Tuberculosis Control in Institutions for the Mentally Ill

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The first state hospital in Minnesota was established in 1866 by the remodeling of an old hotel. From this beginning the system has grown until now there are seven hospitals for the care of the mentally ill, two for feeble-minded and one for epileptic individuals. These now have a combined capacity of about 15,000 caring for a state population of approximately 3,000,000.

In 1902 the first request was made for the construction of a separate unit for the care of state hospital tuberculous patients. This was financially provided for in 1904, and it was opened in 1906. Since that time isolation facilities have been provided at six institutions (later reduced to five), providing a total bed capacity of 604.

In 1942, Dr. H. A. Burns was appointed Head of a newly established Tuberculosis Control Unit for the state's mental and penal institutions. He inaugurated a program for obtaining a chest x-ray film of every patient and employee once each year. If any suspicious x-ray film changes were apparent, repeat x-ray films and a series of three gastric lavage specimens were routinely ordered. In some institutions it was possible on clinical grounds, such as in the investigation of unexplained weight loss, to adequately consider the possibility of tuberculosis in the differential diagnosis. Active tuberculous patients, when discovered, were transferred to one of the tuberculosis isolation centers where the treatment consisted essentially of bed rest. There were several reasons for this, among them being the small number of tuberculous patients in each center, together with the latter's wide geographic separation, which militated against the employment of a clinically qualified staff to care for the tuberculous. Instead, this work was commonly assigned, as an extra chore, to a physician interested primarily in psychiatry. In spite of the obvious limitations of this program, there was some evidence that a measure of epidemiological control was being achieved.

In 1934 and again in 1944, Dr. Burns personally administered and read tuberculin tests on all of the more than 10,000 mentally ill patients. These showed in the first instance, 90.9 per cent positive reactors as compared to 73 per cent 10 years later.

For a number of years Dr. Burns advocated that one tubercu-
loss treatment center with an adequate staffing pattern be provided, which would care for all Minnesota State Hospital patients developing tuberculosis. The 1947 Legislature provided funds for this purpose but they proved insufficient. This appropriation, however, did permit plans being drawn for the remodeling, as a tuberculosis treatment center, of an existing building at the Anoka State Hospital, chosen because of its proximity to the medical centers of Minneapolis and St. Paul. The 1949 Legislature provided the additional funds needed, and work on the remodeling of this building commenced May 16, 1949. Very tragically, particularly for those of us who knew him personally, Dr. Burns' illness necessitated his taking a leave of absence a few days after the contractor actually started remodeling the building in accordance with plans to which Dr. Burns had significantly contributed of his knowledge and experience. He died July 8, 1949. His successor, Dr. A. E. Krieser, has continued the same general program for the control of tuberculosis and is, in addition, in the process of expanding the scope of his department's activities to include the epidemiological control of all communicable diseases in the mental and penal institutions of the state.

The building that is being remodeled previously housed in excess of 400 male patients. It consists of a three-story center section with two two-story wings. In the opinion of the author, and others who have studied the plans, the architect, Mr. E. D. Corwin, of St. Paul, Minnesota, did a truly remarkable piece of work in incorporating into his remodeling plans all of the services and facilities he was asked to provide. His ability to do so becomes all the more noteworthy in view of the fact that he was confronted with the limitations of an existing building originally designed for an entirely different function. His plan will provide an essentially self-contained unit with the exception of service from a central heating plant, laundry, and kitchen.

The three-story center section of the remodeled building will have on the first floor, besides the usual facilities, a visitors waiting room and adjacent room which includes lockers where visitors may store their bulky outer clothing, purses, et cetera, and properly gown and mask before entering the contaminated area; an office for the physician who will be in charge of the state-wide tuberculosis control program; a dental suite; a canteen for patient use; a beauty parlor; a barber shop; space for occupational therapy, and a common dining room for men and women patients, large enough to seat one-half of the 250 patients in the building.

On the second floor there are offices for three physicians doing the clinical tuberculosis work, a staff conference room, an x-ray room housing a 200 milliampere, general purpose x-ray unit with
spot film attachment and electronic controls, with the necessary adjuncts.

On the third floor there are dressing and locker rooms for nurses and physicians in connection with the operating suite and an operating room having a sub-sterilizing alcove and being connected by a pass window to the central sterilizing facility for the entire building. There is also space for the storage of a portable x-ray machine, that can be used anywhere in the building and more specifically in the operating room in connection with orthopedic surgery. There is also a two-room suite having a vertical fluoroscopic unit in one room and space in the other for administering pneumothorax. The balance of that floor is taken up by storage space and a medical laboratory.

The two two-story wings are identical and each of the four wards contained therein provides a nourishment kitchen, toilet, shower and bathroom facilities, clean and soiled utility room, linen rooms, and day room space. A majority of the beds are in large rooms formerly used as dormitories, now arranged in cubicles having three foot high partitions. The partitions will serve two purposes: (1) insure the patient a modicum of privacy, and (2) prevent overcrowding. Common experience in a state hospital setting is that, as the need arises, beds are pushed progressively closer together until finally it is difficult to walk between them. A duplex electrical outlet is being provided for each bed, and it is envisioned that one will be used for a light on a bedside table, while the other may be used for an individual radio equipped with earphones rather than a loud speaker.

On the two upper floors a single room is provided at the end of the ward, toward the center of the building, in which a moribund patient may be placed. Adjacent to this, situated in the “clean,” off-the-ward area, there is another room for the use of relatives of such a terminal case. Incorporated in the partition between these two rooms, there are a large window and a door. Relatives may visually observe a dying patient while still remaining in a “clean” area. However, if they wish to put on a cap, gown, and mask, the door affords ready access to the patient’s room.

To provide for the care of patients who have some contagious disease, in addition to their tuberculosis, a sub-isolation unit has been provided on two wards. Each unit consists of two single rooms communicating with an intermediate area having separate toilet, shower, lavatory, utility, and sterilizing facilities.

Located at strategic intervals throughout the four wards and in other areas of the building are recessed scrub-up sinks with adjacent lockers for both clean and soiled caps, gowns, and masks.

A conveniently located ambulance entrance and ramp afford
access to both the elevator and the morgue. The latter is located in the basement and provides shower, toilet, and lavatory facilities. There are also provided in this basement area a large serving kitchen with adjacent mechanical dishwashing room, an office for a dietitian, and other facilities to be described in more detail.

The problem of handling laundry from a tuberculosis unit in a central laundry serving other types of patients has been approached in the following manner. There is, on each of the four wards, an automatic washing machine for the preliminary removal of stains from soiled linen. All laundry is then dropped down a chute, which has an opening on each floor, to a collecting room in the basement. Here it is sorted and placed in a bulk sterilizer. Following the sterilizing process it is removed from the other end in a clean area and taken to the central laundry. The sorting room is equipped with ultraviolet lamps in an attempt to protect employees from air-borne infection.

In an effort to control the passage of insects from the tuberculosis building to other areas of the hospital, vit the tunnel system, a pipe line having appropriate fittings at suitable intervals has been installed. This will introduce, by momentarily opening a valve, a fog of any chosen liquid insecticide under 40 pounds of steam pressure throughout 75 feet of the connecting tunnel.

Two facilities have been provided and will function in a manner for which we were aware of no precedent. For each sex of employees, a series of three rooms are arranged so that employees going off duty will enter room Number 1, remove their work clothing and hang them in lockers where it will be exposed to ultraviolet rays for the ensuing 16 hours. They will then enter room Number 2, having shower, toilet, and lavatory facilities. They will next go to room Number 3, where they will secure their street clothing from lockers, dress, and go directly out of the building through a separate entrance servicing only this locker section. Upon going to work on their next shift, the process is reversed with the shower being omitted.

Another facility, which insofar as we know is original, is a room insulated with cork and lined with stainless steel on floor, ceiling, and walls. It is our plan to pass electrically heated food carts and tray carts, which have been on the wards and in the patients' dining hall, through this room. After having been sterilized by live steam they will be removed via a second door into the "clean" area of the serving kitchen. It is our intention to rewire these carts using glass beads on the electrical circuits in lieu of rubber and fabric insulation.

This building should, we believe, prove functionally adequate and will, we predict, significantly contribute to our over-all pro-
gram for the control of what is said to be today's most pressing tuberculosis problem, tuberculosis control in institutions for the mentally ill.

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Discussion

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Dr. Miller's last statement pertaining to the tuberculosis problem in institutions for the mentally ill is especially significant. Apparently this has been a most pressing problem since such institutions were first established. During the 19th century it was pointed out that more than one-third of the deaths among inmates from all causes were due to tuberculosis. Theorists speculated that mental illness predisposed to tuberculosis. They said there was something inherent in the body of the insane person which constituted an ideal soil for the development of this disease. In 1897, H. M. Bracken, Secretary and Executive Officer of the Minnesota State Board of Health, read a paper before the Conference of the State Boards of Health at Nashville, Tennessee, titled "Should the Tuberculous Insane be Isolated from Other Inmates in Our Asylums and Accomodations Provided for Them in Separate and Detached Buildings?" This was a classic in that it pointed out that the only reason for so much tuberculosis among the inmates of these institutions was contagion. Dr. Bracken emphasized the importance of finding cases of tuberculosis then in the institution and detecting others on admission and isolating them in separate buildings so they could not spread their tubercle bacilli to the other inmates. The program he laid down would be suitable for any institution today. Dr. Bracken's paper and his subsequent insistence stimulated enough interest that on two of the state hospital grounds small buildings were later in operation for isolation of tuberculous patients.

Apparently Emil Bogen now of California and H. A. Burns of Minnesota were the first, in this country, to conduct good tuberculosis surveys in institutions for the mentally ill (1934). Bogen found in a large state hospital of more than 2,000 patients the incidence of tuberculin reactors increased among the inmates according to the length of institutionalization. His study indicated that many of the inmates contracted the infection as well as illness after admission to the hospital. He ascribed this to contagion and said, "The doctrine of 'constitutional types' underlying predisposition to mental disease and to tuberculosis is not
supported by the data here presented." The same year Burns initiated a study of tuberculosis among inmates as well as personnel in state hospitals, asylums, schools for the feeble-minded and epileptics in Minnesota. Among 82 per cent of the 11,517 inmates who reacted to tuberculin, 11.2 per cent presented demonstrable pulmonary lesions. Among the 2,430 employees of these institutions, 72 per cent reacted to tuberculin, of whom 5.2 per cent had demonstrable pulmonary lesions.

These early surveys were most revealing. It was no longer a matter of estimating the incidence of primary and reinfection type of tuberculosis in institutions for the mentally ill, since actual incidences had been established by most modern diagnostic procedures. Soon surveys were conducted in various places on the Western Hemisphere including New York, California and Argentina, and serious tuberculosis problems were found nearly everywhere.

Some years ago Dr. Ray Lyman Wilbur, President of Leland Stanford University, called attention to the lag between establishment of facts and their practical application. Here is a clean-cut example in Minnesota. After Bracken emphasized the seriousness of the problem in 1897 and Burns re-emphasized it by actual survey in 1934, it was not until 1942 that a tuberculosis control unit of the State Division of Institutions was established, and not until 1950 that a satisfactory building is to be opened for adequate isolation and treatment of the tuberculous mentally ill. Thus 53 years elapsed between the publication of Dr. Bracken's paper and the opening of this hospital.

When Dr. H. A. Burns was appointed chief of the newly created tuberculosis control unit in 1942, he improvised every possible method of controlling the disease with the limited available facilities. The isolation centers which Dr. Miller has described proved effective. For example, the tuberculosis mortality rate among the mentally ill was approximately 1300 per 100,000 in 1939. There was a decrease to approximately 700 in 1948.

With the facilities Dr. Miller has described, which closely approach the ideal, one may expect a continuous decrease in the mortality rate. The continuation of admission examinations of all patients to state institutions and immediate transfer of all contagious cases to this special tuberculosis unit, as well as periodic examinations of all inmates with immediate transfer of those in whom the disease evolves to demonstrable proportion, should reduce the infections and reinfections occurring among the inmates of the state institutions to almost zero. Unfortunately, the present patient body of these institutions probably constitutes the highest tubercularized group in the state. Among any group of
adult tuberculin reactors, despite the clearness of x-ray films and total absence of evidence of clinical disease at the moment, there is certain to be a constant crop of clinical tuberculosis evolving among them. The only possible hope of preventing such a situation would be through the discovery of a drug capable of destroying tubercle bacilli in the bodies of these tuberculin reactors. As yet no such drug is available, therefore the only solution of the problem is the one now in effect, which consists of keeping the tuberculin reactors under close surveillance and as clinical lesions evolve, isolate and treat.

It was particularly pleasing to me that Dr. Miller devoted so much time to the description of his building for the isolation and treatment of the tuberculous mentally ill. It is his intention that the patients of his institution receive care, including most modern drugs, collapse therapy, pulmonary resections and everything else that is included in a most modern sanatorium for the tuberculous. He is organizing an excellent medical, nursing and social service workers staff.

Most all states have a serious tuberculosis problem in their institutions for the mentally ill. Each one should have one or more buildings, depending upon population, where these patients can be isolated and receive the best of treatment even though some patients are hopelessly ill mentally. Every effort should be made to convert the sputum so as to protect fellow-patients and personnel against contagion. Dr. Miller and Dr. A. E. Krieser, now Chief of the Tuberculous Control Unit and their co-workers have devoted a tremendous amount of time to providing the best possible facilities for the solution of the problem of tuberculosis among the mentally ill. They deserve high praise and I am sure their efforts will be rewarded by success.

For several years Dr. Otto L. Bettag, Chicago, has been Chairman of the Committee on Chest Diseases in Prisons and Institutions for the Mentally Ill of the American College of Chest Physicians. This committee has done a large volume of excellent work by way of collecting important data, setting up standards, etc., etc. This vast store of information is available to anyone who desires to initiate or improve a tuberculosis control program in such institutions.