



GUIDELINES FOR NURSING IN TUBERCULOSIS CONTROL PROGRAMMES

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1. INTRODUCTION

The purpose of this document is to provide guidelines for the utilization of nursing services in tuberculosis control programmes. These guidelines deal with the need for such services, as well as their planning, organization and implementation. They derive from many years of practical experience in the field, especially in developing countries.

The magnitude of the tuberculosis problem on a global basis can be understood from the following information released by the Tuberculosis unit of the World Health Organization:¹ an estimated 15 million people suffer from infectious tuberculosis in the world today, and more than three million die annually. Approximately two to three million new cases occur each year, and in less developed countries special surveys have revealed that one person in every hundred may suffer from infectious tuberculosis. Therefore, the management of such an important health and social matter imposes a duty not only on governments but on citizens as well. In this context the contribution of voluntary agencies should not be underestimated, since many countries attribute their success in tuberculosis control programmes to the activities of these groups.

A tuberculosis control programme in its broadest sense has three main functions: prevention, case-finding and treatment, and must be seen in its total relation to other health services, both preventive and curative. More specifically, epidemiological and demographic factors, such as birth-rates, mortality rates in general, tuberculosis prevalence, as well as morbidity and mortality rates will influence the type of programme to be adopted. The main consideration, of course, will be the availability of resources in terms of both funds and personnel.

Recent trends in public health administration subscribe to the policy that tuberculosis control should form an integral part of general health services, a government responsibility in most countries. The structure of these services may vary, but generally they are administered at three levels - central, intermediate and peripheral. At central level the health ministry may co-ordinate its activities with those of other ministries - agriculture, education, social welfare, etc., but it should assume responsibility for the total health programme of the country, providing health services for vulnerable groups of the population. These services should be incorporated into the total health structure and must function on a permanent and continuous basis. The central level should also set standards for hospital administration and hospital care and for medical and nursing education. Programme planning and policy making are primarily the responsibility of the central level, while programme implementation will be delegated to the next levels of administration. Nursing personnel will participate at all levels of administration and in all aspects of health service programmes - planning, implementation, supervision and evaluation.

Because the implementation of nursing programmes in tuberculosis will be carried out by nursing personnel at the peripheral level, particularly by auxiliaries who will need close supervision, the greater part of this guide relates to the work of personnel at that level.

2. HISTORY OF TUBERCULOSIS CONTROL

2.1 General

Tuberculosis was prevalent and recognized from very early times, as was demonstrated by the evidence of healed bone lesions in mummies found in tombs of the early Egyptians. Through the centuries it was constantly referred to in the writings of learned men.

¹ World Health, March 1964.

With the industrialization of Europe, beginning about the last quarter of the Eighteenth Century, the prevalence of tuberculosis was noted to increase. Generally the victims were found among the under-privileged, who, because of overcrowding, long hours of work, poor working conditions, low wages and impaired nutrition, were easy victims of the disease.

Scientific research on the nature of tuberculosis began in the Seventeenth Century, when tubercles, tuberculous cavities and tuberculous lymph nodes were first described. In succeeding years, numerous workers in many countries added to the rapidly growing knowledge of pathology, and in 1872 Robert Koch isolated the organism that caused the disease, calling it the tubercle bacillus. Tuberculosis was identified as an infectious disease, more specifically an airborne disease, capable of being transmitted from one person to another by the inhalation of cough particles emanating from an infected person.

2.2 Tuberculosis hospitals and sanatoria

This scientific knowledge led to the idea of isolation and the establishment of special hospitals or sanatoria where infectious people were detained, often for very long periods. These institutions were usually situated in the country or in mountainous areas, since mountain air was considered beneficial to the patient and even necessary for his recovery.

Treatment consisted of prolonged bed rest, an abundant diet, fresh air, and the relief of symptoms, usually coughing and chest pain. Criteria for improvement were the reduced evidence of symptoms, gain in body weight, and maintenance of normal body temperature. The deciding factor in recovery was, and still is, the absence of the tubercle bacillus in the sputum of the patient, at which stage he was encouraged to begin exercises, increasing them gradually until full activities were possible.

From about the early 1920s onward, the use of X-ray became increasingly popular, not only as an aid in diagnosis but also as a tool for measuring the progression or regression of the disease. Other forms of treatment were tried, including collapse therapy, which was designed to rest the affected part of the lung by the introduction of air, under regulated pressure, into the pleural cavity and sometimes into the abdominal cavity at a site nearest the affected part. This therapy had certain drawbacks, one of which was the formation of fluid in the pleural cavity, generally because of long-standing adhesions of the pleura.

Artificial pneumothorax (or peritoneum), as this therapy was called, was the first instance of a surgical procedure being performed in sanatoria. It was a protracted therapy inasmuch as the refill had to be repeated at regular intervals, perhaps twice a week, and continued for varying periods - sometimes for two years or more, according to the progress made by the patient. A singular advantage was that it could be carried out on an ambulatory basis after the initial phase of treatment and observation.

Later on, chest surgery was introduced but performed only on specially selected patients, many of whom had been treatment failures when given collapse therapy. Thoracoplasty, extra-pleural pneumothorax, and resection of the whole lung or a part of it require the surgical services of large hospitals or of specialized hospitals. Many countries continue to maintain a number of beds specifically for tuberculosis patients of all categories, especially for those in the initial stages of treatment, for emergencies, for surgery, and for research purposes.

2.3 Tuberculosis dispensaries

When patients were discharged from sanatoria or chest hospitals, their clinical supervision became the responsibility of different agencies according to the services available in their place of residence. Sometimes responsibility would fall to the family physician, at other times to the out-patient department of a district or other hospital. In centres of greater population, specialized out-patient clinics or tuberculosis dispensaries were often established to provide clinical and follow-up service, sometimes with a limited amount of home supervision. A

recognized institution of this kind, established in Edinburgh at the end of the last century, provided a social service as one of its functions. Generally these clinics did not extend their activities much beyond the urban areas. This meant that people in rural areas had little opportunity to benefit from their services.

Under surveillance at these institutions were the following categories of population: those seeking diagnosis, whether referred by another doctor or reporting voluntarily; patients who had been treated in a sanatorium or chest hospital; families of patients; certain "high risk" groups, such as nurses and other exposed personnel. The staff of these institutions often offered supervision in such matters as the principles of isolation and the value of good nutrition. They often co-operated with members of other agencies, public and voluntary, who were administering social services.

In recent years, the structure of tuberculosis programmes has been changed and the quality of the service enhanced by two important innovations: the large-scale availability of a reliable vaccination, BCG, and the discovery of specific antituberculosis drugs, which made possible self-administered ambulatory treatment.

2.4 BCG vaccination

Ever since the infectious nature of tuberculosis was recognized, the discovery of a reliable protective vaccine was envisaged as the greatest preventive measure that could be hoped for. Until the time of that discovery, isolation from the source case was the only known preventive measure and, too often, this took place after rather than before the disease was transmitted. Calmette and Guérin, after years of experimenting during the early part of this century, produced an attenuated bacillus - Bacillus Calmette Guérin - capable of protecting the non-infected from becoming infected. The degree of protection offered by BCG has now been shown to be up to 80 per cent.

Like that of other scientific discoveries, the acceptance of BCG vaccine was not immediate, and an unfortunate incident in 1930 detracted from its belated popularity. However, its value could not be disputed, as was later proved. Conditions following World War II revealed a deterioration in the tuberculosis situation in European countries. Health planners at that time approached the problem by organizing BCG vaccination on a mass scale. Soon afterwards, developing countries became aware of their tuberculosis problems and followed the mass-campaign pattern of BCG vaccination as the initial phase of tuberculosis control. For this purpose, personnel were recruited from different ranks and given short training courses in the specific procedures of tuberculin testing and reading and in BCG vaccination. A more recent trend is the integration not only of BCG vaccination but of all tuberculosis control functions into the basic health services.

Techniques used in tuberculin testing and in BCG vaccination and assessment have been standardized by the World Health Organization's Tuberculosis unit in Geneva and are described in its technical guides.¹ Recent research has shown the possibility of administering BCG directly without prior tuberculin testing and simultaneously with other vaccines, notably smallpox vaccine.

2.5 Chemotherapy

The discovery of specific antituberculosis drugs heralded a new era in the field of tuberculosis. From 1945 onwards several of these drugs were released for general use. The most widely prescribed are Isoniazid (I.N.H.), Thioacetazone (TbI), Streptomycin, and Para Aminosalicyclic Acid (P.A.S.). Isoniazid has the virtue of being the most potent, the

¹ See Bibliography.

cheapest, and the least toxic of the group. With the exception of Streptomycin, which is administered hypodermically, all are prepared in oral forms suitable for ambulatory chemotherapy. Those drugs are known as "first line" drugs and are used in a variety of combinations, generally with Isoniazid forming the basic component. "Second line" drugs, which are active against bacilli resistant to the former, are also available. However, because of their price and toxicity, they are not generally used in mass-therapy programmes, their use being restricted to conditions where very close medical and nursing supervision can be given.

Several well controlled studies on the relative merits of ambulatory chemotherapy and hospital therapy have been carried out in different countries. The findings are very similar and show that patients having ambulatory therapy recover as quickly as do those in the hospital group, in spite of the poorer diet, overcrowding, and lack of rest. Moreover, they show that family contacts of the group treated at home do not manifest a greater likelihood of developing active tuberculosis than do the contacts of hospitalized patients, an indication that the drugs effect virtual chemical isolation.

This information proved that ambulatory chemotherapy was possible and would replace, in a vast majority of cases, the former regimen of long hospitalization and its attendant domestic, economic, and psychological problems. Such an advancement had other implications, e.g., for the first time in many countries the possibility of rural coverage had become a reality. Since the population of most developing countries is largely rural (India 80 per cent.), administrators are now planning their health services with the aim of completely covering rural areas. This is being achieved by the development of comprehensive programmes through peripheral health centres, whereby the emphasis is shifted from hospital to community care.

2.6 Changing role of the nurse from hospital to community care

The advent of sanatoria and the recognition of the value of prolonged bed rest created a demand for high standards of nursing in tuberculosis. These related to the quality of bedside nursing care, the principles of isolation, and the health education of the patient, all of which required the more refined nursing skills usually needed in the care of general medical and general surgical patients.

The practice of collapse therapy further increased the functions of the nurse. These included: the preparation of necessary equipment - with strict adherence to aseptic techniques; assistance to the physician during the actual procedure; and the close observation of the patient afterwards.

For patients who failed to respond to collapse therapy, the introduction of surgical measures called for exacting post-operative nursing care even up to the stage of rehabilitation. The traumatic nature of patient reaction to such surgery required great skill in observation and in the giving of nursing comfort and support.

As the care of patients was gradually transferred from sanatoria and chest hospitals to out-patient departments, nurses had additional responsibilities for co-ordinating the transfer of patients, for giving home supervision where a home-visiting service was established, and for co-operating with other agencies giving material aid. They were also responsible for the care of records, charts, X-ray films, laboratory reports, etc., relating to patients having tuberculosis.

The introduction of BCG vaccination into the functions of a clinic increased the activities of nurses to include tuberculin testing and reading and the administering of the vaccine. As a part of these larger functions, nurses participated in the establishment of standard techniques in tuberculin testing and reading and in the giving of BCG vaccines.

The discovery of specific antituberculosis drugs revolutionized the management of tuberculosis programmes. Because this meant that a majority of patients would undergo ambulatory treatment, fewer nurses were required for giving hospital care. As a result, nursing in the community, thereafter, was on a broader basis, with nurses participating in all control measures: informing the community of newer concepts of tuberculosis control; assisting the physician in case-finding; home supervision; and the recording of data for planning and evaluation.

While the foregoing changes were evolving at the peripheral level of nursing in tuberculosis programmes, the central administrative level was also experiencing an evolution. Whereas, formerly, the nurse at this level was chiefly responsible for the administration of hospital nursing services, she now assumes functions in programme planning, including the planning of staffing patterns, the preparation of nursing personnel, and their supervision. Such planning entails close co-operation with other health personnel at the top level and greater co-ordination of activities among the three (central, intermediate, and peripheral) levels of nursing personnel.

3. FUNCTIONS OF NURSES AT DIFFERENT LEVELS

3.1 At the peripheral level

The peripheral health centre is a permanent establishment within easy reach of the population it serves, and it is equipped to serve that population both at the centre and in the home. One of the functions of the peripheral health centre is the detection, treatment, and prevention of common diseases, especially communicable diseases including tuberculosis. The unit is staffed by a team of professional and/or auxiliary health workers consisting of: a physician or medical assistant; one or more professional or auxiliary nurse-midwives or, where these do not exist, of professional or auxiliary nurses or auxiliary midwives; one or more sanitarians; and supporting staff as required. In most developing countries the nursing work will most likely be carried out by nurse auxiliaries under the administrative supervision of the doctor and the technical supervision of the nurse.

In the control of tuberculosis, the nurse or her substitute will participate actively: in the prevention of the disease through BCG vaccination; in case-finding; and in the treatment of patients with infectious pulmonary tuberculosis - through chemoprophylaxis where economically feasible.

3.1.1 In prevention

The nurse is responsible for informing the population in her area about the preventive services available, emphasis being given to the importance of vaccination, BCG among others. Information can be given during home visits made by the nurse for any purpose, during the time patients attend general clinics, especially in sub-centres where contacts are few, during the nurse's visits to schools, at civic gatherings, at mothers' club meetings and those of parents and teachers, etc. Other agencies and personnel engaged in health activities, both government and private, such as maternity hospitals, pre-natal and post-natal clinics, and private doctors, should be informed by the nurse of all preventive measures offered at the peripheral level and should be encouraged to participate in all preventive measures offered at that level.

Those groups eligible for vaccination will be decided at a higher governmental level. Target groups are likely to include infants, schoolchildren, close family contacts of known tuberculous patients, and any children referred from other agencies. Government policy will determine whether or not the vaccination will be preceded by a tuberculin test. As an integral part of the general health service, BCG vaccination will be performed at regular intervals - once a year in schools, once a month or once in two months for infants - but a regular schedule will be maintained in order to obviate confusion among the public.

Where school populations form part of the eligible group, health and education authorities at a higher level should reach an agreement allowing vaccinations to be performed in the schools. Early in the school year the nurse should visit all schools in her area and discuss the forthcoming vaccination programme with the teachers and with the school health service if it exists. With their permission she should record the names and ages of all children to be vaccinated, together with the teacher's name and class sub-division, on the special form to be used on the day of testing and vaccination. This function will generally be performed once during the school year.

Some time before the date of vaccination the nurse should again meet with school personnel to discuss details, planning her work, as far as possible, to suit the school's activities.

Based on the approximate number of people to be vaccinated, a requisition for the necessary biologicals will be prepared by the nurse and submitted to her senior officer, who will facilitate the order, always allowing enough time for its preparation and delivery prior to the date of vaccination. The nurse and other staff members will then remind the public of the date, time, and place of vaccination. The day before that date, the nurse will check equipment, i.e., the refrigerator, syringes, needles, sterilizers, spirit lamps, and shields, assuring at the same time that sufficient stocks of cotton, alcohol, and record forms and cards are available.

On the day of testing and/or vaccination, the nurse should inspect the biologicals to be used, noting their name, volume, dose and date of manufacture. She should assemble all equipment, including an ice-containing thermos for holding the biologicals, and the "master list" or the cards used for recording. (A sample of the record card appears in WHO/TB/Technical Guide/4.65.)

An auxiliary worker or a volunteer, after being instructed by the nurse as to how to complete the lists, may help with the recording. (In school programmes the class teacher or student teacher may offer this service.) When the vaccinees arrive, their name and age are checked against the master list, after which the nurse inspects the skin of both upper arms to determine the presence or absence of former BCG scars, remembering that the absence as well as the presence of old scars are to be recorded on the list. She then tests or vaccinates, a function that is not recorded until after it is performed. The procedure is so simple and quick that mothers are not alarmed; on the contrary they feel like active participants. When tuberculin testing is being carried out, the mother is given an appointment to bring the child back for reading, the reasons for this and the value of vaccination being explained to her. Clinics provide an excellent opportunity for such health teaching.

When procedures are finished, the nurse collects the lists and cards and checks them for completeness of data, noting date, totals, etc. All procedures are recorded as soon as the function is performed and not at the end of the day or the end of the week. The value of records lies in their accuracy and in the regularity with which they are submitted for evaluation. Most agencies request a monthly performance record to be completed and submitted punctually. Few narrative reports are requested at the peripheral level, but if the nurse makes an observation she should comment on it in her report. Perhaps she noted an unusual frequency of skin disorders among those attending the clinic, or a high percentage of children having positive tuberculin reactions. All of these points are useful in an assessment of the quality of the health service.

When the recording is completed, the nurse collects all equipment, washes, tests, boils and dries syringes, needles and forceps, and stores them separately in special containers for further use. Equipment used for tuberculin testing must be kept separate from that used for BCG vaccination. All opened phials of materials must be destroyed, preferably by burning.

3.1.2 In case-finding

Success can be expected only when the reservoirs of infection are found and treated effectively. The nurse's close association with the public provides her with a good opportunity to contribute to this very important function in tuberculosis control. She cultivates an awareness as to the manifestation of symptoms, i.e., a cough of more than two weeks' duration, chest pain, fever, and haemoptysis, and learns when and where to apply her knowledge.

Some people come to general clinics voluntarily because they are motivated by their symptoms to seek relief, while others accept a chronic cough, even of long duration, as part of their daily life. Such people often attend clinics to seek relief for other complaints, at which time the cough is noted by the staff of the clinic. It is among this group that the nurse will be most active. Opportunities for further observation will be provided during home visits, when there is time for dialogue between nurse and family, at pre-natal and post-natal clinics, during group vaccinations, in fact, at any time throughout the course of the nurse's daily activities.

When a person manifests symptoms of tuberculosis, it is the nurse's responsibility to refer him for investigation to the nearest centre offering facilities. If the peripheral health unit has a microscope and someone trained to use it, the investigation should begin there. If there is no microscope, a sputum specimen can be taken and sent to the nearest centre having a microscope. Where slides are provided at the peripheral health service, the procedure is facilitated, since the slide or group of slides can be prepared and sent on at any time, the sending of a fresh specimen being unnecessary. This is especially convenient in tropical climates.

Generally, people are more co-operative when left in familiar surroundings. Moreover, a service given locally provides the patient with personal advantages: he does not lose work-time; he is spared the cost of transport; and his movements do not become a matter for discussion among his neighbours.

The number of patients discovered in any given area will largely depend on the amount and quality of case-finding. If the case-finding programme has been active and effective, naturally more patients will be found and put under treatment. Thus, the case-load of a nurse in one area may be greater than that of one in a similar area. Where this is so, efforts should be made to determine the cause of the discrepancy.

3.1.3 In ambulatory chemotherapy

3.1.3.1 Registration and referral: When a person is diagnosed tuberculous, his name and other details are recorded on a clinical-treatment card like the one described in WHO/TB/Technical Guide/4.65. A Tuberculosis Register or Case Index is generally maintained at the next level of health authority. Treatment may be undertaken by the peripheral unit, by another agency, or by a private physician, or the patient may be hospitalized. Whatever the situation, the patient remains the responsibility of the place where he has been registered until an assurance is given that he has:

- (a) recovered - this being supported by bacteriological and X-ray evidence;
- (b) died - with cause of death, tuberculosis or other, being noted;
- (c) moved - to an area beyond the supervision of that particular health authority, every effort being made to trace him, especially if he is infectious;

(d) been lost despite several attempts to trace him;

(e) been hospitalized, the date of his admission being communicated to the nearest health authority (Tuberculosis Register) concerned so that time will not be spent in checking his whereabouts. When a patient is discharged, information to this effect should also be referred to the health authority, so that the patient may be followed up and encouraged to continue treatment. (This exchange of information may often involve the physical transfer of the patient's Clinical-treatment Card, always in that case, through the Tuberculosis Register's office.)

An inter-province and/or inter-state referral system will be co-ordinated at the highest level. This system provides the most reliable statistical and epidemiological information and also (and mainly) the best service to the patient.

3.1.3.2 Priorities for the selection of those to be treated will be determined at the highest level according to the resources available in terms of funds for drugs and of personnel for the supervision of ambulatory treatment. In developing countries having higher rates of tuberculosis prevalence, emphasis will be placed on the search for infectious people and on their treatment. Thus, the first priority for treatment will be all "open" cases excreting the tubercle bacillus, while the second will be those persons who are shown by X-ray diagnosis as having advanced and moderately advanced cavitory disease but in whom the tubercle bacillus is not demonstrated. The latter group is a potentially dangerous one and is very worthy of attention. The less-active categories will be considered only after the first two have been dealt with.

3.1.3.3 The initial interview between patient and doctor and patient and nurse is very important, since the success or failure of subsequent treatment may well depend on the quality of this meeting. The object of the initial interview is to motivate the patient to co-operate with the health service. Consideration must be given to the emotional reaction of a person who learns for the first time that he is tuberculous. If he is the earning member of the family his immediate concern will not be for himself but for his dependants. Thus, his primary concern will not be health, but the sustenance of himself and his dependants. Since, physically, he will not feel any different on the day of diagnosis from what he felt the day before, he may be unable at the time to grasp the significance of his new situation and may not, therefore, be receptive to advice. For this reason it becomes very necessary that the nurse approach the subject with sympathy and understanding and encourage the patient.

Privacy is another important factor relating to the initial interview, since most patients are sensitive to having a neighbour learn about their personal affairs. Interviews that take place "under the mango tree", so to speak, are hardly conducive to privacy.

During the initial visit the patient will be given either a supply of drugs enough for one month or a prescription to purchase his own drugs. Once drug therapy has been prescribed, the management of the patient and that of his family becomes the responsibility of the nurse in the area where the patient lives.

3.1.3.4 The initial home visit, if feasible, should take place as soon as possible after the patient has been diagnosed, since this is the time when both he and his family are looking for the nurse to help guide and encourage them in facing their new problems and when they are most sensitive to guidance.

The approach to the home should be cordial and tactful. When the nurse has identified herself and stated briefly the purpose of her visit, the conversation should be led by the head of the household. Health and social workers would do well to remember that they are guests in the home, a situation quite the reverse of that existing when the patient visits a clinic or hospital.

During the home visit, the chief function of the nurse is the motivation of the patient to take his specific drugs regularly over the prescribed period - usually not less than one year. The family should be included in this dialogue so that they can better understand the reasons for continuous medication and for other measures and can help the patient by encouraging and reminding him of his duty. It is hoped, therefore, that the initial home visit will be a preventive measure, not a corrective one like the home visit made after a patient fails to collect his drugs.

All information given by the nurse should be given with confidence and enthusiasm, and always with an optimistic prediction of the patient's recovery. Newer concepts of tuberculosis control must be explained, especially with regard to activities permitted to the patient. Only in very extreme cases would bed rest be recommended. If a patient feels well enough to continue his work, he should be encouraged to do so in order to obviate the socio-economic problems that would arise as a result of his inability to keep his place in his family, at his work, and in the community.

According to modern concepts of treatment, the need for isolation is not stressed because antituberculosis drugs, when taken regularly, will reduce the degree of infection in the sputum. However, certain normal precautions continue to be advisable, and the patient should be instructed to dispose of his sputum in a practical way - by burning it in paper or in some dry leaves. The habit of indiscriminate coughing and spitting, whether by tuberculous persons or others, should be discouraged.

The nurse should assess the family's resources so that she can make recommendations that conform with the family's ability to fulfil them. If a separate bed is available, for example, the patient should be encouraged to use it. Other information given by the nurse could include some advice on nutrition, always aimed at the best use of available resources. If the situation warrants it, some instruction could be given on personal and environmental hygiene, both general and specific. No more information should be released to the patient and his family than they can assimilate. In no case should marginal information or health education distract the patient from the central object of motivation, namely, the regularity of drug taking.

Supervision of family members may start with an inquiry as to whether other persons in the house or the extended family have symptoms suggestive of tuberculosis. If so, the nurse should refer them to the nearest centre, where diagnosis can be started. Children having no evidence of BCG vaccination should be given an appointment for a tuberculin test, and those eligible should be given BCG vaccination.

The purpose of a home visit is to give help and advice to the family regardless of the primary reason for the nurse's visit. Interest in tuberculosis should not be limited to instances where the home visit is made on account of a tuberculosis patient. If, for example, a nurse makes a visit for pre-natal supervision and finds in the same house an old man with persistent cough, she should certainly refer that man for investigation at the nearest centre. A service where the total health programme is administered by one agency at peripheral level should have special appeal because it is comprehensive and time-saving and allows for the development of a closer patient, family, and staff relationship.

3.1.3.5 Follow-up of the patient at the health centre, out-patient department, or dispensary is extremely important, since prolonged and continuous treatment is necessary for his recovery.

Nursing follow-up begins one month after diagnosis, by which time the patient will have consumed the month's supply of drugs given at the time of diagnosis. Treatment surveillance based on an appointment system is described in WHO/TB/Technical Guide/4.65. Also described are the recording procedures applicable in tuberculosis control programmes.

When patients call at health centres or treatment centres to collect their drugs, they must be treated with courtesy. The nurse may begin by asking the patient how he feels, whether he has taken his medicine and, if not, why not, etc., and refer him to the doctor if required. She might inquire as to the welfare of other family members, expressing her concern if anyone is not well and giving appropriate advice. Before the patient leaves, the nurse will hand him his next consignment of drugs, writing the date of his next attendance on his appointment card and on his treatment card. If patients co-operate in drug collection, the need for further home-visiting for this purpose is minimized and the clinical results improve.

Clinical follow-up takes place when the patient has consumed the specific drugs for prescribed periods - usually six months and one year - at which time the physician will want the patient to report for clinical re-examination, possibly with a view to checking the effectiveness of the treatment. The nurse will assist the doctor at this interview, making certain that the patient fully understands the instructions given.

The amount and type of clinical follow-up will depend on available facilities. For patients initially having bacilli in their sputum, a very effective means of assessing their progress is the periodic examination of sputum by direct microscopy. For patients initially not having bacilli in their sputum, a static X-ray unit may be serving the area or a mobile chest unit may periodically visit the health centres. If so, the nurse may arrange for effective referral, indicating the day, hour and place of the forthcoming visit.

3.1.3.6 Default as to drug intake must be seriously studied and dealt with. Experience has shown that patients fail to collect and consume their drugs for a variety of reasons, many of which might be overcome if patients are properly motivated at the outset. Following are some of these reasons which the nurse might examine more carefully: the patient simply forgot; he was working and there was nobody dependable at home to send to the clinic for the drugs; he did not like the neighbours to know he was under treatment for tuberculosis; if the patient was a girl, she felt her chances of marriage were reduced; the patient did not think his treatment was important because he did not really feel ill; after some weeks or months of treatment he felt so much better that he decided no treatment was necessary - in fact, either he is much better and should be encouraged to complete the prescribed course of drug therapy or he is worse and needs the treatment even more; in some developing countries people are of the opinion that, because the medicine is free or inexpensive, it will not be so effective as a drug with a trade name (which very often contains less of the specific component that is necessary for their daily requirement); the supply of drugs was exhausted when the patient went to the centre, a factor which discouraged him from returning.

Some of these reasons may be due to the brevity or poor quality of the first interview or to operational factors. In mass case-finding, for example, especially during the initial campaign, so many new patients may be discovered over a short space of time that it may not be possible to give enough time to each patient.

The depletion of drug supplies is one of the principal reasons for drug default and contributes most to the patient's lack of confidence. At the same time it can be one of the most easily controlled reasons. Health centres should order and issue a supply of drugs adequate for the entire cure of each patient.

The nurse will know from the drug collection data, which she checks monthly or more often, how many patients are co-operating. Thus she really has to follow only the defaulters. Further home visits may be undertaken for this purpose. They should be centred on the cause of default and on the suggestion of remedies. That the patient has absconded is an indication that he is vulnerable physically, emotionally, or intellectually. The nurse must make a particular effort to create a sympathetic interview situation, if possible with the other members of the household, so that she may elicit gently the reasons for the patient's non-cooperation and obtain suggestions for remedial action.

3.1.3.7 Drug resistance is also an important factor in treatment and is the main reason why drug intake should be continuous and uninterrupted. Drug resistance rarely is the cause of treatment failure. More often is it the result of it, that is, of irregular or discontinued treatment. Drug resistance is suspected when bacilli persist in the sputum after 4-6 months of chemotherapy.

A "spot check" examination of the urine is sometimes made to determine whether or not the patient is consuming his drugs. Simple "dip and read" paper strip tests have been developed for this purpose. In some places the "intermittent" regimen of therapy is used - the patient attends the health centre once or twice a week and consumes his total drug intake on the spot under the nurse's supervision. These are methods whereby irregularity of treatment and, in turn, drug resistance are avoided.

3.2 At the intermediate level

At the intermediate level the nurse's responsibilities are usually two-fold, general administration and supervision. In communities of larger populations, these functions may be divided between two nurses, a senior nurse supervisor and a field nurse supervisor. The senior nurse is responsible for a larger geographical area and provides the link between the highest administrative level and the lower levels, while the field nurse supervisor forms the link between the senior nurse supervisor and those workers at the peripheral level. In many countries, however, the administrative and supervisory nursing responsibilities for a particular geographical area are undertaken by a single nurse, who reports directly to the nurse at the highest level. Her place of duty is generally in a provincial town or other centre of greater population within reasonable distance of her area of responsibility.

3.2.1 General administrative responsibilities: The nurse at intermediate level functions under the general direction of the official medical officer and under the technical direction of the chief nurse at the central level. Her responsibilities are as follows:

- She should inform her seniors as to the current position of public health matters, including tuberculosis, in the area under her supervision. In this context she would submit consolidated reports on specific accomplishments. As regards tuberculosis, these might include: the number of persons tuberculin tested and BCG vaccinated, the number of new tuberculous patients registered in the previous quarter, the number of patients under treatment, the number treated effectively during the previous one-year period, and so on. With this information, an evaluation of the programme can be made and further goals or a reshaping of the programme may be considered.
- She should submit to her seniors all information and proposals regarding such matters as the recruitment, selection, and assignment of nursing personnel, the delegation of duties, the orientation of new personnel, in-service education, budget allocation, supplies, and so forth. Proposals for changes and improvements should be supported with factual evidence attesting the need for such changes.
- She should assist in the identification of influential individuals and groups within communities whose understanding and support are essential to the success of the health programme.
- She should participate in the planning and assessment of local health programmes and notably in the integration of these programmes, including the tuberculosis programme. In this context, she must help the medical officer to have a clear understanding of the capabilities of public health nursing personnel, so that responsibilities commensurate with capabilities can be delegated.

3.2.2 Supervisory responsibilities: Supervision, in the context of a health programme, is a process whereby a designated individual (a supervisor) helps to improve the work of a service through the continuous development of workers and through the improvement of conditions under which the work is carried out. The approach to supervision must be positive, that is, rather than merely following a pattern of rules, regulations, inspections, rewards and punishment, the supervisor will encourage workers as to self-evaluation and decision-making in relation to the declared objectives of the service and according to the means available for their attainment.

It is very important that workers at operational level be kept informed of all changes in policy emanating from higher levels. The supervisor is responsible for interpreting such changes and guiding operational personnel in implementing them.

In promoting the effectiveness of the worker and, in turn, of the health unit, the supervisor, with the help of the worker where possible, will evaluate the work performance, diagnose the cause of difficulties, assess the reservoir of unrealized potential, and develop and implement alternative procedures whereby performance may be improved to the satisfaction of the worker and the betterment of the health unit. In carrying out this work, the supervisor might find the following suggestions helpful:

- An understanding of the worker's situation, both professional and personal, is important. If the worker comes from a centre of greater population and finds life in a rural setting a new experience, she may have difficulty in adjusting. Facilities for recreation will be fewer and problems of accommodation greater. It is possible that these factors will be reflected in the quality of her work. For this reason, a supervisor should be aware of such factors, recognize their significance, and help to ameliorate the situation.
- A visit from the supervisor may be welcomed by staff of the peripheral unit as an opportunity to discuss means whereby a better service might be given to people, the first aim of any programme. The number of visits to individual peripheral units will depend on the allocation of funds for supervisory services and on the communications and transport available for the area to be covered. In this context, the size of the area, its geographical location, and its population distribution are important factors to be considered in drawing up a schedule of visits. Every effort should be made to reach the less accessible units as frequently as the others since workers in these units generally need the support and guidance of their supervisor.
- Before setting out on tour the supervisor should read those reports submitted from the area to be visited and note any points of special interest and any changes since the previous visit. With regard to tuberculosis control, the supervisor should review all records relating to achievement in the three basic functions - prevention, case-finding and treatment - and discuss the results not only with the nurse but with other staff members involved, inviting suggestions from them for improved methods where indicated. At the same time, the nurse supervisor should offer her own solutions to the problems.
- By studying the reports and discussing them with workers, the supervisor can have some idea of the quality of the work. For instance, the coverage of one-year olds would reflect the worker's imagination and drive, while the distribution of tuberculin reactions subsequent to BCG vaccination would indicate the quality of the vaccination. Where established standards are not attained, two matters will require investigation, namely, the quality of the vaccine and the technique of administering the injection.

- The supervisor might also discuss the planning of the nurse's day-to-day activities, assessing not only the time spent on tuberculosis functions in relation to their yield and to other work but also the priority of selection used by the nurse for home-visiting. Where it appears that time is not being utilized to the optimum effect, the supervisor might encourage discussion as to how to improve the situation. Perhaps the most fruitful investment would be discussions related to the solution of actual case-problems. These would improve the imagination of workers and help them to avoid making pious and abstract recommendations.
- The stocks of supplies and the maintenance of equipment are other subjects for discussion, especially if the supervisor is responsible for the supply of drugs, biologicals, and other expendable items as well as for printed record forms. Where the delivery of these supplies is delayed, as evidenced by the date of inventory and of receipt, the supervisor should note the fact so that action may be taken to rectify the delay. In the matter of drug distribution she should give specific advice as to which drugs are free or, if applicable, where and at what price they may be obtained, and what the policy of treatment is with regard to the available supply of drugs.
- In-service education for existing staff and orientation for new staff should not be neglected, especially as they concern new techniques, e.g., those used in administering freeze-dried vaccines and in simultaneous vaccination.
- The physical appearance of the health centre has a lot to do with the confidence of the public in the health services offered. In this context the nurse should be an aesthetics adviser.

3.3 At the central level

As all health services expand, there is a need to have a nurse at the central level to give leadership to the nursing aspects of health care. This raises the question of the nurse's place in the organizational structure, a question which can be answered only after several factors have been considered, particularly the status of nursing, the availability of nurses, the level of their preparation, and the existing structure of health administration. Accordingly, a nurse may be in charge of a separate bureau of nursing within the Ministry of Health or she may be under the direction of a medical administrator.

3.3.1 Responsibilities to the Ministry of Health: Nurses, where they exist at national level, should be directly involved as advisers to the Ministry of Health in policy making and in planning as regards the total health programme. In this context, they, in consultation with other health personnel at national level - doctors, hospital and public health administrators, statisticians, budget officers, etc. - should undertake the following:

- interpret the role of nursing, including the nurse's responsibility for the control of communicable diseases, of which tuberculosis is the major one and the most urgent in some countries;
- determine the needs and resources for nursing services, including those for tuberculosis control;
- set standards for recruitment to nursing services and the staffing thereof, including the staffing of tuberculosis services;
- set standards for the preparation of nursing personnel, both professional and auxiliary, in basic and post-basic programmes;

- contribute to the assessment of the general health programme, including the tuberculosis programme, as a basis for future reorganization and planning.

As a part of assessing needs and resources for nursing services, the chief nurse will have to determine the number of existing personnel in all categories, their preparation, their functions, the possibilities for future recruitment and training according to the expansion of the health programme, the availability of other health personnel, the cultural patterns of a country, its political philosophy and its economic status. These factors, once determined, will have to be considered when staffing patterns are being developed and when criteria are being set up for both the recruitment and the placement of personnel.

In setting standards for the preparation of nursing personnel, the chief nurse will have to review training institutions, the types of courses offered, the qualifications of the teachers, and the specific types of nursing personnel - auxiliary and professional - needing training. With the expansion of public health services and the increased demand for public health nurses, it is important that the preparation of nurses for their work in public health services be integrated into basic nursing education.

As regards the assessment of the general health programme, the chief nurse must rely on the information forwarded to her by nurses at the intermediary level of administration. On the basis of this information, she will participate in the reorganization of health programmes.

3.3.2 Responsibilities to nurses at intermediate levels: The chief nurse at the highest level will be responsible for interpreting to the nurses at intermediate levels those policies which have been developed and are in need of implementation. Guidance as to implementation will be an important part of such interpretation.

4. QUALIFICATIONS OF NURSES AT VARIOUS LEVELS¹

4.1 Peripheral level

The qualifications of nursing personnel at this level will depend on available resources in the community. Ideally, the nurse, who may frequently be a male, should have qualified from a recognized school of nursing and have preparation in public health nursing. However, in many countries a nurse with these qualifications may not be available and an auxiliary nurse will be used.

The qualifications of auxiliary nurses will vary, but they are expected to include some formal training including preparation in both preventive and curative aspects of health services. Single-purpose health workers from former specialized programmes (yaws, malaria, leprosy, tuberculosis) which have been absorbed into general health services may be given a period of reorientation and re-training and appointed to the duties to be undertaken at the peripheral level. This group has some advantages over new recruits of the same educational level: they are already in the service; they understand the organizational pattern of their agency, government or private; they are accustomed to accepting responsibility; and very often they have long experience as field workers on mobile exercises.

Provision must be made for in-service training for all nursing personnel at the peripheral level. Some encouragement to take further studies could be offered to those - both professional and auxiliary - who show special ability and interest. They would then be prepared to accept further responsibility.

¹ Reference may be made to the document, Basic Health Services (PHA - second draft), where the role of health personnel in the development of basic health services is described at peripheral, intermediate and central levels.

Both nurses and auxiliaries from former BCG programmes could give on-the-job instruction to peripheral health unit workers or assist with in-service training programmes by teaching and demonstrating procedures in tuberculin testing and reading and in BCG vaccination.

4.2 Intermediate level

The qualifications of nurses at this level will vary according to the availability of nursing personnel, the standard of nursing education in the country, the concept of the role of nursing at the higher administrative level, and the allocation of funds for nursing service and education. The nurse at the intermediate level should have qualified at a recognized school of nursing and have received preparation in public health nursing. For the nurse who lacks the latter, an orientation to public health nursing should be made available. If possible, the nurse at the intermediate level should also have received post-basic preparation in public health, with some emphasis on experience in supervision and administration.

In countries where a nurse with these qualifications is not available, the selection might be made from those members of the field staff who are skilled and dedicated in their duties and show potential for leadership.

4.3 Central level

The nurse at this level should have qualified at a recognized school of nursing and have had post-basic preparation, preferably in public health nursing. If possible she should have received advanced preparation and experience in supervision and administration; she must have a comprehensive knowledge of the principles of public health nursing and of the administrative structure of the health services at all levels; and she must have a demonstrated ability as a supervisor and administrator and as an effective participant in programme planning.

5. EVALUATION

Evaluation is an essential part of planning for nursing services and should be built into the plan from the beginning. A simple but meaningful system for evaluation should be planned to determine whether a programme, method, procedure or product has: helped the patient; increased efficiency; reduced costs; improved the service, etc.

Depending on the level of functioning, nurses will have varying degrees of responsibility in: planning for the evaluation of nursing programmes; evaluating the objectives of the nursing services; collecting data that might be useful in the evaluation of nursing services; and in interpreting findings and using them effectively for re-planning.

There are several tools which nurses can use in evaluation:

Nursing records, a description in both statistical and narrative form of the services rendered, will help the nurse to determine to what degree the programme is reaching those who need it. To be effective, nursing records must be detailed and properly focused to measurable factors. They must attempt to convey not only how many patients are reached but how they react and why they react as they do to health care. For example, the failure of many patients to keep clinic appointments or to collect drugs (see section 3.3.3.6) may be due to various reasons which the nurse will have noted in her nursing record. These must be investigated.

Case studies are also useful in evaluation. Through discussion and analysis of a single case or a group of cases, the nurse may evaluate some general aspects of her work as well as her performance in a particular situation. These, in turn, will offer valuable clues to the establishment of criteria for excellence in service.

Supervisory visits to the field, if properly focused - by both the supervisor and the nurse - on a common objective, namely, the improvement of care given to families, may be one of the most potent tools for the evaluation and improvement of performance.

The findings derived from an evaluation of services should indicate the changes that need to be made to improve the services. Just as nurses at all levels - and especially at intermediate and national levels - co-operate in evaluating the service, they should also have a part in planning its improvement. Such improvements may entail a modification of objectives, a re-emphasis as regards priorities, or even the elimination of obsolete practices.

6. SUMMARY

The most profound changes that have occurred in tuberculosis control are those which have allowed patients to leave sanatoria and return to a more normal life in the community. The delegation of tuberculosis services to general dispensaries and health centres has been an important factor in the control of tuberculosis, a realistic objective in any health centre, however scarce its resources.

In a programme so conceived, nurses play a large role. It is necessary, therefore, that they understand not only the principles on which a comprehensive tuberculosis programme is based and improved but the details of nursing care involved. This guide has attempted to provide most of these details, especially as they relate to the work of nurses at the peripheral level.

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