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Body Mechanisms in Progressive Tuberculosis

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The course of pulmonary tuberculosis is influenced by the interaction of many complex factors. The number and virulence of tubercle bacilli present in the lesion is balanced against the host's constitutional ability to limit their growth, resist tissue destruction, and isolate with fibrosis the areas of infection.

The philosophy of management in tuberculosis may be stated simply. One must close cavitary defects and limit or retard the growth of tubercle bacilli. The constitutional resistance of the host must then continue to hold tubercle bacilli in check and maintain barriers against their growth.

Although the exact nature of the body mechanisms which contribute to resistance against tuberculosis is to a large extent speculative, the existence of such factors is, however, demonstrable in animals, as in the work of Lurie with rabbits (*1*). Immune or resistant mechanisms in the human are somewhat more difficult to demonstrate except by analogy. It is possible, however, to formulate from isolated observations a concept of the physiologic and chemical factors which to some extent contribute to host resistance against the spread of tuberculosis or which, when deficient, permit progression of tuberculosis. It must be recognized that complex emotional influences contribute to and precipitate the physiologic mechanisms which produce favorable conditions for progressive tuberculosis.

The controlled study of streptomycin therapy has demonstrated that constitutional factors significantly affect the prognosis in pulmonary tuberculosis. The table below is suggested by a theory of Long and Ferebee which postulates that a given tuberculous population may show three major tendencies caused by the influence upon the prognosis of constitutional and other nonbacterial factors (*2*, *3*). One tendency is toward progressive disease and death. The other tendency is toward arrest and cure. In the third, a part of the population will not have either a marked tendency to progression or to

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recovery. This analysis indicates that the group which tends toward recovery and the group which is doubtful in prognosis are most helped by the administration of streptomycin. The group experiencing the least favorable tendency to recover shows only a prolongation of life and temporary improvement.

The influence of constitutional factors upon the response to streptomycin treatment

Predisposition of patients to recovery	Changes in X-ray lesions and symptoms	
	In streptomycin-treated patients	In patients treated without streptomycin
Favorable	More rapid and striking	Improvement occurs more slowly.
Doubtful	An increased number of favorable changes—some unfavorable.	Improvement not as frequent and unfavorable changes more frequent.
Unfavorable	Progression of disease delayed. Deaths occur later in the observation period. Symptoms initially improve.	Rapid progression of lung lesions and death early in the period of observation. Slight if any improvement in symptoms.

A current study of patients treated in the Howard University Chronic Chest Disease Service confirms this theory. The dosage of streptomycin bears no direct relation to the recovery of tuberculous patients. Partial analysis of hospital data indicates that groups treated with streptomycin experience a prognosis comparable to that of untreated groups despite the fact that patients with unfavorable outcomes received more drug for longer periods. If observation is sufficiently prolonged, it is seen that streptomycin administration has prolonged life but gives no lasting improvement in the prognosis.

Medlar and others have stressed the importance of apical foci in the pathogenesis of progressive pulmonary tuberculosis (*4–7*). Pinner called these "apical nodular foci" and believed that there was much evidence to support the theory of Loeschke that these lesions precede, in many instances, the development of subapical lesions with which we are clinically familiar (*8*).

Medlar has demonstrated that many of these apical nodular foci, though encapsulated and sometimes even partially calcified, contain caseous matter and virulent bacilli.

These lesions when observed on chest X-rays have been loosely called inactive apical nodules, apical scars, or pleural caps. The process of breakdown of these inactive lesions can be observed on serial films with sufficient frequency to justify the pathologists' earlier contention that the apical tuberculous nidus may frequently be the source of progressive pulmonary tuberculosis.

This is confirmed by the fact that many of our tuberculous patients are now in the ages past 50. These patients, for the most part, will have experienced contact and inoculation of the lung with tubercle bacilli many years before becoming ill of progressive tuberculosis.

We may assume from observation of these patients that host-

resistance remained adequate to the suppression of bacillary growth for varying periods up to many years. Progressive tuberculosis may develop if physiologic deficiencies occur. The severity of progression is probably related to the duration and degree of disturbed metabolism.

The physiologic changes which precede or facilitate breakdown of these lesions, although often smaller in degree, must be comparable in kind to those which operate to make clinical tuberculosis acutely progressive.

Exogenous infection may also, within a short period of time, cause progressive pulmonary tuberculosis. The physiologic factors which lower resistance, if operative at the time of such infections, facilitate immediate extension of disease into the acute phase.

Whether the first episode of progressive disease is the immediate or remote consequence of exogenous infection, we are concerned largely with the type of pulmonary tuberculosis characterized by the exudation of plasma containing cells, fibrin, and bacilli into the organ interstices and resulting eventually in massive death of cells, caseation, softening, and cavitation. Fresh fibrosis in acutely progressive tuberculosis does not develop as rapidly or in sufficient amounts to form an efficient protective barrier against continued tissue injury. It must be realized that all exudative tuberculosis is potentially progressive regardless of extent and that as a general rule progression is acute and healing slow.

Physiology of Constitutional Resistance

The early tuberculosis workers recognized the existence of acutely progressive forms of tuberculosis and attributed their occurrences to constitutional weakness, inherited predisposition, or to habit.

The existence of constitutional resistance is unquestioned. The solution of the clinical problems of tuberculosis, however, depends upon the recognition of the exact physiologic processes which when enhanced or impaired influence the characteristics of tuberculous disease once it develops.

Lurie has conclusively demonstrated that constitutional resistance and susceptibility can be inbred in strains of rabbits (*1*). From observation of infected rabbits, he associates the hypertrophy of the adrenals with resistance to tuberculosis. He finds that cortisone suppresses allergic manifestations, increases growth of bacilli within phagocytes, and diminishes antibody formation. The withdrawal of cortisone caused death due to massive tuberculous pneumonia.

Other workers have concluded that cortisone has a definitely harmful effect on the course of experimental tuberculosis (*9*). Our own observation has been that ACTH used in two patients produced massive pneumonic lesions in one and led to the resolution of productive tissue and development of empyema necessitatus and multiple

chest wall abscesses in another. A third arrested patient treated for two periods of 3 weeks with ACTH, 25 mg. every 6 hours, showed no spread and was able to survive two severe bouts of delirium tremens apparently because of the drug.

Selye (*10*) has interpreted his observations upon experimental animals subjected to nervous strain, trauma, fatigue, infections, intoxications, heat, or cold as indicative of the fact that there is a general response superimposed upon the specific effects of "stressor agents." He postulates a "general adaptation syndrome" composed of three stages:

1. *The Alarm Reaction.* The development of adreno-cortical enlargement, thymo-lymphatic involution, and symptoms of shock.

2. *Stage of Resistance.* The development of adaptive changes in which the effects of stress are balanced.

3. *Stage of Exhaustion.* The loss of balance or adaptation to stress.

He further believes that derangements of this syndrome may produce organ deficiencies in the nervous system, kidneys, and liver, due to imbalance in the anterior pituitary-adreno-cortical-organ system. A number of complex hormones must act in delicate balance to maintain the stage of resistance. ACTH induces the production of adrenal cortex hormones which exert an inhibitory effect upon diseased organs, enhancing catabolic changes, diminishing granulomatous changes, and inhibiting allergic response. Conversely, the other anterior pituitary hormone STH in concert with adrenal hormones of the desoxy-cortico-steriod type, stimulates diseased organs to anabolic activity, granuloma formation, allergic sensitivity, and connective tissue proliferation.

It seems probable that abnormalities in the STH-mineralo-cortoid balance with ACTH-gluco-cortoid system may diminish the protective response of the lung to infection with tubercle bacilli. Genotypic or acquired abnormalities of metabolism may cause such imbalance. Since the anterior pituitary hormones are complex proteins, it may be that amino-acid deficiencies or protein depletion prevents their adequate production by the gland.

Kahn (*11*) recently postulated that the catabolic changes which are constantly taking place in the body are responsible for cellular disintegration. The release of cellular lipid substances evokes a typical pattern of antibody responses. These may be demonstrated by a complex agglutination test similar to the Kahn test used in syphilis. Kahn shows characteristic patterns of agglutination for yaws, syphilis, tuberculosis, and malaria. In addition, agglutination patterns were demonstrated for normal persons residing in Michigan and for Navaho Indians. It is striking that the agglutination patterns for apparently well Navaho Indians and those of tuberculous patients are similar. It may be postulated that under certain condi-

tions of infection, persons experiencing a negative metabolic balance and cellular disintegration may be more likely to develop progressive tuberculosis. Confirmation of Kahn's thesis may add to our armament a valuable tool for the evaluation of resistance to tuberculosis.

Cannon states that protein or essential amino-acid deficiencies lead to metabolic deterioration, loss of body weight, nitrogen deficiency, loss of appetite, and a feeling of malaise (*12*).

A balanced adequate amino-acid intake is of primary importance in growth, in severe infections, and in the maintenance of resistance through the protein role in the fabrication of specific antibodies. Amino-acid depletion impairs the immunologic functions of the reticulo-endothelial system and blood forming tissues, and the production of enzymes. Phagocytic blood cells diminish in the presence of protein depletion.

Damaged organs and depleted organs draw first from the available stocks of body protein. These organs may appropriate a large share of available protein. When this occurs the liver and anterior pituitary, important as they are to maintenance of resistance, may fail to obtain the protein essential to their function.

A "protein pool" exists in the muscles, liver, tissue cells in general, the hemoglobin, and the plasma protein (*13*). A labile transitional fraction of the protein in liver, cells, and muscles may enter the plasma store in answer to an increase in protein requirements. The globin of hemoglobin is favored in protein synthesis and apparently exerts priorities upon the transitional protein. It is lost only where protein depletion becomes severe. Anemia does occur before marked changes in the plasma protein are present.

Prime indicators of protein deficiency are:

Loss of body weight.
Hypochromic anemia.
Leucopenia.
Loss of muscular strength.
Slow wound healing.
Deficient hormone, antibody, and enzyme synthesis.
Lymphoid depletion.

Smit, medical director of Springfield Hospital, Durban, Union of South Africa, reports (*14*) autopsy observations which show that massive caseous lesions of lungs and lymph nodes, indicative of poor resistance, occur with greatest frequency in the younger age groups of Bantu laborers and that lesions in older Bantus tended to be similar to those he found at autopsy in more resistant groups. He also reports that parenchymatous liver damage is almost universally present on biopsy and autopsy in the poorly resistant Bantu and rarely in the more resistant racial and cultural groups.

Recent work by Hackney on our service indicates that decreases

of the albumen-globulin ratio, a positive cephalin-cholesterol flocculation test, and the degeneration of liver cord cells are frequent in a group of adult Negro patients hospitalized for tuberculosis (*15*).

Gillem precipitated from the plasma of progressive tuberculous patients abnormal amounts of a globulin resembling in many respects the globulins reported present in progressive tuberculosis by electroporetic analysis by Siebert (*16*).

The available evidence leads to a hypothesis concerning the basic physiologic mechanisms which influence resistance to progressive tuberculosis.

1. Present theory indicates that a balance between complex protein molecules or hormones produced by the anterior pituitary gland stimulates a defense reaction against infection or stress. One of these hormones (STH) is particularly responsible for productive or fibrotic changes, allergic response, and phagocytic activity.

2. The balance between catabolic and anabolic activities is disturbed in tuberculosis. Conditions, such as malnutrition, growth, pregnancy, chronic infection, diabetes, alcoholism, intestinal disease or extreme physical exertion, place the various depleted organ systems in competition for the essential protein materials required for healing the diseased lung.

3. Imbalance in protein metabolism, whether inborn or acquired, may be reponsible for lowered resistance to progressive tuberculosis through insufficiencies in the essential amino acids needed to build hormones, antibodies, and phagocytes and to replace destroyed body cells.

4. Deficient constitutional resistance to progressive tuberculosis may logically be explained by the existence of protein depletion as a predisposing factor or as an influence occurring in consequence of the disease.

Clinical Management of Progressive Tuberculosis

The considerations discussed above should lead to practical conclusions useful in treatment.

First of all, the breakdown of preclinical apical nodular tuberculosis first seen in clinics or surveys may be prevented to some extent if these patients are given good medical supervision.

Diabetes, pregnancy, nephritis, physical exhaustion, occupational hazards, alcoholism, or psychic trauma may contribute to a dangerous state of protein depletion. It therefore seems reasonable to propose that patients discovered in chest clinics or surveys receive careful clinical interviews, physical examinations, and routine laboratory checks to determine the existence of such conditions. The patient should be educated about diet, personal hygiene, adequate rest, and

the importance of regular chest X-rays even after the lesion has been determined inactive. Social work should be intelligently employed to relieve emotional stress and to help with personal and family problems before these patients break down. The early placement of these patients in safe vocations is often neglected as a preventive procedure.

The physician must be guided by a broad knowledge of the race-age-sex-occupation-specific risks of breakdown in his teaching of patients and recommendations for chest X-ray follow-up.

Patients with apical scars or apical nodular tuberculous infiltration may not develop clinical tuberculosis for years, if they ever do. Specific treatment for tuberculosis is, therefore, not needed. Preventive therapy must be based on treatment of metabolic disorders, correction of deranged physiology, especially protein depletion, and a generally competent medical survey of the whole patient.

The clinically ill patient with tuberculosis requires a more active program of treatment.

Rest Therapy

The prescription of rest should be administered as conscientiously as that of antibiotics and should be accompanied by active efforts to relieve stress and muscular tension. The technique of Jacobson for the teaching of muscular relaxation may be employed by physicians and nurses in teaching rest. In hospitals, a rest-therapy-team composed of a physician, social worker, an occupational therapist, and nurse should actively schedule intensive teaching for each patient until he has learned the techniques of actual rest and relaxation.

Smit reports that patients who are taught to rest lying on the affected side with an 18-inch elevation of the foot of the bed showed results comparable to those obtained with pneumoperitoneum (*14*). This technique is worth further study.

Antibiotic Therapy

The employment of streptomycin and PAS in combination is essential. Fixed periods of administration should be avoided. The duration of streptomycin treatment cannot be predetermined for patients with progressive tuberculosis. Two grams of streptomycin or dihydrostreptomycin every third day with 12 grams of PAS daily may be required for 4 to 6 months. This treatment should be continued until body weight, sedimentation rate, plasma protein levels, and the percentage of hemoglobin return to normal levels. The conversion of the sputum to negative should be regarded as showing bacteriologic recovery. Evidence of physiologic recovery is important to an enduring cure.

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Protein Therapy

Loss of body weight, hypochromic anemia, loss of appetite and muscular strength are indicative of protein depletion. Our own studies indicate that evidences of hepatic insufficiency and deficient protein metabolism are more common than realized among patients experiencing progressive pulmonary tuberculosis (*15*). These evidences are a positive cephalin-cholesterol flocculation test, reversal or decrease in the ratio of plasma albumen to globulin, a microcytic hypochromic anemia, and parynchymatous degenerative changes in the hepatic cells.

On this basis, we propose that balanced amino-acid digests be used as medicinal agents in sufficient amount to supply an additional 1.5 gram of protein per kilo. These are given after meals as soups, or in suitable media. The protein digest which we are employing is a 65-percent mixture of yeast, skim milk, pancreas, beef heart, yeast and liver proteins supplied by Armour Laboratories. A daily dose of 180 grams provides approximately 110 grams of protein supplement. This medication should be continued until evidence of protein repletion and stable disease is obtained. An adequate basal diet of 2,800 to 3,000 calories containing approximately 90 grams of protein is given. This prevents consumption of the amino-acid supplement to supply caloric needs.

As aids to the protein metabolism, we employ B vitamin, crude liver extract, and ascorbic acid along with the protein digest. The use of methionine, 5 grams, or choline, 5 grams, daily has seemed to be of value in this regimen.

Collapse Therapy

The full employment of pneumothorax, pneumoperitoneum, and surgical collapse along with all other measures is, of course, necessary. The institution of collapse therapy along with measures directed toward general physical restitution and control of infection is important.

Graduated Exercise, Rehabilitation, and Occupational Therapy

The patient who recovers from the febrile catabolic phase of tuberculosis must, as soon as feasible, be returned to physical activity in graduated steps. Studies in surgical convalescence during World War II indicated that the maintenance of nitrogen balance and the healing of damaged tissues was facilitated by the resumption of physical activity. This procedure must be intelligently individualized. Occupational therapy is an important factor in treatment by graduated activity since the physical efforts involved may be supervised and graded. During this period the patient should be observed carefully.

Trends in weight, hemoglobin, appetite, and sedimentation rate should be considered along with the chest film in determining the permissible activity.

Education in a proper dietary regimen is important. Hospital dietitians should teach patients and their families the essentials of a proper basic diet.

The patient needs close supervision and direction, until he makes a proper vocational adjustment, if his recovery from progesssive disease is to be maintained. Persons ill of progressive tuberculosis are less able to feel secure in a chance acquired job after recovery. The bad influence of unsuitable employment upon tuberculous patients is well established but not generally anticipated by physicians in planning management.

Conclusions

1. Constitutional resistance plays a large part in the pathogenesis, treatment of, and recovery from, progressive tuberculosis.

2. Physiologic and metabolic derangements which precede and accompany the development of progressive tuberculosis play a role more potent than that of the bacterial population which cannot be permanently controlled unless the host's resistance improves.

3. Protein depletion diminishes the constitutional resistance to tuberculous progression. The amounts of protein required in the course of progressive pulmonary tuberculosis are probably much in excess of those customarily supplied in the diet.

4. Antibiotics, collapse therapy, rest, graduated exercise, social services, and proper job placement after recovery must be skillfully employed in the therapy of progressive tuberculosis with proper regard to the indications of protein repletion or depletion.

5. Active medical management of patients who show apical nodular tuberculosis may prevent the development of progressive tuberculosis in subsequent years. The early recognition and treatment of metabolic abnormalities, alcoholism, gastric or intestinal disorders, malnutrition, and other conditions which contribute to protein depletion may prevent the progression of tuberculous lesions.

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Nursing in Tuberculosis Hospitals

By Martha Ball Naylor, R.N., M.P.H.*

Skilled nursing care is one of the services essential to the recovery of the patient with tuberculosis. Yet there is not enough good care available to him.

This is a situation all too familiar to health leaders. It constitutes a difficult problem which will continue, despite declining death rates, unless we now face it squarely, determine the reasons for it, and do something about it.

Many beds in hospitals for the care of tuberculous patients are closed, although tuberculosis is still seventh on the list of causes of death in the United States and new hospitals are being built in many areas. The reasons behind this paradox are indicated by information collected in connection with the Index of Hospitals with Tuberculosis Beds, (*1*) covering about 600 hospitals with a rated bed capacity of 88,000 beds. Ninety-three of these hospitals, with a total of 24,300 beds, reported that 5,200, or more than 20 percent of their beds were not in use. Three hundred and eighty closed beds were due to lack of physicians; 1,500 (or about 30 percent of vacant beds) to lack of

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nurses and an additional 1,700 to lack of both doctors and nurses. Lack of nurses was a cause contributing to the nonuse of more than one-third of the remaining 1,600 unused beds.

There are other figures even more revealing (*2*). Although 5.8 percent of the total occupied hospital beds in the country are used by tuberculosis patients, only 3.3 percent of the professional nurses working in all hospitals are employed in tuberculosis hospitals. In the general hospitals there is one professional nurse for each 2.5 patients while in tuberculosis hospitals there is one for each 10.6 patients. In the general hospitals there is one professional nurse for each 0.8 auxiliary nursing worker; in tuberculosis hospitals there is one for each 2.1 auxiliary nursing worker.

The above data indicate that the deficit of nurses in tuberculosis hospitals is not the only reason for closed beds. The tuberculosis patient needs care from a variety of workers, both professional and nonprofessional, many of whom are at a premium in the hospital labor market today. For example, doctors with a special knowledge of and interest in tuberculosis work are few in comparison with the many needed. Only a handful of medical social workers are employed in the tuberculosis field. In the hospitals, qualified dietitians are scarce or even absent. Housekeeping and maintenance departments are generally short staffed and in many instances the workers recruited are not of a high enough caliber and are not adequately trained to give satisfactory service without an excessive amount of supervision.

But it is with nursing that we are here primarily concerned. The care of the tuberculous patient should be a real challenge to a nurse. It requires the sympathetic approach and technical skills needed in all good basic nursing care. In addition, it calls for a knowledge of the disease, an understanding of the measures which can protect hospital personnel from it, and thoughtful consideration of the emotional and socioeconomic problems with which the patient needs help.

Why, then, does the tuberculosis service have great difficulty recruiting and keeping nursing personnel? (*3*)

To answer this question, we have studied approximately 45 tuberculosis services in general hospitals and in special hospitals and sanatoria in 12 States and the District of Columbia. The Philadelphia, Pa., area (referred to below as the community study area) was the one observed most intensively, and it is to conditions there that references are most frequently made in this paper. All of the institutions covered recognized the need for self improvement and requested that a survey of their facilities be made by the Public Health Service. It follows that, in general, hospitals with more complete services in which problems are being met by their own staffs were not visited.

Details of conditions in hospitals studied vary from community to community, but the over-all pattern occurs frequently enough to warrant thorough discussion. If this pattern is brought clearly into focus, we will, perhaps, be able to reach some definite conclusions as to what might be done to better it.

Does the Tuberculosis Hospital Offer a Nurse the Chance To Do a Good Job?

A young woman trying to choose between several nursing positions or fields weighs many different factors. Salary may be important to her, but it is likely to be less decisive than the satisfaction of being able to do a good job, a job that will help her patient get well and return to a useful life. In the especially expressive words of Dr. Esther Lucile Brown (*4*): ". . . to witness and also to influence growth, development, and change, not only in childhood but during all stages of life; to observe and treat the never absent but infinitely variable emotional component of disease; to be a participant in community efforts to protect health and to condition persons in the maintenance of health. What is the importance of 'unpleasant tasks' when compared with opportunities such as these?"

The tuberculosis hospital offers the nurse a difficult task, but it can be a highly interesting one. Here patients, infected with a chronic, communicable disease, often face serious personal upheavals which interfere with their receptiveness to the care which is essential to eventual recovery. They must be treated with understanding and freed from unnecessary strain and worry. One cannot give nursing care to a woman with tuberculosis, for example, without recognizing that a large factor in her eventual prognosis is her worry about how well the foster home is caring for her 18-month-old baby, nor to a manual worker without sensing that he will never be able to do hard labor again.

How Much Service Can She Give?

The average nurse wishes to give time to the refinements as well as to the essentials of nursing care. She knows, however, that in a job in an understaffed tuberculosis hospital, she would be under such pressure that she would be unable to meet her own standards as developed by her professional education and experience. Thus the vicious circle continues: There are not enough nurses in tuberculosis services and this situation creates conditions which in themselves keep nurses away.

Recommendations for standards of nursing care in tuberculosis hospitals were made as the result of a study in 1938 (*5*).[1] These were:

[1] For similar standards in general hospitals see reference (*6*).

In each 24-hour day, 3.3 bedside nursing hours per bed-surgical patient; 2.7, per bed-medical patient; 1.5, per semi-ambulant patient; 0.5, per ambulant patient.

Thirteen years have passed since these recommendations were made, and all too many of the tuberculosis hospitals and sanatoria have been unable to employ enough nurses to make them actualities. In one hospital studied, for instance, there was a 65-percent deficit in nursing care for each 24-hour day. In the community where 10 hospitals were studied, 2 general hospitals with comparatively small tuberculosis services which offered largely surgical care were the only ones which attained or exceeded the minimum hours of nursing care recommended.

The general hospitals in this area furnished a higher proportion of professional nursing care than the tuberculosis hospitals. An average of about 30 percent of the tuberculosis nursing care in the general hospitals was given by nonprofessional workers and 70 percent by professional nurses. About 40 percent was given by undergraduate students and 30 percent by graduate nurses. In tuberculosis hospitals, these figures were reversed: 70 percent of the care was given by nonprofessional workers and 30 percent by professional nurses. No part of the nursing care was provided by undergraduate professional nurses.

Too often one finds the tendency on the part of tuberculosis hospitals to use a lower standard of bedside nursing-care hours in staffing than that used by the general hospitals (*6*). Too often indeed, these tuberculosis hospitals have not accepted the principle that standards of care at least comparable to those attained in the medical and surgical wards of general hospitals should be provided. This approach might have been justifiable when tuberculosis was treated principally with rest, diet, and fresh air. But it certainly is not today, when modern treatment for the disease includes not only rest, but also surgery and extensive chemotherapy.

It is a credit to nurses everywhere that in spite of dire personnel shortages no specific instances which could be interpreted as neglect of patients were observed in the hospitals studied. Nurses are the first to point out deficiencies and are always most unhappy about them. They give critically ill patients priority for care; others have to get along with less than desirable. They are able to give little of the teaching or supervision of hygienic habits so necessary to getting well and staying well once discharged from the hospital. And how can they give adequate attention to education and details of protective measures when they must let patients who are supposed to be on complete bed rest make their own beds?

Are the Hospital's Physical Facilities Adequate?

Even if she is challenged by the opportunities for service in a tuberculosis hospital, a nurse might be discouraged with the prospect

of its facilities. Perhaps she won't mind its isolated location, but she is likely to object to the inconvenient, rambling manner in which so many sanatoria are constructed. One, for example, houses its 185 patients in 11 different buildings. Its nurses perforce waste much valuable time and effort walking. On balmy spring days this extra traveling might be a pleasure; in the rain or snow it is an unpleasant, time-consuming chore. In any event, since it is physically impossible to reach patients quickly either in routine situations or in such emergencies as sudden hemorrhaging, the patient is not assured of the care he needs.

Studies have shown the need for better planning of facilities for tuberculosis nursing care and through professional education and experience, nurses have learned a great deal to contribute to this planning. They well know, for instance, the importance of well-placed handwashing facilities. However, these, as will be seen in detail below, are sometimes nonexistent and frequently antiquated. Patients are generally admitted directly to the beds they will occupy during their stay since few hospitals have admission rooms or wards for them. There are usually not sufficient single rooms to provide for flexibility in segregation of patients and to permit individualized care on the basis of the needs of the patient. All such situations greatly magnify problems of nursing administration, waste professional time, contribute to staff dissatisfaction, and in these ways make for a lower standard of nursing service to patients.

Is She Protected From Undue Exposure by Protective Measures?

Nurses might be asked to put up with inconveniences, but it is quite another matter to expect them to care for patients without the means to protect themselves from a disease that is known to spread by contact. "In the tuberculosis ward or hospital," writes Dr. R. J. Anderson (*7*), "the nurse often finds the communicability of the disease treated lightly, and frequently finds doctors disagreeing about protective measures."

Effective protective measures for patient care should be agreed upon and accepted as essential in preventing the spread of tuberculosis. The principle underlying such measures is that tubercle bacilli must be destroyed as promptly and as near the source of dissemination as possible and that patients, visitors, and all concerned with patient care must share responsibility for these measures. The purpose is simple: to serve patients with clean supplies, equipment and food, with clean hands, in a clean environment. The most important of the measures which make the attainment of this purpose possible follow.

Personnel and Patient Education Programs. There are very few planned, coordinated educational programs to which all the various

professional disciplines in the hospitals make their special contributions. In many tuberculosis services these "programs," the success of which greatly influences the degree of contamination of the hospital environment, are limited largely to instruction in bospital regulations about rest or meal hours or care of sputum. Though routines may be wisely prescribed, the reasons underlying them are often inadequately explained. In hospitals where a large proportion of nurses have not had clinical experience in tuberculosis services, where much of the care is given by nonprofessional workers, where there is a high turnover of personnel, and where, as is always the case, effective protective measures are dependent upon the conscientiousness and practice of each individual, continuous staff education programs are essential.

Real knowledge of the disease is essential to gaining the patient's favorable response for his own care. It follows that it is also essential to the protection of all hospital personnel, while the patient is institutionalized, and to his family, after discharge. "The only real safeguards," according to Safer Ways in Nursing, "are the knowledge and understanding the nurse possesses, applies to herself, and passes on to patients. This knowledge should encompass the prevalence of bacteria, their menace to health, mode of transmission, pathways of entrance to the body, and particularly the means that may be employed to destroy them."

Emotional and Psychological Aspects of Protective Practices. Nurses who have worked extensively with patient education programs report that patients are the first to express a sense of relief when good practices are instituted. Personnel should always be concerned with patients' reactions to these practices and indeed should be aware of the psychological and emotional factors which are an integral part of nursing care. Good practices assist in overcoming fear of communicability of the disease. Accompanied by a vigorous in-service staff education program, they aid in attracting and keeping all personnel in tuberculosis services.

The Importance of Handwashing. If a hospital is to maintain environmental cleanliness, patients and workers must have hygienic habits. Since hands are a common medium of contact between workers and equipment and between patients and workers, clean hands are essential to the practice of aseptic technique. Our surveys indicate that the "when" of handwashing (after the hands are contaminated) is usually better taught than the "how" (by the use of soap, running water, and friction). Many tuberculosis hospital employees, particularly the nonprofessional personnel on the nursing staff, do not know what is meant by thorough and frequent handwashing as it is applied in communicable disease nursing, nor can they be expected to know without considerably more teaching and supervision.

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Moreover, handwashing facilities in most services are sadly inadequate and inconveniently located. Few have foot or knee water control; most water control is by hand-operated single faucets without gooseneck water mixers. A few institutions still offer their personnel handwashing facilities which can only be described as primitive: basins placed on tables in hallways.

Though paper towels are supplied for drying the hands of workers in most tuberculosis services, the common towel has by no means vanished. Even when paper towels are used, they are often in short supply and are sometimes hand drawn from a pile of towels on a window ledge or table, instead of from an approved dispenser.

Safe System for Disposal of Sputum. Since the chief source of tubercle bacilli is the secretions from the infected patient's nose and mouth, safe measures for the disposal of this material are highly significant. The majority of hospitals supply tissues for collection of sputum. Some use both sputum cups and tissues; most provide paper bags near the bedside for the immediate disposal of these tissues, with routine collection of bags, and final disposition by burning. On the whole, techniques in this field are fairly well regulated, though most of the hospitals studied could improve them by supplying nonpermeable tissues of proper size, by installing centrally located incinerators, and by thoroughly teaching the principles behind prescribed routines.

Cleansing and Sterilization of Utensils. Bedpans, urinals, hand basins, and emesis basins are often cared for in inconsistent fashion. For example, emesis basins for the care of sputum, the chief source of tubercle bacilli, are expected to be grossly contaminated. But they may be sterilized only once a week, while bedpans are sterilized after each use. Some institutions are completely without sterilizers for equipment used in the bedside care of patients. Ideally, all utensils should be sterilized after each use.

Thermometer Care. Procedures of thermometer care are often poorly planned and their practice is often haphazard. Three factors should be considered in planning for thermometer disinfection in tuberculosis services: First, tubercle bacilli are more difficult to destroy than most other organisms, and because of their presence in the patient's sputum, oral thermometers should be presumed to be grossly contaminated. Second, when chemical disinfection is relied upon for any article, it must first be thoroughly cleansed with soap, water, and friction and rinsed with clear water. Third, selection of the disinfection agent, its temperature, and the length of time of immersion in it, are all basic principles to be considered in the disinfecting process.

It is plain that these principles are violated when group technique is practiced and as many as 35 patients are given thermometers before

any are picked up; or when individual technique is used and thermometers are kept at the bedside, where effective cleansing and disinfection is generally lacking, and where they are stored in a contaminated area; or, when patients are "taught" to take their own temperature, and the practice is sloppy because it is usually not possible to give adequate professional supervision when the individual patient is relied on completely for taking his own temperature.

Some tuberculosis hospitals have evaluated the need for temperature taking on the basis of the use which is made of recorded data, and have found that about three-fourths of it could be eliminated without interfering with patient treatment. In any case, temperature taking procedures should be reviewed and revised periodically by medical and nursing staffs. When temperature taking is essential to diagnosis or treatment, it should be done by trained nursing personnel who practice a technique which will keep instruments free from tubercle bacilli. This is the simpler, safer, and more accurate way.

Protective Clothing. Routines concerning gown, cap, and mask protection differ considerably in the different hospitals. The nurse should be provided with a clean, ironed gown which covers her clothing completely when there is danger that it might be contaminated. In most institutions, however, gowns are used in a limited way, though in some they are employed as a matter of course in all patient areas. Lack of well-equipped gown rooms and a short supply of gowns often interfere with the planning and practice of good gown technique.

Caps which cover the hair completely help keep the hair free from tubercle bacilli from the patient's cough and from contaminated dust particles. They also prevent hair from falling over the face, offset the worker's tendency to brush it back with contaminated hands, and facilitate efficient wearing and removal of certain styles of masks. It is common practice, however, for nurses to wear only their regulation nursing caps on the job.

There is evidence to indicate that under carefully controlled procedures, masks do protect against the inhalation of tubercle bacilli (*9, 10*). However, experts believe that unless they are properly constructed, worn, handled, washed, and sterilized, they may be a hazard rather than a protection to the wearer. Mask techniques observed in tuberculosis services demonstrate the lack of understanding of the basic principles involved in good practice. Some use masks infrequently, others in selected areas, or while giving bedside care to patients only.

Supplementary Services Important to Protective Measures. Housekeeping, handling of clean and contaminated linens, laundry procedures, and food preparation, serving, and dishwashing are all extremely important to the sanitation and safety of the tuberculosis

hospital. Unless isolation techniques extend to these services, poor practice can negate much that is essential to a safe working environment. There is a real need for leadership, teaching, and supervision from the professional staff for personnel in these services who cannot be expected to have specific knowledge of communicable disease precautions.

Housekeeping. "The world in which the tuberculosis patient spends 24 hours a day is bounded by surfaces," says Safer Ways in Nursing. "When he is indoors he is surrounded by walls, floors, and ceiling. He wraps himself in garments and bed clothing. He uses a variety of furnishings and utensils. All of them become contaminated with dust and—what is more important—with tubercle bacilli . . . Good housekeeping in the care of the tuberculous patient, as of patients with other communicable diseases, serves several vital purposes. It makes the patient more comfortable, physically and mentally. It protects him from cross infection. It protects the uninfected from the organisms which cause disease" (*11*).

For all these reasons, professional guidance is needed in setting up housekeeping procedures. In institutions where nurses are in charge of housekeeping along with all their other responsibilities, there should be housekeepers to assist them. There is a good deal of merit in having the head nurse in a communicable disease service take some responsibility for housekeeping, but it should be only that part which strengthens her staff's contribution to safe nursing practices.

She could be responsible, for instance, for seeing that all dust and dirt are considered contaminated, handled gently and as little as possible, and disposed of promptly. Most institutions seem to realize this, but after the collection of dust there may be careless handling of dry sweepings. Often they are placed loose in trash cans or chutes where they have to be handled again by workers collecting for final disposal by burning.

She could also make sure that floors are considered contaminated by all personnel and are kept free from dirt, especially dry, loose dust. This is best accomplished by damp cleaning, and, when damp cleaning is not possible, by approved procedures for dust control (*12*). When sputum bags and contaminated linens are placed on floors, there is no real understanding of housekeeping principles in a communicable disease hospital.

Linen and laundry service. The patient's soiled bed linens, or his night gown or shirt, may be contaminated. Fortunately, standard laundering techniques can disinfect as well as clean, and if the hospital environment is to be a safe one, these techniques must be carried out efficiently. Laundry supervisors in hospitals have usually learned their business through experience and know how to handle their jobs. Nevertheless, they cannot provide patients with really clean linens

and clothes when the water at their disposal is not hot enough to maintain standards recommended by the American Institute of Laundering. In the community study area, 4 out of the 10 hospitals reported the water was not hot enough at peak requirements to destroy tubercle bacilli.

Food handling and dishwashing. The way in which food is handled and served is particularly significant in the tuberculosis service, since oral secretions are a source of contamination. If food is handled by healthy workers and cleanliness is maintained in food preparation and service, the possibilities of personnel conveying infections to patients and of patients conveying tubercle bacilli to healthy personnel are minimized.

Food should be prepared in hygienic surroundings, and preemployment health examinations should ascertain the food handlers' good health. On the job, these food handlers should be taught by supervision and demonstration some of the basic facts of asepsis. Such instruction is meaningless, however, if workers do not have ample facilities with which to carry them out. In many hospital kitchens there are no handwashing sinks, and food preparation sinks are used for this purpose.

It stands to reason that food should be served in such a way that transmission of tubercle bacilli is impossible. In most hospitals food for patients is cooked in kitchens separated from patient areas; in some, food for personnel is prepared in a separate kitchen. Separate dining rooms, or at least separate tables, are usually provided hospital personnel. In general, however, there is not enough thought given to contamination of food during and after its preparation. Milk especially should be received and served in the same single service container so that it will not change containers in contaminated areas several times before it is given to patients.

It is essential that dishes be thoroughly cleansed and sterilized after each use, and most services possess dishwashing machines to do the job. However, even a good machine needs maintenance, and operators need some professional supervision and instruction as to safe practices. In many of the hospitals observed, machines are not equipped with temperature control and no one has been careful enough to check on the hot water depended on to cleanse dishes. A typical hospital washes and rinses its dishes at 130° F., a temperature too cool to sterilize dishes. In many small institutions, dishes are washed by hand, and to disinfect them properly is a tedious job which requires even more supervision than a mechanical dishwasher.

Dishwashing problems, in fact all sanitation problems in the tuberculosis services, are, of course, tied up with the many problems of personnel administration. How can the dietitian in charge of the kitchen instruct the dishwasher as to the proper handling of his

machine when there is a 50-percent turnover in her staff every 2 weeks? And when the dishwasher doesn't arrive, how can the nurse give a high standard of care to her ill patient when she has to wash the dishes?

Is the Nurse Prepared for the Tuberculosis Service?

It is clear from the above that to function most effectively in the tuberculosis hospital, a nurse must acquire a detailed and extensive body of knowledge. She can begin to do this as a student in a school of nursing and continue later while actually on the job.

Progress is being made in providing experience in the care of tuberculosis patients as part of basic nursing education. Directors of schools of nursing are recognizing their responsibility in giving students both theoretical instruction and clinical experience in tuberculosis nursing, and affiliation courses within tuberculosis hospitals are gradually being developed.

But there is still a long way to go. In the community study area, for example, none of the three tuberculosis sanatoria offered affiliation programs for student nurses; they were not in a position to do so without considerable improvement in their facilities and nursing service. Four of the general hospitals with schools of nursing did give tuberculosis nursing courses in theory and clinical experience. Interestingly enough, of all the nurses graduated from nursing schools in this area, in the year 1947, 22 percent had received clinical experience in tuberculosis nursing. On the other hand, 50 percent of the graduate professional nurses employed in the tuberculosis services had received clinical experience in tuberculosis nursing in their basic nursing education. This would seem to indicate that a greater proportion of graduate nurses might enter the tuberculosis field if they had received clinical experience in tuberculosis nursing during their basic nursing education experience.

Once employed in the tuberculosis hospital, most nurses are given on-the-job instruction. Their formal orientation, however, should not stop there. Some few institutions do give the in-service class instruction so necessary to the many nurses who lack prior clinical experience. Where this is done, most administrators believe that in the long run it saves time, provides more efficient nursing care, and better equips the individual nurse to practice safe protective measures. Consequently, it affords her more protection while working in a contaminated environment.

Nurses should have access to professional library facilities if they are to add to their knowledge and keep up with current trends in tuberculosis. Yet these library facilities are lacking in many hospitals; in others they are limited or need a great deal of expansion. In most services there is also a need for a more liberal policy toward advanced

educational preparation in tuberculosis nursing, general nursing education, and administration. Our studies have shown that the proportion of nurses qualified in the administrative, teaching, and supervisory fields is much less in tuberculosis than in general hospital services.

Can the Tuberculosis Hospital Compete in the Hospital Labor Market?

Though there are more active nurses in the United States today than there have ever been before, the need for them has been greatly increased by modern developments. These include the tremendous scientific advances made in health fields, the gradual acceptance of the idea that each patient needs the best of care, the expansion of public health services, the increased use of nurses in industry, the spread of medical prepayment plans, the growth in the total population of the Nation, and the fact that a greater proportion of Americans are now in an older age group and are enjoying an all-time high standard of living.

As a result of all these factors, the hospital labor market is extremely competitive. As in its industrial counterpart, the employer who offers the most gets the best. The tuberculosis hospital, as we have seen, certainly needs the best, and yet its personnel policies often lag behind those employed by the general hospitals. This lag serves as still another deterrent to the recruitment of nursing personnel, for the whole community draws from the same pool of professional and nonprofessional nurses. In a defense situation such as that existing at present, the competition for personnel is of course aggravated.

Hours

Very few tuberculosis hospitals have attained the standard of a 40-hour week recommended by the American Nurses Association. Sanatorium nurses work from 44 to 67 hours a week while the average workweek for nurses in general hospitals is about 44 hours. One sanatorium studied, for instance, has two shifts per each 24 hours for its staff. Professional nurses work a 6-day week of about 52½ hours, exclusive of meal times. One day they work from 7 a. m. to 12:30 p. m. and from 6 to 10 p. m.; on alternate days they work from 7 to 10 a. m. and from 12:30 to 6 p. m. The permanent night staff works from 10 p. m. to 7 a. m. It is hard to see how a nurse can be ready to do a thorough job at 7 in the morning when she worked until 10 the night before. In another hospital night nurses work a 60½-hour week with equally irregular hours.

Vacations, Holidays, and Sick Leave

Policies governing vacations, holidays, and sick leave are more or

less uniform—most hospitals give 14 or 15 days of vacation with pay per year. Tuberculosis hospitals do tend to give less holiday time than do general hospitals and allow time off in choppy half-day, rather than full-day periods. Since the tuberculosis nurse works intimately with active cases of tuberculosis she needs rest and relaxation as a preventive measure. It would be a wise health policy to give her not less, but more, vacation, sick leave, and time off than are granted to nurses not in contact with a communicable disease.

Health Services

The health service offered personnel in the tuberculosis services is inadequate in far too many cases. Before a nurse is assigned to duty on a service, she should be given a general physical examination including a chest X-ray, a tuberculin test, and any other tests indicated. A general physical examination and chest X-ray should be repeated for everyone at regular intervals; a tuberculin test should be repeated for nonreactors at stated periodic intervals. Few tuberculosis hospitals, however, give prospective nurses routine preemployment physicals and some do not even give tuberculin tests, though preemployment and periodic X-ray is done almost everywhere.

And nurses, along with other tuberculosis hospital employees, do get tuberculosis. The reported percentage who contract the disease varies greatly, but there are studies which testify to a high rate of disease among physicians and nurses. Nurses, who are usually responsible for setting up protective measures in the services, realize that they are not safe unless all hospital employees are well protected. In the hospitals studied, student nurses generally have the best health services, graduate nurses less, and nonprofessional personnel in nursing, dietary, and housekeeping service often have little or none. At the request of the Council on Tuberculosis Nursing, a Committee of the American Trudeau Society, the medical section of the National Tuberculosis Association, is now considering the hazards involved for personnel working in tuberculosis services. It is expected that it will make recommendations which, if practiced, will better protect personnel.

Salaries

Salaries, too, are low and have not risen in proportion to the cost of living. Tuberculosis hospitals do furnish maintenance, or rooms, meals, and laundry service more often than do general hospitals, but this factor tends to be offset by the longer workweek of the tuberculosis nurse. Most important, in States where tuberculosis is not a legally compensable disease, nurses frankly state that they are more afraid of economic dependency as a result of the disease than of the disease itself. As one nurse put it, "Yes, the hospital would give me medical

and nursing care if I get tuberculosis, but who would feed my mother?"

Theodore C. Waters and Mary Graham Mack, in an article in the December 1950 issue of the American Journal of Nursing (*14*) report that as of October 1, 1950, occupational diseases were compensable under workmen's compensation laws in 40 States, the District of Columbia, Alaska, Hawaii, and Puerto Rico. Twenty-three States consider all occupational diseases compensable and 17 have laws compensating a list of specific diseases. In South Dakota, tuberculosis is included specifically in the list of compensable occupational diseases; in some States it is listed as a complication of silicosis. "In the States which provide compensation for any and all occupational diseases, if the nurse contracting tuberculosis is an 'employee' and the employment is covered by the statutes," say the authors, "it is our opinion that the administrative agency or courts would hold such claims to be compensable under the statutes, although we found reported court decisions in only four States." They add that nurses who seek workmen's compensation for tuberculosis should communicate with the agency in the State government which administers compensation.

Living Quarters

Inadequate, or very plain living quarters, are frequently the rule rather than the exception in tuberculosis services. Furnishings are likely to be poor and floors bare. Or there is not enough storage space, or sufficient light and air. In one hospital there were plenty of shower facilities, but almost half were out of order, and most lacked curtains. Since the quarters a hospital provides a nurse are often her home, every effort should be made to make them comfortable and attractive. Some institutions do succeed in doing this. One, for instance, arranges its living quarters like apartments, so that each four nurses have their own kitchen, bath, living room, and individual bedrooms.

Many hospitals give nurses the choice of living in their own or in hospital quarters. But they give little or no compensation for outside living arrangements and are often situated in such isolated locations that few nurses can live away, although most would prefer to do so. Nursing directors frequently report that the necessity for living in hospital quarters is a deterrent to recruiting and retaining personnel.

Transportation and Recreation

Transportation to hospitals is sometimes difficult and expensive, and nurses usually must bear the cost. Though they prefer, for the most part, to provide their own recreation, the high cost of transportation to places where it is available is also a deterrent to attracting and keeping all hospital personnel. Some institutions do run

buses into nearby cities to furnish transportation for recreational purposes.

Retirement Plans

Retirement plans are of rather recent origin in most tuberculosis hospitals as they are in general hospitals and other health services. Consequently, nurses now reaching retirement age have comparatively low benefits, since they have not participated in plans over a long period of years. Then too, income benefits, as in plans in other fields, are based on a standard too low to cover current living costs. When permitted, nurses must often continue working after retirement age to make a living.

In accordance with new social security laws, hospitals may, if they elect to do so, put their nursing employees under social security regulations. Nurses interested in further details are referred to an article titled "The New Social Security Law and the Nurse," in the November 1950 issue of the American Journal of Nursing (*15*). The authors, William C. Scott and Donald W. Smith discuss the effect of the new law on private duty or employed nurses. They report that it provides a "possibility of coverage" for employees of religious, charitable, educational, and similar institutions hitherto exempt from social security coverage. In order to obtain such coverage, a waiver of exemption must be filed and signed by the employer and at least two-thirds of the employees (non-nurses as well as nurses) of the institution or agency. The employees who sign the waiver and all new employees will then be required to pay the usual taxes and will be eligible for the usual benefits. The new law permits States and municipalities to obtain coverage for their employees by entering into voluntary agreements with the Federal Government. However, employees already covered by an existing retirement system of the State or municipality are not eligible for inclusion.

What Nursing Personnel Does the Tuberculosis Hospital Attract?

Professional

Under all these conditions, then, who, briefly, is the professional nurse the tuberculosis hospital does attract?

She is probably female, white, and single. If she is in a tuberculosis sanatorium she is, on the average, older than her colleague in the general hospital. Also, her educational attainments are lower, partly because general educational requirements for entrance into schools of nursing were lower at the time of her basic professional training. The chances are good that she received theoretical instruction in tuberculosis nursing in her basic nursing course; they are less than even that she

had clinical experience. Her opportunities for advanced preparation in general or in tuberculosis nursing are limited.

She changes jobs frequently, no doubt because of the variety of reasons discussed previously. One hospital reported a turn-over of both professional and nonprofessional personnel of 100 percent in a single year; another reported an 85 percent turn-over. She is likely to have been on the job a comparatively short time, although she does have some few colleagues who hardly ever change jobs. She probably has had no tuberculosis nursing experience as a graduate nurse previous to her present employment, nor any experience in other types of communicable disease nursing.

Nonprofessional

Because of the great need for nurses, the professional nurse's work is necessarily extended by that of the nonprofessional worker. In general, these nonprofessional nursing personnel have longer working hours, fewer days of paid vacation, and less health service than their professional colleagues. They have, as might be expected, less education. Some have received a little nurses' training and have been in schools of nursing and had their course interrupted by contracting tuberculosis.

By and large, the nonprofessional worker under the supervision of professional nurses can make a real contribution to the tuberculosis service. The ratio of professional to nonprofessional workers on the nursing staff should be studied in each particular hospital situation. As a guide: a minimum of one-third professional to two-thirds nonprofessional workers is indicated; most hospitals function more efficiently if a ratio of one-half professional to one-half nonprofessional is used. Often these goals are not attainable because of shortages of both professional and nonprofessional personnel. The interrelation of all these shortages and the effect of each on the total hospital picture needs more study.

The Hospital and the Community

It should be emphasized that the problems relating to the care of the tuberculous patient must be considered as a part of a program extending beyond the hospitals. A community's resources for the care of the tuberculous patient is found not only in its hospitals but in its community organizations, especially agencies which provide clinic and home services. Adequate social and welfare services are also essential to good medical care.

There must be cooperative planning by these agencies if there is to be an effective tuberculosis control program. Only by such planning can the patient and his family have complete and continuous care.

There is a great need for formulating policies and procedures for exchange of information about tuberculosis patients and their families within and between hospitals and agencies. This need extends far beyond nursing, of course, but it surely applies to nursing. When the public health nurse, for instance, can visit the tuberculosis patient in the hospitals, she finds a real means of strengthening her relationships with the patient's family.

Conclusions

Obviously it is not possible to improve tuberculosis services overnight. It will take many years, much effort, and a good deal of money before the tuberculosis hospital's physical facilities can be adequate or its personnel policies and patient care entirely satisfactory.

With imagination and intelligent planning however, the limited resources which are available can be used in such a way that the tuberculosis hospital will become a safer, more attractive place in which to be a worker or a patient. This will require the combined effort of all officials concerned, including those responsible for hospital administration, nursing service, and nursing education.

If these officials work carefully and cooperatively their accomplishments can be real indeed. One institution studied the ratio between its professional and nonprofessional workers. It decided it was in desperate need of professional nurses qualified in tuberculosis nursing and found them in nurses who were housewives willing to return to work on a part-time basis. Another considered staff assignments in detail and concluded that the patients' rest periods offered an ideal time for in-service training of personnel. It used this period for a variety of educational activities which, it turned out, directly improved patient care and bettered staff morale. Other hospitals have made recreational facilities more accessible by running busses or cars into nearby cities.

Even as they make full use of available resources, however, responsible officials must have concrete goals to be considered in planning for the unmet nursing needs of tuberculous patients. We suggest that, in general they strive:

1. To increase nursing services so that patients receive more adequate care through:
   a. The employment of additional professional nursing personnel in a proportion that can best be utilized for the particular hospital involved;
   b. Reevaluation and reassignment of responsiblities of professional and nonprofessional nurses to insure the best utilization of education and skills;
   c. Investigation of turnover of all types of personnel so that the

causes of this turnover may be determined, analyzed and used as an administrative tool in planning remedies.

2. To make physical facilities for care of the tuberculous patient safer, more efficient, and more attractive by establishing planning committees to consider new hospital construction or renovation and improvement of existing facilities. Since nurses have, through their professional education and experience, gained much knowledge which would be of use to these committees, they should be given the opportunity to contribute to them.
3. To give the nurse the chance to practice protective measures in order to provide her and others in the hospital with a safe working environment.
4. To decrease the lag in personnel policies in effect in tuberculosis hospitals as compared to those in general hospitals by:
   a. Improving them to equal or better policies recommended by the American Nurses Association;
   b. Studying total personnel needs and the relative importance of all workers, professional and nonprofessional, to the whole picture;
   c. Expanding and strengthening the health programs for all types of personnel.
5. To enable the nurse to acquire a sound education in tuberculosis nursing by:
   a. Establishing more affiliation courses as a part of the basic nursing program in tuberculosis hospitals;
   b. Continuing and expanding supplemental education and advanced courses in tuberculosis nursing for graduate nurses;
   c. Continuing and expanding organized and planned courses for nonprofessional nursing personnel under professional guidance;
   d. Continuing and expanding vigorous staff education programs in the tuberculosis service.
6. To enable the hospital to consider the over-all care of the patient through:
   a. Aiding hospitals and agencies in cooperative planning on a community-wide basis;
   b. Improving record systems, and planning for free exchange of information between hospitals and community agencies;
   c. Working for community-wide support of legislation which would include tuberculosis as a compensable disease for workers in tuberculosis services.

If administrators, physicians, nurses, and, in fact, all concerned with patient care keep these goals in mind and use some imagination and much ingenuity, tuberculosis hospitals can improve. They can indeed be made into satisfying places in which to work, where pa-

tients are given adequate treatment and are returned to their homes and communities as happy, useful citizens.

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What Is a Reportable Case of Tuberculosis?

The reporting of cases is indispensable to the control of tuberculosis. A health department cannot discharge its responsibilities for the supervision of cases and the examination of contacts if all cases identified in its jurisdiction are not brought promptly to its attention. The case that is reported first on a death certificate represents to the tuberculosis controller a disheartening frustration of his aims.

Furthermore, reliable information about the extent of the problem is necessary for intelligent planning of control programs. In the 30 years of almost universal compulsory reporting of tuberculosis in this country, there has been so little agreement on definitions of reportability or uniformity in reporting practices that available tuberculosis morbidity data have represented only makeshift estimates. Mortality rates have been used as a measure of control needs in spite of growing awareness of their inadequacy for that purpose. In recent years, the rapid decline in the death rate has quite evidently not been accompanied by a commensurate decline in morbidity. As case-finding efforts are carried on with increasing vigor and more cases are discovered in the minimal stage, and as new drugs and other methods of therapy prolong the lives of tuberculosis patients, it is apparent that mortality rates are no longer an accurate current guide to the tuberculosis problem. There is greater need for better reporting of all cases.

To be really useful, moreover, tuberculosis case reporting should conform to commonly accepted standards. Data are of little use if some reflect all cases including suspects, while others show only active cases with positive bacterial findings.

Recognizing that the epidemiology of tuberculosis would continue to be based largely upon presumptions and not upon facts until case reporting was standardized, the Joint Meeting of the State Tuberculosis Control Officers and State Sanatoria Directors in 1949 recommended the appointment of a committee to study the problems of tuberculosis morbidity reporting and to try to work out solutions. Members of the committee appointed by Dr. R. J. Anderson, Chief, Division of Tuberculosis, Public Health Service, represent States in widely separated parts of the country, with various population characteristics and tuberculosis control patterns. They are:

From the Division of Chronic Disease and Tuberculosis.

Dr. C. M. Sharp
Director, Bureau of Tuberculosis,
Florida State Board of Health

Dr. Richard M. Burke
Director, Division of Tuberculosis Control
Oklahoma State Health Department

Dr. Edward X. Mikol
General Director of Tuberculosis Hospitals
Division of Tuberculosis Control
New York State Department of Health

Dr. Edward Kupka
Chief, Tuberculosis Service
California State Department of Public Health

Dr. Cedric Northrop
Head, Tuberculosis Control Section
Washington State Department of Health

Dr. Hilbert Mark [1]
Tuberculosis Control Officer
Division of Preventable Diseases
Minnesota Department of Health

Dr. Paul S. Phelps
Director, Connecticut State Tuberculosis Commission

This committee has met several times in the past 2 years and has considered in detail the ramifications of the assigned subject. They have dealt with exceedingly perplexing questions, and their final report, which was accepted by the joint meeting in May of 1951, is a valuable contribution to tuberculosis control.

The committee was not concerned with criteria for the diagnosis of tuberculosis. These are defined in Diagnostic Standards and Classification of Tuberculosis, published by the National Tuberculosis Association, a new edition of which was issued in 1950. The Committee on Tuberculosis Mobidity Reporting used this publication in its work, but its problem was to define standards for the reporting of cases, not for diagnosis.

The report provides for standards for tuberculosis reporting which are sufficiently flexible to allow for the differing needs and regulations of the various States and, at the same time, furnish comparable data. The recommendations of the committee also provide for some local variation in the selection of reportable cases and in the mechanism of reporting. If they are followed, however, they will yield significant information which has heretofore been lacking.

The tuberculosis control officers and State sanatoria directors, in accepting the committee's recommendations, indicated their interest in improving the status of tuberculosis morbidity reporting. We now have the means to eliminate the confusion which has accompanied tuberculosis case reporting. This is possible only if action is taken by all health jurisdictions to adopt the committee's proposals. The ultimate effectiveness of the committee's work will depend upon general application of their recommendations which are set forth in the following report.

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[1] Served on committee from August 1949 to December 1950. At present Director of the Division of Tuberculosis Control, Denver City Health Department.

Report and Recommendations of the Committee on Tuberculosis Morbidity Reporting, May 14, 1951

I. Purposes of Reporting Tuberculosis Cases

The primary purposes of tuberculosis morbidity reporting are:

A. *For case supervision.* To assure continued medical supervision, isolation, and follow-up of all known cases as long as may be necessary to prevent spread of the disease.

B. *For contact supervision.* To facilitate the examination of contacts of all known cases.

C. *For program management.* To provide information for use in:

1. Determining the extent and characteristics of the tuberculosis problem, and
2. Evaluating the effectiveness of tuberculosis control measures.

II. Medical Criteria for Reporting Tuberculosis Cases

A. *To be reported.* The following cases should be reported:

1. Cases with tubercle bacilli demonstrated.
2. Cases with other significant evidence, even though bacteriological proof has not yet been demonstrated, such as:
   a. Chest X-ray shadows characteristic of active tuberculosis (soft infiltrate, cavity, etc.);
   b. Unexplained pleurisy with effusion;
   c. Clinically active extra-pulmonary tuberculosis (meningeal, bone, kidney, etc.).

B. *May be reported.* The following previously unreported tuberculosis cases may be reported:

1. Cases of pulmonary fibrosis and nodulation more than minimal in extent, presumably of tuberculous origin.
2. Cases with a record of active disease or previous treatment within the past 5 years.
3. Cases with X-ray evidence of collapse therapy or resection for tuberculosis.
4. Active primary pulmonary tuberculosis cases.

C. *Not to be reported.* The presence of the following should not be considered sufficient evidence for reporting:

1. Chest X-ray film revealing fibrous lesions, minimal in extent, without history or symptoms. (This includes fine linear strands; discrete, hard nodules; and apical-pleural scars.)
2. Positive tuberculin reaction only.
3. Pulmonary calcification, including healed primary tuberculosis.
4. Healed extra-pulmonary tuberculosis.

III. Report Forms

A. *Methods of reporting.* The committee makes no specific recommendations as to the type of report form which should be used, except that each case should be reported on an individual form. It recognizes that there are at least four satisfactory methods of reporting:

1. General morbidity report form followed by a special tuberculosis morbidity report form.
2. Special morbidity report form for all cases of tuberculosis.

3. Special morbidity report form for initial use by certain sources of reports such as clinics and tuberculosis hospitals; other sources to use method in 1, above.

4. Combined general morbidity report form with a section for special tuberculosis information.

The committee feels that a general morbidity report without the minimum medical information indicated in C, below, is inadequate.

B. *Minimum identifying information.* Name, address (present and usual, if different); age, sex, and race; source of report; date reported; was case first found on miniature X-ray?

C. *Minimum medical information*

FORM AND EXTENT	ACTIVITY STATUS	BACTERIAL STATUS
Pulmonary	Active*	Positive
Minimal		
Moderately advanced	Activity undetermined	Negative
Far advanced	Probably active*	
Other, specify_____	Probably inactive	Unknown
Nonpulmonary, specify____	Arrested	
	With positive bacteria findings*	
	With negative bacteria findings	
	Inactive	

D. *Optional information.* Occupation; marital status; veteran status; length of State residence; date of last laboratory examination; date of last X-ray examination; if reported after death, date of death. Was diagnosis verified by X-ray, laboratory examination, or autopsy? Method of laboratory examination (direct smear, concentrated smear, culture, animal inoculation). Who is to supervise the case?

IV. Administrative Procedures

A. A newly reported tuberculosis case in any State is one which, in addition to meeting the medical criteria presented above, has never been previously reported to the State.

B. There should be a reasonable amount of screening and querying for the purpose of improving reporting and the comparability of data.

C. Tuberculosis cases are sometimes first reported to health departments by Federal, State, or local agencies or physicians by telephone, letter, or forms other than the official morbidity report (Veterans Administration form, clinic examination reports, death certificates, interstate report notices, etc.). Information on such cases should be entered on the official morbidity report form so that they may be counted as new cases.

D. The following are the recommended procedures for counting cases on an annual basis:

1. A case is counted in the year in which it is reported, provided that the report is received by the State health department by January 31 of the following year. If received after that date, it is counted in the year in which it is received.

2. When follow-up information which reverses the diagnosis or otherwise provides a basis for not counting a case is received during the year the case was reported, or during January of the following year, the case is deleted from the count. However, if such information is received after January 31 no change is made in tabulations of newly reported tuberculosis cases.

E. Active and probably active tuberculosis cases, as defined in section II. A., shall always be tabulated as a group and separately from the cases in the optional categories of section II. B. Tabulations made by stage of disease should also follow this grouping of activity status, as should tabulations for other characteristics such as age, sex, and race. In this way a reasonable degree of comparability between States will be achieved.

*Cases in these classifications shall always be reported. Whether or not cases in the other classifications of activity status are reported will be determined by State policy.

Incidence of Disease

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

Reports From States for Week Ended September 15, 1951

Totals of 48 cases of malaria in civilians and 185 in military establishments were reported for the current week as compared with 55 and 230, respectively, for the previous week.

The total reported cases of poliomyelitis in the Nation decreased from 1,871 last week to 1,797 for the current week. Since the seasonal low week, a cumulative total of 16,121 cases has been reported, compared with 16,238 for the corresponding period in 1950. The cumulative total for the calendar year is 17,333 compared with 17,369 for the 1950 calendar year. The cumulative totals for the current seasonal and calendar years include 17 delayed case reports of poliomyelitis from Virginia for the current week. These delayed reports are excluded from the total for the current week for the Nation.

There was an increase in the number of cases in only two of the nine geographic divisions—the West North Central and the Pacific—as compared with the previous week. The increase was not marked in either group.

The decrease in the total reported cases of poliomyelitis in other areas was slight to moderate.

For the week ended September 8, a number of States reported more than 100 cases each. In New York State, which reported a total of 128 cases, 55 were in New York City, 13 in Essex County, and 11 in Nassau County. Illinois reported 108 cases of which 55 were in Cook County. No other county reported more than 5 cases. Michigan had a total of 120, 47 occurring in Wayne and 22 in Oakland Counties. In Wisconsin, 40 of the 106 cases were in Milwaukee and 13 in LaCrosse Counties. No report has been received on county distribution from Ohio where 102 cases were reported. In California, 53 of the 117 cases reported were in Los Angeles County and 11 in San Francisco.

The cases in Colorado continued to be concentrated in the Denver and Pueblo areas, while in Utah, 38 of the 43 cases reported for the week ended September 8 were in Salt Lake, Utah, and Weber Counties.

Dr. C. C. Kuehn, Louisiana Department of Health, has supplied

information to explain the sudden increase in the number of cases of poliomyelitis from 27 for the week ended September 1 to 100 cases for the following week. A backlog of unreported cases developed because new personnel misunderstood reporting procedures. A diagnostic breakdown on the type of disease (paralytic or nonparalytic) is required and this also provokes a delay in reporting. It was discovered that a military establishment had failed to report cases. The newly reported cases in Louisiana when graphed as to date of onset actually show a decreasing number during the past few weeks.

Dr. R. W. Williams, Area Medical Officer for the Office of Indian Affairs, has reported 3 additional cases of poliomyelitis among the Indians living in the area near Hayward, Wis. A total of 17 cases has occurred in this group, none of them fatal but several exhibiting symptoms necessitating the use of a respirator.

Epidemiological Reports

Food Poisoning

Dr. Malcolm H. Merrill, California Department of Health, reports that 6 cases of food poisoning occurred in a group of 15 persons who drank lemonade. Severe vomiting occurred 10 minutes to several hours after drinking the lemonade which had been prepared and stored

Comparative Data For Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median 1946–50
	Sept. 15, 1951	Sept. 16, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	------	------	------	(1)	(1)	(1)	(1)	46	30	38
Diphtheria (055)	60	97	199	27th	512	754	1,354	2,520	3,882	5,964
Encephalitis, acute infectious (082)	34	24	24	(1)	(1)	(1)	(1)	[2] 744	655	463
Influenza (480–483)	342	339	339	30th	1,982	2,391	2,297	118,037	141,155	130,724
Measles (085)	873	518	518	35th	1,746	1,024	1,030	470,657	289,195	552,938
Meningitis, meningococcal (057.0)	51	46	46	37th	4,022	3,712	3,613	3,061	2,799	2,641
Pneumonia (490–493)	497	662	(3)	(1)	(1)	(1)	(1)	47,848	63,493	(3)
Poliomyelitis, acute (080)	1,797	2,146	1,839	11th	[4] 16,121	16,238	15,672	[4] 17,333	17,369	16,022
Rocky Mountain spotted fever (104)	5	12	12	(1)	(1)	(1)	(1)	283	406	478
Scarlet fever (050) [5]	325	344	433	32d	[6] 1,304	1,401	1,773	[6] 54,690	41,571	58,992
Smallpox (084)	------	------	------	35th	------	------	1	11	26	50
Tularemia (059)	16	17	18	(1)	(1)	(1)	(1)	494	708	731
Typhoid and paratyphoid fever (040, 041) [7]	102	92	108	11th	1,730	1,996	2,260	2,165	2,506	2,745
Whooping cough (056)	1,011	1,889	1,889	39th	[8] 73,305	115,309	98,303	[8] 51,703	93,773	72,285

[1] Not computed.
[2] Deduction: North Carolina, week ended August 18, 1 case.
[3] Data not available.
[4] Addition: Virginia, delayed report, 17 cases—not allocated. Deductions: Mississippi, week ended August 25, 3 cases; North Carolina, week ended August 4, 1 case.
[5] Including cases reported as streptococcal sore throat.
[6] Addition: Minnesota, week ended September 8, 4 cases.
[7] Including cases reported as salmonellosis.
[8] Addition: West Virginia, week ended September 8, 36 cases.

5 hours in a silver plated pitcher. The copper alloy base was exposed in the pitcher. Lemonade similarly prepared in the laboratory yielded 82 parts per million of copper.

Botulism

A delayed report of three cases of botulism has been received from Dr. Giedt. The cases occurred in Grant County late in June 1951. A family of five ate asparagus salad made from home canned asparagus prepared 2 weeks before serving. The mother and a 15-year-old son ate the greatest amounts of the salad; a 4-year-old son ate a small amount, while the father and a daughter ate none. The 4-year-old child became ill soon after eating, with vomiting, but recovered. The mother and older son became increasingly ill with nausea, vomiting, double vision, and dyspnea. Both died. A sample of the asparagus revealed *Clostridium botulinum*, type A.

Reported Cases of Selected Communicable Diseases: United States, Week Ended Sept. 15, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**60**	**34**	**342**	**873**	**51**	**497**	**1,797**
New England			**2**	**109**	**1**	**16**	**54**
Maine			1	11		4	5
New Hampshire				8			4
Vermont				16			
Massachusetts				42	1		26
Rhode Island				11			1
Connecticut			1	21		12	18
Middle Atlantic	**8**	**12**	**4**	**246**	**7**	**60**	**237**
New York	6	11	(1)	164	3		132
New Jersey		1	4	52	1	22	51
Pennsylvania	2			30	3	38	54
East North Central	**3**	**2**	**17**	**207**	**16**	**32**	**447**
Ohio	2			23			80
Indiana		1	16	9	1	3	25
Illinois		1	1	65	7	26	132
Michigan	1			37	6	3	110
Wisconsin				73	2		100
West North Central	**1**	**6**	**3**	**28**	**2**	**51**	**265**
Minnesota		1	1	6	1	15	47
Iowa	1	1		1			21
Missouri				5	1		79
North Dakota			2	9		35	9
South Dakota		4		1			14
Nebraska				2			38
Kansas				4		1	57
South Atlantic	**24**	**2**	**168**	**73**	**8**	**54**	**112**
Delaware					1		
Maryland			1	22		11	11
District of Columbia				6		14	3
Virginia	3		165	19	2	24	14
West Virginia	2			12	1		10
North Carolina	14			3	1		18
South Carolina	3		2	1		1	17
Georgia	2			8	1	4	29
Florida		2		2	2		10
East South Central	**15**	**2**	**3**	**25**	**7**	**73**	**110**
Kentucky	4			6		25	21
Tennessee	1			14	4		34
Alabama	4	1		2	3	13	29
Mississippi	6	1	3	3		35	26
West South Central	**7**	**3**	**39**	**41**	**3**	**152**	**198**
Arkansas		1	20	3		8	25
Louisiana						33	52
Oklahoma	1		19	5	1	10	34
Texas	6	2		33	2	101	87
Mountain	**1**		**86**	**61**		**21**	**180**
Montana	1		9	22			11
Idaho				3			6
Wyoming				2			26
Colorado			2	7		10	67
New Mexico			1	8		3	6
Arizona			74	13		8	11
Utah				6			49
Nevada							4
Pacific	**1**	**7**	**20**	**83**	**7**	**38**	**194**
Washington			12	25		2	22
Oregon			3	15	3	19	14
California	1	7	5	43	4	17	158
Alaska [2]							
Hawaii				28			1

[1] New York City only.

[2] Report from Alaska was not received.

Reported Cases of Selected Communicable Diseases: United States, Week Ended Sept. 15, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

Area	Rocky Mountain spotted fever (104)	Scarlet fever [1] (050)	Smallpox (084)	Tularemia (059)	Typhoid and paratyphoid fever [2] (040, 041)	Whooping cough (056)	Rabies in animals
United States	**5**	**325**		**16**	**102**	**1,011**	**117**
New England		**17**		**1**	**9**	**64**	
Maine		3			3	7	
New Hampshire		1				2	
Vermont						1	
Massachusetts		8		1	3	41	
Rhode Island		2				3	
Connecticut		3			3	10	
Middle Atlantic	**1**	**55**			**16**	**223**	**14**
New York		14			3	81	8
New Jersey		8			3	62	
Pennsylvania	1	33			10	80	6
East North Central		**74**		**2**	**5**	**219**	**12**
Ohio		16			1	39	3
Indiana		8				25	4
Illinois		13		1		35	
Michigan		24			4	79	3
Wisconsin		13		1		41	2
West North Central		**16**		**1**	**10**	**48**	**13**
Minnesota		6				2	7
Iowa		3			8	11	2
Missouri		1			1	14	3
North Dakota		1				5	
South Dakota		3			1	2	
Nebraska							1
Kansas		2		1		14	
South Atlantic	**3**	**46**		**3**	**8**	**116**	**20**
Delaware						1	
Maryland	1	2				3	
District of Columbia		2				4	
Virginia		8			1	51	7
West Virginia		6				25	2
North Carolina	2	13		1	1	10	
South Carolina		1			2		7
Georgia		9		2	4	6	4
Florida		5				16	
East South Central	**1**	**26**		**2**	**15**	**48**	**25**
Kentucky		10			7	21	14
Tennessee	1	11			5	8	4
Alabama		1				4	3
Mississippi		4		2	3	15	4
West South Central		**11**		**4**	**20**	**196**	**32**
Arkansas					1	21	4
Lousiana		1			7	5	
Oklahoma					4	17	3
Texas		10		4	8	153	25
Mountain		**15**		**1**	**7**	**45**	
Montana		1				5	
Idaho		6				4	
Wyoming		1		1	1	3	
Colorado		3			5	22	
New Mexico						7	
Arizona					1	4	
Utah		4					
Nevada							
Pacific		**65**		**2**	**12**	**52**	**1**
Washington		10				8	
Oregon		9				2	
California		46		2	12	42	1
Alaska [3]							
Hawaii							

[1] Including cases reported as streptococcal sore throat.
[2] Including cases reported as salmonellosis.
[3] Report from Alaska was not received.

FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended Sept. 1, 1951

Disease	Total	New found-land	Prince Ed-ward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	10					3	5	1	1		
Chickenpox	140	1		1		10	59	10	7	26	26
Diphtheria	1					1					
Dysentery, bacillary	29					5	2				22
German measles	54			1		14	15	2	4	11	7
Influenza	10			3				1			6
Measles	176	18		10	2	13	27	10	9	53	34
Meningitis, meningococcal	6	1		1		1	1	1		1	
Mumps	116	1		1	1	9	42	11	5	26	20
Poliomyelitis	168			24	1	16	108	1	11	2	5
Scarlet fever	87	1				21	8	28	7	11	11
Tuberculosis (all forms)	149	3		5	18	40	15	17	4	13	34
Typhoid and paratyphoid fever	4					2					2
Venereal diseases:											
Gonorrhea	360	5		1	4	89	46	33	34	45	103
Syphilis	113	3		2	11	52	17	2	16	1	9
Primary	5				1	3			1		
Secondary	7					4	2		1		
Other	101	3		2	10	45	15	2	14	1	9
Whooping cough	208			9		48	79	20	8	23	21

CUBA

Reported Cases of Certain Diseases—4 Weeks Ended Aug. 25, 1951

Disease	Total	Pinar del Rio	Habana		Matanzas	Santa Clara	Camaguey	Oriente
			Habana City	Total				
Cancer	116	4		32	14	24	17	25
Chickenpox	3							3
Diphtheria	10		2	5	3			2
Leprosy	2			2				
Malaria	7							7
Measles	21		11	16	2			3
Poliomyelitis	2							2
Scarlet fever	1		1	1				
Tuberculosis	90	1	4	22	18	29	9	11
Typhoid fever	36	6	6	8	4	7	3	8
Whooping cough	1			1				

JAMAICA

Reported Cases of Certain Diseases—3 Weeks Ended Aug. 25, 1951

Disease	Total	Kingston	Other localities
Chickenpox	4	2	2
Leprosy	1	1	
Poliomyelitis	1		1
Scarlet fever	1		1
Tuberculosis, pulmonary	37	9	28
Typhoid fever	49	1	48
Typhus fever	1	1	

NOTE.—Week ended Aug. 4 not included in above table. No report for that week was received from Jamaica.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently.

Cholera

Burma. For the period August 26–September 1, six cases of cholera were reported in Tavoy.

India (French). For the period August 21–31, a total of 65 cases and 33 deaths from cholera was reported in French India. Included in the total were 63 cases and 32 deaths in Pondicherry dependencies. For the preceding period, August 11–20, a total of 127 cases and 68 deaths was reported in French India. Included in the total were 117 cases and 62 deaths in Pondicherry dependencies.

Plague

Ecuador. For the period July 1–31, a total of 10 cases and 6 deaths from plague was reported in Canar County.

Madagascar. For the period August 1–31, a total of five cases and four deaths from plague was reported in Madagascar. Included in the total were four cases and three deaths in Fianarantsoa and one case and one death in Tamatave. For the preceding period, July 1–31, a total of six cases and six deaths was reported. Included in the total were two cases and two deaths in Fianarantsoa, one case and one death in Tamatave, and three cases and three deaths in Tananarive.

Union of South Africa. For the period August 10–16, a total of four cases and one death from plague was reported in Barkly West District, Cape Province. For the preceding period, August 3–9, a total of one case and one death was reported in the same area.

Smallpox

Ecuador. For the period July 1–31, a total of eight cases and one death from smallpox was reported from Ecuador. Included in the total were two cases in Quito.

Indochina. For the period August 26–September 1, a total of 33 cases of smallpox was reported in Viet-Nam. Included in the total were 3 cases in Haiphong and 30 cases in Hanoi.

Yellow Fever

Costa Rica. For the period August 17–21, a total of five deaths from jungle yellow fever was reported in Costa Rica. Included in the total were the following: Los Angeles one, San Jorge one, and Sardinal one, in Rio Cuarto Sarapiqui Zone, Alajuela Province; Venecia one, in San Carlos County, Alajuela Province; and one death in Siquirres County, Limon Province.

French West Africa. On September 6, one suspected case and one death from yellow fever were reported from Parakou, Dahomey. The suspected case was in a male European who died at Parakou, which is about 320 miles north of Cotonou.

Venezuela. On August 11, one death from jungle yellow fever was reported in Mara de Madera, Bolivar State. The case occurred about 16 miles west of Tumeremo in the jungle area.