Tuberculosis Control in Connecticut

These nine briefs, taken from discussions on June 18, 1952, at the tuberculosis session of the eighteenth New England Health Institute, Storrs, Conn., give an interrelated picture of a State tuberculosis program.

The Organization

PHR brief

The Connecticut State Tuberculosis Commission in Hartford is the official State organization for tuberculosis control. It was first organized in 1909 for the purpose of providing and managing State tuberculosis sanatoriums. Its present case-finding program of mass radiography, consultation services, education, and rehabilitation was set up in 1939. The five commission members serve without salary for 6 years. The director acts as administrative agent and coordinator. The commission meets for an all-day session approximately once every 10 days.

The tuberculosis commission is in an unusual position to develop a coordinated program with continuity in policy. In Connecticut's 169 distinct communities, tuberculosis control activities are conducted with the cooperation of each local health officer, who is kept fully informed of all State level activities in his community. Almost any community can be reached from Hartford in a matter of 3 hours or less. Connecticut, an essentially industrial State with a population of 2 million, is divided into four sanatorium districts with a State sanatorium for adults in each area.

The 1951 provisional death rate in Connecticut for tuberculosis was 14.1, or less than half of the 1940 rate. It has been estimated, however, that there are now approximately 9,000 unknown cases of tuberculosis in Connecticut, of which about one-third are active cases.

By Paul S. Phelps, M.D., director, Connecticut State Tuberculosis Commission.

Interrelationship

New cases of tuberculosis are reportable, as are deaths, to the Connecticut State Department of Health. They are referred to the commission for incorporation into the State case register, which is supervised by a research statistician. The commission has cooperative working relationships with the rehabilitation division of the State board of education, the Commission on Chronic Alcoholism, and the Connecticut Tuberculosis Association and its affiliated organizations, as well as many other agencies. Several local health departments have their own well-organized control programs with which the State cooperates to the fullest extent. An excellent State laboratory for sputum and body fluid examinations is maintained by the State health department.

Of the 128 visiting nurse associations in Connecticut, 104 are independent organizations. The commission has assigned one of its four public health nursing consultants to each sanatorium district. They use the State case register and work with clinic and survey physicians, sanatorium staffs and patients, and local public health nurses. The coordinator of nursing education in the State Tuberculosis Commission has set up a program of student nurse affiliation with the teaching hospitals of the State.

Sanatorium Capacity

Connecticut has a potential total sanatorium capacity of 1,715 beds (1,570 beds in State sanatoriums), a ratio of 5.9 beds per death. There are about 175—all men—on the waiting list for sanatorium admission. The ratio of men to women applicants is about 2 to 1. Some of the sanatorium beds are now closed because of lack of personnel and because of insufficient housing for personnel or because renovations are needed. It is expected that most of these conditions will be eliminated in the near future. Funds have already been provided for additional housing, and renovations are already under way. A recent reclassification of State employees may well provide for the lack of personnel, particularly among nurses.

There is still a means test in Connecticut with a minimum charge required by law of $4 a week although patients are expected to pay as much of the $70 weekly cost of care as they can afford. Strenuous efforts are being made to eliminate the means test. The town or State must assume financial responsibility for those patients without funds.

In 1951, approximately 201,779 apparently well adults were X-rayed throughout the State; 1,300 patients were admitted to State sanatoriums; 15,246 nursing visits were made by local public health nurses; and 23,814 visits were made to the various consultation services.

The Mass X-ray Survey

PHR brief

The primary purpose of mass radiography is to discover new cases of pulmonary tuberculosis. Its side products are important, too. Most valuable among these is the discovery of nontuberculous chest disease such as abscess and bronchiectasis, chest tumors, and heart disease associated with changes in the size or shape of the heart shadow.

By Alan L. Hart, M.D., M.P.H., senior tuberculosis control physician, Connecticut State Tuberculosis Commission.

Beginning in 1944, the State Tuberculosis Commission has conducted mass X-ray surveys systematically and on a voluntary basis in communities, in industries, and in institutions. Approximately 80,000 people are X-rayed each year.

Survey Procedure

When a survey is planned, a site is selected for the X-ray unit, and the electrical current there is checked. Two technicians operate a unit at the rate of 50 people an hour throughout a working day. All screening examinations consist of 4″ x 5″ stereoscopic films.

Seventy-millimeter films were abandoned some years ago in Connecticut. We found, on reviewing 25,000 survey films selected at random, that the percentage of significant chest lesions missed on 70-mm. films was four times the percentage missed on stereoscopic 4″ x 5″ films.

Film Reports

Films are brought from a mobile survey unit to a central darkroom for careful and uniform processing to give films of good quality and density. All survey films are read by physicians with extensive experience and training in interpreting chest films and in the clinical diagnosis and treatment of tuberculosis. Every film with any significant deviation from normal is set aside for more careful study. During this study, the master files and the State register of known tuberculosis cases are searched for information about anyone whose film suggests possible chest disease. Whenever such information is found, it is incorporated in the report of the current survey film. If previous films are found, interpretations of these are also included in an effort to make the report more useful.

The physician named at time of survey by the person X-rayed receives a report on every positive film. The report indicates possible heart disease and nontuberculous chest disease as well as suspected pulmonary tuberculosis. The report form includes a chest diagram on

which the locations of lesions can be marked. Space for noting further study suggestions is also provided.

Survey Findings

In 1944, the percentage of tuberculosis picked up was approximately 1.5, rising to 1.67 by 1946. It is now about 0.5. At first, the increasing volume of survey work was sufficient to offset the percentage decline, and the number of cases discovered each year continued to rise until 1950, but there has since been a fall in the total number of cases discovered.

From carefully controlled studies of surveys in selected industries and selected stable communities, we know that the percentage of new cases falls off very rapidly when surveys are repeated. From this, we conclude that 4 to 5 years should elapse between surveys in the same place, unless the turnover of employees or increase in population has been great. It now seems unnecessary for purposes of tuberculosis control to make annual surveys in the same population groups.

Another observation is that our surveys pick up most tuberculosis in middle-aged and elderly adults—in the forties and fifties among women, and in the fifties and sixties among men.

Approximately 72 percent of the cases of pulmonary tuberculosis picked up in mass surveys are minimal; less than 20 percent are moderately advanced; and less than 5 percent are far advanced. In a minimal case, the patient seldom has any symptoms of which he is aware, and he is naturally reluctant to believe his condition warrants medical treatment or hospitalization. Also, many physicians are reluctant to believe that people can have pulmonary tuberculosis when they show no clinical symptoms and there is nothing to direct attention to their lungs except a shadow on a chest film. The tendency is to reassure the patient that the lesions are old and inactive, but the tragedy comes later when the same patient is found to have moderately or far advanced disease.

The precise value of mass radiography in tuberculosis control will be determined by future events. With good follow-up and clinical evaluation, it can help to build a more effective control program.

Consultation Services

The field consultation services of the State Tuberculosis Commission were established to augment the existing clinical facilities available at the out-patient departments of the sanatoriums and at locally operated city clinics.

Presently, there are in Connecticut 13 field consultation services, 5 sanatorium out-patient departments operating directly under the tuberculosis commission, and 5 city clinics and 1 sanatorium out-patient department cooperating with it.

Plans and details of operation are discussed in advance with the local health authorities and physicians. Space for a waiting room, nurses' room, dressing room, X-ray room, and examining room is made available in the local health department, in the hospital, visiting nurses' quarters, or elsewhere. Equipment is furnished by the State, and the permanent equipment is installed and tested prior to the first session at the field clinic. All film processing is done at the central office of the commission in Hartford.

Consultation Schedule

After estimating the number of clinical sessions per month, the tuberculosis commission notifies every physician and nursing agency in the area. A schedule of proposed clinic sessions showing date, time, and place, and a supply of "request for examination" forms are enclosed with each letter. No charges are made for services, which are limited to the diagnosis and follow-up of the known case of tuberculosis, the suspect of chest pathology, and the contact. Patients are accepted by physician referral only and are seen on an appointment basis. Examination results are reported to the family physician, and the patient is instructed to consult with him.

As "request for examination" forms are re-

By R. C. Edson, M.D., chief, tuberculosis control, Connecticut State Tuberculosis Commission.

ceived in Hartford, existing available records are pulled, and the State tuberculosis control physician makes up his clinic. To utilize his time most efficiently and serve as many patients as practicable, efforts are made to predetermine which patients need a detailed examination by the physician.

Information from the request form or from existing records helps to identify the known case and the suspect. Interviews are scheduled at half-hour intervals. The contact and the possible source of infection are not normally seen by the physician and are scheduled at the rate of three interviews every 15 minutes.

Appointment notices are then mailed in duplicate—one to the patient, and one to the local nursing organization—2 weeks ahead of the clinic session. These methods permit control of the clinic load and review of records and keep the patient's waiting period at a minimum.

The Clinic Session

On the day of the clinic, the State team—tuberculosis control physician, clinic nurse, and X-ray technician—leave Hartford. Records, forms, X-ray films, and supplies are their responsibility. They are joined at the clinic by the local public health nurse. Records and equipment are brought in. The nurses may interview the first patients as the X-ray equipment is set up. Each patient is interviewed by a nurse, who enters identifying data on a 5″ x 8″ record card. If the patient is to be seen by the physician, a history and laboratory sheet is started, and the patient's temperature, pulse, respiration, and weight are recorded. The patient is X-rayed, then seen by the physician; and history, examination, and laboratory studies are made as indicated. The patient is instructed to contact his family physician within the next week.

When the physician does not see the patient, the nurse obtains sufficient information to ascertain whether the patient is a contact, and, if so, she records pertinent exposure factors. The patient is then X-rayed and may be tuberculin-tested; his record is briefly reviewed by the physician, and after instruction about seeing his physician the next week, he may return home.

Postclinic Procedures

At the end of the clinic session, a brief conference is held between the State and local clinic personnel. By quickly reviewing each record and noting omissions or corrections, an opportunity is given to discuss common problems and to iron out the minor wrinkles in procedures. The team then returns to Hartford.

After processing the films and collecting the required records, a detailed report is sent to the referring physician. If tuberculosis has been found or is suspected, a summary of the findings is sent to the local health officer and the public health nurse in the community where the individual lives. Where follow-up is indicated, a procedure is followed similar to that of the initial visit, a return date is specified, and the 5″ x 8″ record card is placed in a tickler file. Individuals are classified as known cases, suspects, possible sources, contacts, or clinical survey cases, and are listed on a day sheet under their classification. Sufficient statistical data is recorded and summarized on a monthly and yearly basis to evaluate achievements. Copies of similar records are supplied by the local city clinics and the sanatorium out-patient departments so that an over-all evaluation of clinical facilities is available in Connecticut.

In the fiscal year, July 1, 1950, to June 30, 1951, 23,110 visits were made by 15,650 patients; 436 new cases of tuberculosis were diagnosed, of which 180 were considered active; and there were 366 active cases among the known 2,986 cases being followed.

The Diagnostic Laboratory

In time consumed and in cost of materials, an adequate test for tuberculosis ranks as one of the most expensive examinations in a public health laboratory. The cost is small compared to the value of the findings to the person with

By Friend Lee Mickle, Sc.D., director, bureau of laboratories, Connecticut State Department of Health.

symptoms of tuberculosis, to his family, and to the physician who must decide whether he should remain at home or receive sanatorium care. The cost to the State is small when we consider that otherwise undiagnosed cases are found by laboratory tests, thereby removing the infectious person from general contact with persons who might become infected, and thus preventing an unknown number of possible new cases as well as the further damage that could result to the person himself.

40 Years of Tests

The examination of sputum for tuberculosis was one of the three or four tests for detecting communicable diseases which were undertaken when the bureau of laboratories was first established in 1905 on the campus of Wesleyan University in Middletown. At that time, the only test made was a stained smear on untreated sputum which was examined microscopically. Laboratory techniques were improved over the next 40 years, and today's findings are infinitely more reliable. Inoculations of animals with materials suspected of containing tubercle bacilli were started in 1925, but these tests were few. Routine culturing of sputum for tubercle bacilli was begun in 1941.

Laboratory examinations for tuberculosis rose undramatically from small beginnings in 1905 to almost 2,500 in 1942, but reached a surprising high of 14,000 in 1951. Of all laboratory examinations made for the diagnosis of all communicable diseases, those for tuberculosis rose from 3.6 percent in 1942 to 12.7 percent in 1951. By 1951, the number of tuberculosis examinations had increased 500 percent over those given in 1942, even though the number of all yearly examinations now given in the bureau still approximates the 1942 figure.

Laboratory Tests

Currently, laboratory tests on materials from tuberculosis suspects comprise:

1. Microscopic examinations of sputum which has been treated to concentrate the causative agent in the portion to be examined.
2. Cultures of sputum and other body fluids to grow the living bacillus *Mycobacterium tuberculosis.*
3. Animal inoculation tests on body fluids, and on sputum on request, and occasional animal inoculations to test the virulence of nontypical cultures.

The specimens are concentrated with sodium hydroxide 4-percent aqueous solution, shaken in a Babcock shaker, and centrifuged in an angle centrifuge. The smears are stained with Ziehl-Neelsen acid-fast stain and are examined and reported promptly after arrival at the laboratory. The concentrates are cultured at the time of making the smears. Most positive cultures appear after approximately 3 weeks and are reported as soon as they are identified. Microscopic confirmation is made for each culture. Those showing no growth of tubercle bacilli are held for 3 months before they are reported.

Animal inoculations are made on the specimens as received, and the animals are sacrificed after 8 weeks. A few isolated specimens are treated before inoculation. Practicing physicians, physicians in hospitals, at tuberculosis clinics, at mental institutions, and in laboratories throughout the State send specimens. Occasionally, animal inoculation tests for virulence are requested by laboratories on cultures which they have isolated.

The following table shows how the examinations for tuberculosis were divided in 1951. About 5 percent more positives were found on culturing than by microscopic examination of the sputum concentrates.

	Total	*Number positive*	*Percent positive*
Microscopic examination for sputum concentrates	5, 028	460	9. 1
Cultures on sputum concentrates	4, 939	692	14. 0
Direct animal inoculations	1, 518	144	9. 5
Cultures on specimens for direct animal inoculations	1, 528	150	9. 8
Pathogenicity tests	235	198	84. 3

The culturing of specimens establishes the identity of any acid-fast organisms. There are instances where acid-fast organisms are observed in stained smears of the original specimen but after growth on culture media, the colonial characteristics show they are not tubercle bacilli. It is a serious error when these other acid-fast organisms are reported to the physician in such a way that he is led to accept them as tubercle bacilli. There may always be doubt in the physician's mind even though follow-up X-rays do not show evidence of tuberculosis. Occasionally in our experience cultures have grown which closely resemble cultures of

tubercle bacilli but which are not typical. Sometimes the difference is slight. Animal inoculations are always done on these organisms to establish without question the virulence or nonvirulence of the culture isolated.

Tuberculosis Control

The eradication of tuberculosis can be accomplished only with a community program which coordinates modern case-finding methods, public education, improved nutrition and housing measures, chest X-rays, laboratory tests, better surgery and treatment methods, and rehabilitation programs. It will take many more years of continuous effort to reduce the incidence of tuberculosis, and it is evident that the continued availability of laboratory services as in Connecticut is essential to provide the foundation for future as well as present control programs.

Poor laboratory facilities must be improved, and good laboratory services must be extended.

The Case Register

PHR brief

A tuberculosis case register is a current system of records for keeping a summary of pertinent medical and public health data for every known tuberculosis patient within a given area. It summarizes and records information supplied by physicians, nurses, clinics, hospitals, sanatoriums, laboratories, or other tuberculosis control agencies.

Usually, physicians, hospitals, and clinics include in their records only patients under current treatment, and the patient's follow-up is his own responsibility.

It is the currency, accuracy, and completeness of the data recorded which distinguishes a case register from other record systems. Both State and local registers function as:

By R. MacNish, M.P.H., research statistician, Connecticut State Tuberculosis Commission.

An index of all known tuberculosis patients within the register area.

A source of information for:

Reference, follow-up, and supervision of individual patients and their contacts.

Planning and evaluating a control program.

Research.

State and Local Registers

The State register provides a clearinghouse of information and the nucleus of a working register to be reproduced in any local area upon request. It serves as a guide in the consultation of State and local personnel and as an administrative tool for program planning, supervision, and evaluation. The local registers are tools for individual case management. There is a continual exchange of information between the State and local registers.

In the central office of the State Tuberculosis Commission is the State register with a card for every known tuberculosis patient in Connecticut. Local health officers supervise local registers containing the same type of information as well as more detail about patients and contacts under local supervision.

All registers use a visible filing system with folded 5″ x 8″ cards showing on two visible margins the register number, name, town and district of residence, birth date, sex, color, and marital status. The body of the card contains additional personal history, information from initial report, hospitalization for tuberculosis, progress notes, a place for names and examinations of contacts, and death data. Cards are filed alphabetically in the State register for each town in the four sanatorium districts of Connecticut. Colored celluloid tips and sliding signals facilitate quick summaries.

Active and Inactive Records

A register combines a current visible file for all administratively active cases and a closed file for all administratively inactive cases. The current file contains cards for all diagnosed cases of tuberculosis: active; activity undetermined; or inactive if examined once a year or less. It also includes all applications for admission to a State sanatorium. The closed file includes cases with inactive pulmonary disease if examinations are less frequent than once a year; deaths, diagnoses changed to nontuber-

culosis; cases moved out of State or unable to be located; and all cases with no status report for over 5 years. There are also an alphabetical, visible master index file with a small identifying card for each register case giving its file location and a punch card system for machine tabulation of data. Interchange of information forms patterned after the register card are used for forwarding reports from register to register.

A satisfactory register is possible only through the cooperative efforts of all concerned with the problems of tuberculosis control.

The Nurse Consultant

PHR brief

In 85 of 169 Connecticut towns, the public health nursing organizations provide public health nursing service. There are only five boards of health with full-time health officers who employ public health nurses for the tuberculosis nursing service. In 43 towns without a local public health nurse, the State Tuberculosis Commission provides direct tuberculosis nursing service on request until local service can be established. Because of the different organizations offering tuberculosis nursing service, we have carefully planned an information referral system to provide continuous and integrated service to the tuberculosis patients.

Each one of the four public health nursing consultants of the commission is assigned to a sanatorium district for liaison between public health nurses, the sanatorium, the consultation service, and the State Tuberculosis Commission.

A Dual Role

The duties of a nurse consultant in Connecticut's tuberculosis control program are somewhat unusual. To the local public health nurses, she interprets the control program.

By Helen M. Green, R.N., senior tuberculosis control nursing consultant, Connecticut State Tuberculosis Commission.

She also participates in the student nurse program, in the follow-up of cases found through mass X-ray surveys, and in monthly conferences of State-employed public health nurses. It is her dual role with the sanatorium and the local community which makes her a valuable link in the control program. This can best be illustrated by a brief story of her work with a new supervisor in a local two-nurse agency and a typical tuberculosis patient, Mr. X.

The nurse consultant discusses plans for acquainting the new supervisor with the services and facilities in the State. During the period when the new nurse is gaining familiarity with her area and the health program, the consultant reviews statistical data on tuberculosis for the local community over the preceding 3 years (mortality, newly reported cases, and sanatorium admissions), and field reports, correspondence, and the State case register.

On her first visit to the new supervisor, she explains the functions of the tuberculosis commission and the types of referrals which will be sent to the local nurse, and she describes the consultation service. She suggests sample information literature which the Connecticut Tuberculosis Association makes available. Before her next visit, she reviews the case register in more detail to obtain information on patients recommended for sanatorium care, on patients awaiting admission, on ones who have refused sanatorium care, and on those who left the sanatorium against advice. On the second visit, both nurses will discuss specific cases and determine the nursing needs of each patient. The consultant arranges for the local nurse to observe a field consultation service which she also attends to explain the individual cases.

The Case of Mr. X

A week later, the local supervisor receives a report on a Mr. X who was examined at the consultation service. She calls his physician, who explains that he has received positive sputum reports on Mr. X and that sanatorium care is advised. The physician has talked to Mr. X and has completed the sanatorium application, but he requests the nurse to give the patient's family instructions about preventing further exposure. He has arranged for examination of the household contacts at the con-

sultation service. Knowing the importance of visiting as soon as possible after a diagnosis, the nurse calls at the home of Mr. X that same day.

During her visit, the nurse discusses the problems that are foremost to Mr. X and his family: how long he may be sick; are the children infected; where are the tuberculosis hospitals located; how is tuberculosis treated? She teaches Mr. X how to guard against spreading his infection. She explains the services offered by the community's medical and social agencies.

The nurse regularly visits Mr. X and his family to continue her teaching and to initiate a regime comparable to sanatorium routine. Any problems or questions she cannot answer, she communicates to the public health nursing consultant in the tuberculosis commission. Meanwhile, she completes a supplement to the sanatorium application for admission, mailing it to the commission, which will send a copy to the sanatorium with a copy of the application when the patient is assigned a vacancy.

When the patient's name nears the top of the waiting list, the consultant communicates with the local public health nurse to assure that Mr. X is planning to accept the sanatorium vacancy. The vacancy assignment is sent to the local nurse, who ascertains from Mr. X that all necessary preparations have been completed for his hospitalization. She also explains the procedure for cleaning his room after his departure from home. During his hospitalization, the local nurse visits his family and talks with the school nurse about his children and with the industrial nurse at the plant where he works.

At the Sanatorium

After Mr. X has been admitted, the nurse consultant attends the sanatorium staff conference when his case is presented, his films are reviewed, and plans for his treatment are discussed. She learns he is anxious about the health of his youngest child and notifies the local nurse, who visits his family and arranges for the child's examination. When Mr. X is scheduled for rehabilitation conference, the consultant inquires about his future plans. After the conference, she reports the rehabilitation plans for him to the local nurse. When she next sees him—about 2 months before his discharge—she discusses plans for his medical supervision after he leaves and emphasizes to him the importance of following the physician's recommendations upon discharge.

The local nurse is notified of the pending discharge with a request for the status of present home conditions. She helps prepare for Mr. X's homecoming by explaining his limitations and by pointing out the value of keeping him on a regular routine. The information about his present home conditions is presented at the sanatorium staff conference, if indicated, and is then attached to Mr. X's record for use at the final discharge interview. The local nurse visits Mr. X after discharge to assist in his readjustment to living outside the hospital community. Many patients need greater help here than was needed upon admission to the sanatorium.

Through this plan of referral, we have eliminated many of the gaps between the sanatorium and the home, and better continuity of patient care is provided with the two-way traffic of information until complete rehabilitation has been achieved.

Student Affiliation Plan

PHR brief

Few States can match Connecticut's record in tuberculosis nursing affiliation. Since the start of the affiliation program in 1948, nearly 700 students have trained in the care of tuberculosis patients at State sanatoriums. Connecticut is among the first States in which the official agency responsible for tuberculosis control has acted to promote tuberculosis education for nursing students.

Before tuberculosis experience could be possible for student nurses, the requirements of the State board of examiners for nursing had to be

By Louise Lincoln Cady, R.N., nursing education coordinator, Connecticut State Tuberculosis Commission.

met as to instruction and nursing practice. Teaching materials had to be prepared. Communicable disease precautions had to be established at the sanatoriums accepting students, and nursing procedures had to be revised. Qualified instructors had to be secured. Standards of sanatorium patient care had to be set so that students could learn good nursing by observing it.

Student Practice

At first, only a few sanatorium wards could be opened to student practice. Today, experience in nursing practice has been extended to include the complete range of sanatorium facilities. At present, nursing students from 15 of the 21 nursing schools in Connecticut are affiliating with 2 State sanatoriums. At least 15 former students have returned to the sanatoriums as graduate nurses.

Through classes with the director of the tuberculosis commission, the physician in charge of surveys, the public health nursing consultant, and a representative of the Connecticut Tuberculosis Association, the student learns the fundamentals of epidemiology and tuberculosis control—an understanding which is furthered by observation at the State's consultation clinics and community surveys.

The greatest factor in overcoming possible fear of tuberculosis on the part of the student is a good student health program at the sanatorium. A new student is given a tuberculin test and a chest X-ray, followed by periodic check-ups during her affiliation and for 2 years after. To date, 92 nurses have completed the 2-year follow-up.

Since every member of the sanatorium nursing team participates in teaching and supervising nursing students, there must be a continuous education program for the professional and nonprofessional nursing staff. The duties of each member should be carefully defined, and an orientation program should be prepared for each type of worker. Staff education programs vary. One part of the affiliation program has been to give nurses special experience in conditions which may complicate tuberculosis.

Students add to their knowledge of tuberculosis by attendance at medical and surgical conferences. These in combination with observation opportunities at rehabilitation conferences increase their understanding of the needs of the patient as a person and his family problems.

Patient Education

In the two sanatoriums with student affiliations, the students are given an opportunity to supplement the instruction given to patients by registered nurses. A program of patient education includes individual instruction at regular intervals, group instruction conducted on the wards, classes for women patients in homemaking and diet, and classes for patients whose discharge is pending.

One result of the student program has been to increase the desire of nurses in general hospitals to know more about the care of the tuberculosis patient. Greater interest in X-rays of general hospital admissions and in good health programs for the nursing staff has been another outcome.

The Connecticut Tuberculosis Association has contributed financial assistance for speakers addressing students and for observation opportunities afforded staff nurses. The unlimited cooperation of the tuberculosis commission, the sanatorium directors, and the schools of nursing has been highly effective in providing many students with the opportunity of tuberculosis affiliation.

The Health Educator

PHR brief

The health educator in the State Tuberculosis Commission acts as field representative in the organization of mass X-ray surveys in communities and industries. To be effective, he must know the mechanics of the complete program; he will plan programs with the physician in charge of surveys; he will coordinate activities of other staff members participating in survey organiza-

By William B. Parsons, M.S., assistant in health education, Connecticut State Tuberculosis Commission.

tion; and he will use the X-ray service as a springboard for health education.

A plan of procedure has been published outlining the operation of the mass survey, describing the committees required, and giving recommendations for avoiding pitfalls. The plan centers on an efficient appointment system which has been developed for smooth, continuous operation of the X-ray units.

Survey Committees

In making full use of his opportunity for health education, the educator acts as adviser to a local nucleus committee of well-informed, responsible citizens who are sincerely interested in the health of their community. The committee is usually composed of the over-all chairman of the survey and chairmen of canvassing, of appointments, of volunteers, of publicity, and of industrial arrangements. In addition, it includes the health officer, a representative of the public health nursing group, a practicing physician in the area, and a member of the town government. The health educator meets with the subcommittees on canvassing, appointments, and volunteers.

Several months before a survey, arrangements are made for talks before civic and fraternal organizations. Letters describing the purpose of the survey are sent to private physicians, ministers, clubs, and community groups. The publicity chairman and the health educator plan newspaper and radio announcements explaining the reasons for participating in the survey and the method of making reports. They arrange for posters, exhibits, and the distribution of leaflets descriptive of the survey procedures and results.

The Basic Facts

Because the canvassers are the ones who persuade their fellow citizens to participate in the survey, they must have the basic facts about tuberculosis. Each canvasser receives fact sheets and information booklets prepared by the health educator in preparation for "selling" the survey to the adult citizens of the town and for signing up individuals for appointment at the X-ray units.

The mechanics of the industrial phase of the mass X-ray survey program are simpler than in community surveys, but the problem of education is more difficult. No individual appointments are made by employees, and, therefore, by consent of the management, question-and-answer meetings are held with the plant foremen and department heads. The plant nurse is a key person in the industrial phase. If the foreman feels he cannot answer a specific question, he can refer to her. Posters, leaflets, and announcements are placed in strategic plant locations. Unions assist in educating their members and in encouraging participation.

In promoting X-rays, we stress:

The X-ray is the best single means of discovering chest disease in the early stages.

Chest X-ray is a good way to protect oneself, one's family, friends, and fellow-workers.

Of all persons X-rayed, 97 to 98 percent will have essentially normal chests. Their negative survey reports reassure them and serve as a permanent record of their condition at that time.

It takes only a minute to be X-rayed at the mobile unit—No one has to undress for examination—Everyone gets a confidential report on his chest film.

If X-ray findings are suspicious, see a doctor.

Recent Developments In Sanatorium Treatment

Medical and surgical treatments in the sanatorium have undergone revolutionary changes during the past decade, with even more dramatic changes in the past 5 years.

PAS and Streptomycin

Streptomycin, which was the first drug to show any notable antituberculous activity in the human, presented the two major obstacles of toxicity and development of resistance by the tubercle bacillus. Eventually, these barriers were markedly reduced and a satisfactory modality of administration was found. Para-

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aminosalicylic acid (PAS) was the next antituberculous drug to be discovered. Although possessing rather low levels of toxicity and resistance formation, its antituberculous activity was far less than that of streptomycin.

At the present time, these two drugs are administered in a combined intermittent regimen wherein 1 gram of streptomycin is given in one intramuscular dose every third day, and 12 grams of PAS are given by mouth daily in three divided doses. This method produces the maximal therapeutic effect with minimal toxicity and drug resistance. The exceptions are when streptomycin is administered intrathecally in meningitis and is given in 1- to 2-gram daily doses in tuberculous meningitis and generalized miliary tuberculosis.

None of these drugs are alone capable of producing a cure, particularly in tuberculosis of the lung. Usually some other form of therapy must be added to achieve complete control of the disease. Other drugs have been tested and found to be deficient in the treatment of human tuberculosis.

New Developments

The most recently discovered antituberculous drugs are the hydrazines of isonicotinic acid. They possess these valuable characteristics for treating tuberculosis, among others:

Easy and cheap to manufacture.
Easy to take by mouth.
Rapidly absorbed in the gastrointestinal tract.
Low toxicity.
Quick dispersion throughout the body.
Readily excreted through the kidneys.

However, we lack so much information concerning their effect on tuberculosis and about proper dosage, drug resistance, and other therapeutic measures that it is impossible to make any statement of their full value.

The surgical treatment of tuberculosis has paralleled medical advances. Many factors—better thoracic surgeons, better anesthesiology, available whole blood, antituberculous drugs, and better understanding of basic pathology and physiology in pulmonary tuberculosis—have assisted thoracic surgery in its developments.

Specifically, pneumonectomy, lobectomy, wedge and segmental resections, and pleuropneumonectomy are the recent surgical improvements which have occurred in the removal of tuberculous lung tissue.

The above-mentioned medical and surgical treatments are rarely used alone, but rather in combination. Former methods of treatment have not been discarded but have been reevaluated in the light of recent advances. Pneumothorax, pneumoperitoneum, and thoracoplasty are still useful procedures when properly applied. Mental and physical relaxation and rest still are the foundation stones of treatment. Sanatorium treatment is more necessary than ever because a broad therapeutic program is based on the judicious use of all forms of therapy.

WHO Fellowships for U. S. Citizens Not Available

The 5th General Assembly of the World Health Organization adopted a resolution instructing the Director General to give preference in awarding fellowships for at least the next 3 years to candidates from underdeveloped countries. Funds, therefore, are no longer available to support fellowships for United States citizens.