. Thus in a single act was laid the foundation for the present dominant role of the sanatorium in tuberculosis control.

It is not without significance that the reporting of tuberculosis as a disease dangerous to the public health and other organized attempts at control lagged behind hospitalization. The chronicity of the disease and the long period of infectivity rendered the usual measures of isolation and quarantine ineffective and the popular stigma attached to tuberculosis encouraged concealment of the diagnosis. Only when it had been demonstrated that the sanatorium offered actual hope of recovery was it possible to interest patients or doctors generally in the discovery or notification of the disease. The importance of early diagnosis in the effective treatment of tuberculosis is axiomatic but even the best organized case-finding

campaign soon loses its appeal unless diagnosis offers the prospect of effective treatment. Only where health administrators have recognized the interdependence of these two major factors has the full contribution of either to tuberculosis control been realized.

FUNCTIONS OF THE MODERN SANATORIUM

Though intended primarily for the segregation and medical treatment of patients with active tuberculosis the modern sanatorium has taken on increasingly important related functions in the tuberculosis program. Briefly these may be outlined as follows:

1. To provide adequate medical care for the sick patient and to insure him the greatest opportunity for recovery.
2. To limit the spread of infection by effective separation of the open case from his associates.
3. Through effective treatment to render the patient noninfectious.
4. To teach the patient how to live within the limitations imposed by tuberculosis.
5. To serve as a diagnostic center for the surrounding area.

Although Pratt demonstrated thirty years ago that it was possible under favorable conditions to carry out as effective treatment for tuberculosis in the home as was then given in the sanatorium he freely admitted that comparable results could be obtained only with cooperative patients under individual direction of an interested physician and close supervision of a trained public health nurse. Obviously such ideal conditions could be secured for a very small proportion of tuberculous individuals. With the general acceptance of collapse therapy and the prerequisite of radiographic facilities for the appraisal and control of treatment, comparison between home and sanatorium care is no longer pertinent. Few physicians are now willing to accept the responsibility for care of the active case under the limitations of home and office practice, nor are informed patients often willing to accept such care in areas where modern sanatoria are available.

From the standpoint of tuberculosis control, separation of the open case from his immediate associates is the most important single step. With intelligent patients under satisfactory living conditions it is possible to carry out reasonably satisfactory isolation of the patient in his home by means of strict medical asepsis. With uncooperative patients or any degree of crowding such precautions become futile. In Massachusetts among families in which a case of active tuberculosis has been found it is estimated that approximately one family in four harbors an additional case. Removal of the original case cannot prevent the infection which has already taken place but under average home conditions it is the only guarantee that such infection will not continue.

Any treatment which leads to the arrest of tuberculous disease at the same time renders the patient noninfectious. With early cases of tuberculosis such a result was not infrequent with the use of bed rest alone. In the majority of cases, however, healing was slow and in the presence of cavities the end result of treatment in those who survived was a crippled individual who for the rest of his life was a potential source of infection to his friends and relatives. From the public health standpoint the greatest contribution of collapse therapy has been its effectiveness in rendering open cases of tuberculosis noninfectious. It must be recognized that a considerable proportion of cases are still too advanced upon diagnosis for successful collapse and that in other instances effective collapse cannot be obtained on account of adhesions, but in spite of these drawbacks collapse therapy is doing more than any other one factor to improve the chances of recovery for the individual and at the same time to make it safe for him to return to his family.

Treatment has accomplished only part of its job unless it has taught the patient how to keep well; that is, how to live within the limits imposed by his disease. Some 20 to 25 per cent of all admissions to our sanatoria are re-admissions of patients who have been discharged in good condition but who came back with re-activation

of their tuberculosis. In certain instances the relapse is unquestionably due to work beyond the individual's strength or other factors beyond his control but in many cases it is due to his failure to heed the danger signals of tuberculosis and to adjust himself to his physical limitations. Many patients with arrested tuberculosis accomplish as much as normal individuals but almost always they do so by limitation of some of their activities. Just what this concession is most patients have to determine by experience, but one of the most valuable things which the sanatorium can give its patients is an understanding of their disease sufficient to make them realize what these limitations are and the necessity for observing them.

Most well-organized sanatoria through their medical staff give regular instruction to their inmates on the natural history of tuberculosis, the essentials of treatment, the prevention of infection, and the precautions necessary for continued health. When properly presented no subject is so absorbing to the convalescent patient, and by means of the radio it is as readily presented to the bedridden as to the ambulant patient. The effects of such instruction upon the re-admission rate cannot of course be measured in mathematical terms but the frequency of disregard of all precautions in relapsed cases is sufficient to convince the clinician that patient instruction is one of the most constructive activities of the sanatorium.

The relationship of the stage of tuberculosis upon discovery to prognosis has been too convincingly demonstrated to require more than passing mention at this time but it is something that must be kept constantly in mind in the elaboration of a control program. So long as over 85 per cent of patients are suffering from moderately to far advanced disease upon admission to sanatorium any improvement in treatment is seriously limited in its application. In fact this is probably the greatest single factor in maintaining the high case fatality rate in tuberculosis. That there has been no substantial increase in the proportion of minimal cases admitted to our sana-

toria is sufficiently illustrated by the experience of the Essex County Sanatorium, Massachusetts, where the percentage of minimal cases has remained constant for the past twenty years, while the proportion of far advanced cases has slightly increased.

If the sanatorium, then, is to make its full contribution to tuberculosis control the next essential is to bring the patient earlier to its doors. With the tuberculin test, the x-ray, and the diagnostic laboratory the necessary technical aids have been provided. The problem of their most effective application still remains, and the sanatorium may in part furnish the solution. After twenty-five years of unsatisfactory experience with municipal dispensaries staffed by local practitioners, the Massachusetts Department of Health in 1931 secured the passage of a statute authorizing state and county sanatoria to maintain out-patient departments and, upon request of cities and towns in the areas served, to operate periodic diagnostic clinics in such communities. These clinics are staffed by resident physicians from the sanatoria and wherever possible are held in the out-patient departments of local general hospitals, where x-ray facilities are available. Films are furnished by the sanatorium and nursing service and records are provided by the local board of health, thus maintaining local responsibility for the supervision of patients and their families. Patients are examined on request of physicians or local boards of health and reports are made only to such doctors or boards.

Under this system complete diagnostic service is made available to all indigent patients on the same basis as diagnostic laboratory service in other diseases dangerous to the public health. At present twenty-two such consultation clinics are in operation in the State and in 1936 the Middlesex County Sanatorium alone made 6,600 examinations for 4,145 patients. Approximately 90 per cent of the family contacts of all patients admitted to the Sanatorium have been examined, 8 per cent of whom proved to have pulmonary tuberculosis. Even more significant is the fact that 55 per cent of

these cases were in a minimal stage of the disease, compared with 10 to 12 per cent of the general admissions to the Sanatorium. The success of such a system depends, of course, upon a sufficient number of well equipped and adequately staffed sanatoria, reasonably accessible to the various parts of the state. Even more it depends upon a grade of medical service which commands the confidence of the medical profession and of the public. Under these conditions the sanatorium is, outside the large cities, the organization best situated for finding tuberculosis in a stage amenable to treatment.

THE RATIO BETWEEN BEDS AND DEATHS

The optimum ratio of sanatorium beds to annual deaths is among tuberculosis administrators only less controversial than the interpretation of certain x-ray films. The original ideal of one bed for each annual death, so long the standard of the National Tuberculosis Association, gave way some ten years ago to a goal of two beds per death, attainment of which was to lead to the early disappearance of tuberculosis. At present some half-dozen states have reached or passed that mark and are still wondering what the desideratum really is. The fact is we are coming to recognize that there is no optimum ratio between beds and deaths and that the demand for sanatorium beds is really a function of the general adequacy of the tuberculosis service in the area in question. The better the case-finding and the higher the grade of medical care provided, the greater will be the demand for sanatorium care and the more rapidly, we have reason to believe, will the incidence of tuberculosis in the community be reduced.

If the present trends of the morbidity and mortality continue and the present rate of sanatorium construction is maintained we must in the not-too-distant future reach a saturation point in several states. Some twelve years ago we estimated that about 35 per cent of all reported cases of tuberculosis in Massachusetts received sanatorium care. Two years ago this had risen to over 65 per cent, and

with 2.5 beds per annual death for the State as a whole we still have waiting lists at several sanatoria. Obviously, the time has come when the need for sanatorium beds must be measured, not by an arbitrary ratio, but rather by the adequacy of the tuberculosis program, which to a great extent determines the number of beds which can effectively be used.

ECONOMIC ASPECTS OF HOSPITALIZATION

In several sections of the country the sanatorium has been unable to fulfill its essential role in tuberculosis control on account of economic reasons. In some instances because the states or counties have been financially unable to provide the necessary plants and in others because insufficient provision has been made by the community for the hospitalization of indigent patients.

To consider the second obstacle first; it is obvious that if the sanatorium is to be fully effective it must be freely available to all population groups, regardless of their financial status. This means nothing less than the underwriting of all operating costs by the community, with the realization that individual patients can repay but a small part of the total. The precedent established at Rutland forty years ago has, to a great extent, guided American sanatorium practice since that time, and when we consider that only 15 to 20 per cent of the patients in Massachusetts sanatoria can pay the direct charge, which amounts to about one-third of the actual cost of treatment, it is evident that no less inclusive provision can reach those economic groups which are still the greatest reservoirs of tuberculosis.

Nor is it enough for the community to furnish sanatorium care to all tuberculous citizens unable to provide it for themselves. One of the principal reasons that patients leave the sanatorium before the completion of treatment is worry over family problems, especially inability to meet current living expenses. In connection with the sanatorium, trained social workers have proved of great value in

the adjustment of the patients' personal and family problems, but their services cannot be wholly effective in the absence of official recognition of community responsibility for the support of the dependent families of tuberculosis patients. In most parts of the country such relief is furnished by local departments of public welfare and in the more socially-minded states it is specified that receipt of such aid shall not pauperize the recipient. A frequent point of controversy is the allocation of responsibility for the care and treatment of indigent patients who choose to remain at home or who leave the sanatorium before the completion of treatment. In Massachusetts the obligation is shared by the local boards of public health and public welfare; the former providing all medical care and treatment for the patient, including special diets if necessary, and the latter furnishing regular maintenance to the patient and family.

LOCAL VS. CENTRAL CONTROL

The problem of how the community can most effectively and most economically provide sanatorium facilities is too complex to admit of any single solution. In most cases the answer is bound to be conditioned by existing forms of political organization as well as by economic and medical considerations. In Massachusetts for over twenty years all public sanatoria were built and operated by the State. Then, as the demands for the hospitalization of tuberculosis increased, the state authorities, apparently appalled by the magnitude of the problem, secured the passage of a law requiring all counties and cities of 50,000 population or over to build and operate their own sanatoria or to contract with existing sanatoria for the care of their patients. As a result some twenty-five additional sanatoria were built, at least half of them too small for economical operation or high-grade medical service. At the same time a state subsidy act was passed, providing payment of $5.00 per week to towns for each patient hospitalized in a sanatorium approved by

the State Department of Health. Intended primarily to encourage the construction of sanatoria and the hospitalization of open cases of tuberculosis, the subsidy act has been of considerable value in raising the standards of sanatorium construction and the medical treatment of the tuberculous. It also helps to maintain a local sense of responsibility for the control of tuberculosis, but from the standpoint of economy of construction and operation and quality of medical service there is no question today that the people of Massachusetts would be in a better position if they had continued the development of their sanatorium program under state management.

ADAPTING THE SANATORIUM TO LOCAL CONDITIONS

For the state which has recently started or is expanding its sanatorium program the same reasoning holds. A given grade of service can be provided more economically under unified control and the sanatoria can more easily be located where the need is greatest. A more difficult problem must be faced in states where the morbidity and mortality are relatively high and where neither the state nor county administrations can finance a sanatorium program. There the most promising solution seems to be the development of tuberculosis wards in local general hospitals, in association with one or more well-equipped central sanatoria. Many counties or small cities already have such general hospitals which operate with more or less empty beds a good part of the year and for that reason are faced with a perennial deficit. Wards for tuberculosis patients could be arranged at small cost and the existing x-ray plant would serve for diagnostic work on tuberculosis out-patients as well as for house patients. With a reasonable subsidy from the state to supplement the fees from the county or towns from which the tuberculosis patients come, the hospital would be assured of a steady income which should make it possible to employ a well-trained resident physician to serve both the tuberculous and the general hospital patients.

For such a set up to function effectively it is essential to have a central, up-to-date sanatorium which can receive patients for major thoracic surgery and act as a clearing house for the local hospital units. This sanatorium should also serve as a training school for resident physicians who will bring the essentials of the modern treatment of tuberculosis to the local hospitals and to the local physicians.

For the past three or four years such an arrangement has been working satisfactorily in two general hospitals in Maine and in the island of Jamaica a similar scheme, utilizing the parish hospitals, is being worked out by the Colonial Government and the International Health Board. One great advantage is the saving in initial investments for construction. Another which is less apparent but perhaps even more important is the enlistment of the interest and cooperation of the practicing physician in the treatment and prevention of tuberculosis. In the local hospital he can follow the progress of his patient and see the results of pneumothorax and other therapeutic procedures which make it seem worth while for him to try to do something about tuberculosis. At the same time easy access to the x-ray makes it possible for the doctor to recognize tuberculosis while it is curable and by routine examination of contacts to dry up some of the sources of infection. Such an organization should also provide one or more consultants from the central sanatorium to make periodic visits to the local hospitals to assist the staff in the selection of cases for thoracic surgery and to consult on other problems in diagnosis and treatment.