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# A GUIDE TO ELIMINATING LEPROSY AS A PUBLIC HEALTH PROBLEM

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## PREFACE

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*We have never come so close to seeing leprosy conquered. Even though the disease continues to afflict a large number of people, it is now possible to eliminate it as a public health problem. As a result of the very encouraging results from 10 years' intensive use of treatment based on a combination of antileprosy drugs, known as multidrug therapy (MDT), the World Health Assembly in 1991 resolved to eliminate leprosy as a public health problem by the year 2000. Later, a WHO Working Group on Leprosy outlined the strategy for eliminating the disease and, since then, practically all the major endemic countries have implemented action plans to eliminate the disease.*

*The central part of the elimination strategy is to make the WHO-recommended MDT accessible to all patients, including those living in difficult to reach areas and populations.*

*The purpose of this Guide is to enable every health worker in endemic countries to contribute to the historic task of reaching all leprosy patients with MDT and attaining the goal of eliminating leprosy as a public health problem. Although the Guide is likely to be useful for health workers at all levels, it is targeted mainly at those who have major responsibilities for organizing and implementing leprosy work in the field. It can be used both as self-learning material as well as material for training courses.*

*The Guide aims to give a clear picture of what needs to be done to implement MDT and attain the elimination goal. It does not attempt to cover every aspect of the disease and is certainly not meant to replace textbooks on leprosy. Only the most important concepts are discussed and details of action to be taken, including technical steps, are given. Users may refer to the documents listed at the end of the Guide for further information.*

*The Guide has been prepared through contributions from Dr M. Virmond, Brazil, and staff of the Action Programme for the Elimination of Leprosy at WHO Headquarters in Geneva. Acknowledgement is made to the various WHO publications and documents on leprosy and leprosy elimination, and suggestions from a number of experts and institutions listed below.*

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## THE DISEASE: LEPROSY

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Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*, an acid-fast, rod-shaped bacillus. The disease mainly affects the skin, the peripheral nerves, mucosa of the upper respiratory tract and also the eyes, apart from some other structures.

Leprosy has afflicted humanity since time immemorial. It once affected every continent and it has left behind a terrifying image in history and human memory - of mutilation, rejection and exclusion from society.

### **EPIDEMIOLOGY: Some facts**

- ▶ Leprosy can affect all ages and both sexes.
- ▶ The disease has a very long period of incubation or latency running into several years. Most often the incubation period is between 3 to 5 years. Leprosy is an infectious disease directly transmitted from man to man. However, it is acquired through prolonged exposure and only a small proportion of the population is affected.
- ▶ Leprosy is transmitted from one untreated person to another via the respiratory tract or skin.

## IMPORTANCE OF THE PROBLEM

Leprosy has struck fear into human beings for thousands of years, and was well recognized in the oldest civilizations of China, Egypt and India. The number of individuals who, over the millennia, have suffered its chronic course of incurable disfigurement and physical disabilities can never be calculated. Since ancient times, leprosy has been regarded by the community as a contagious, mutilating and incurable disease. These aspects led to an intense reaction from the community, making them dread people afflicted with the disease more than the disease itself.

There are many countries in Asia, Africa and Latin America with a significant number of cases. As of 1995 around 2 400 000 000 people live in countries where the prevalence of the disease is more than one case per 10 000 population. It is estimated that in 1995 there are between one and two million people visibly and irreversibly disabled due to past and present leprosy who require to be cared for by the community in which they live.

However, the social picture of leprosy has changed over the last decades. It is being regarded more and more as any other public health problem as, increasingly, patients are treated in general health services. All countries have officially adopted the outpatient clinic as the base for treating leprosy, while old and stigmatizing leprosaria are being phased out. This optimistic approach deserves strong support from health personnel and others at all levels in order to guarantee patients adequate treatment as well as self-respect.

## IN THE PAST

When *M. Leprae* was discovered by G.A. Hansen in 1873, it was the first bacterium to be identified as causing disease in man. However, treatment only became available in the late 1940s with the introduction of dapsone, and its derivatives. This revolutionized the approach to leprosy control, since patients could be treated in outpatient clinics, making the highly stigmatizing isolation no longer necessary.

However, leprosy bacilli resistant to dapsone gradually appeared and became widespread, patients found the improvement very slow and the period of treatment much too long, as a result of which they tended to become irregular in attendance and non-compliant. Thus, treatment with dapsone monotherapy became less and less successful, and control of the disease became generally ineffective.

## CURRENT SITUATION

The top 25 endemic countries contribute 92% of the estimated leprosy cases in the world whilst the top 5 countries contribute more than 80%. In 1995, there were an estimated 1.8 million cases in the world, most of them concentrated in South-East Asia, Africa and the Americas. Among these 1.3 million were registered for treatment of whom 1 million were being treated with MDT. The number of new cases detected worldwide each year is about half a million.

WHO REGION	Registered cases	Detection	MDT Coverage %
Africa	113 650	47 900	80.60
Americas	195 891	36 623	65.85
Eastern Mediterranean	23 219	6 504	81.51
Europe	4 916	-	47.38
South-East Asia	913 664	456 882	76.38
Western Pacific	40 508	12 737	97.70
<b>Total</b>	<b>1 291 848</b>	<b>560 719</b>	<b>76.17</b>

## INTRODUCTION OF MULTIDRUG THERAPY (MDT)

The first recommendation of standard MDT regimens, made by a WHO Study Group on Chemotherapy in 1981, began an era of optimism. The recommendations received enthusiastic support from all leprosy-endemic countries, international and nongovernmental organizations (NGOs), donor agencies and professional bodies alike. What seemed impossible 10 years earlier had become a reality with the appearance of MDT - a simple and relatively inexpensive course of treatment. MDT is well-tolerated and accepted by patients, and it is highly effective. It rapidly cures patients, interrupts further transmission of the disease and therefore makes elimination of the disease a possibility.

The introduction and expansion of MDT has dramatically changed the leprosy profile in all endemic countries. The estimated global prevalence has been reduced by more than 80% in the last 10 years. MDT is so effective that, even when applied by health services with limited infrastructure and resources, very few patients fail to respond to it. It is estimated that, compared to dapsone monotherapy, MDT by 1995 had prevented between 500 000 and 1 000 000 cases of relapse.

### Advantages of MDT

- ▶ Highly effective in curing the disease
- ▶ Reduces the period of treatment
- ▶ Well-accepted by patients
- ▶ Easy to apply in the field
- ▶ Prevents development of drug resistance
- ▶ Interrupts transmission of infection
- ▶ Reduces risk of relapse
- ▶ Prevents disabilities
- ▶ Improves community attitude

In addition, the combinations of multiple drugs employed in these regimens prevent the occurrence of drug resistance. Due to its effectiveness and the indirect improvements brought about in case-detection and patient care, it is estimated that MDT has also prevented between 1 000 000 and 2 000 000 patients from being physically disabled.

The intense social stigma attached to leprosy and the social discrimination against its sufferers is beginning to weaken as the message that the disease is now completely curable is spreading far and wide. At the same time, there is also much greater community awareness of the disease and more and more individuals are self-reporting to health centres for diagnosis and treatment.

In a number of well-organized programmes, the number of new cases detected annually is steadily decreasing, thus clearly demonstrating the impact of MDT on the transmission of the disease.

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## ELIMINATING LEPROSY

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The battle against leprosy is now reaching its crucial stage. The fight will be on many fronts but, as in all battles, the outcome will be decided in the field, where leprosy workers have been toiling hard and long. We face a big challenge and a unique opportunity to make leprosy disappear, through the vigorous implementation of MDT. Eventually communities will no longer need to look after people who are handicapped by leprosy, often for life.

In 1991, the Member States of WHO, through a resolution in the World Health Assembly, declared their intention to eliminate leprosy as a public health problem by the year 2000. In the same year, a Working Group on Leprosy outlined the strategy for elimination of the disease.

**DEFINITION**

Elimination and eradication have somewhat different meanings and the term elimination is increasingly used to describe drastic reductions in the prevalence of a disease to the extent that it no longer constitutes a public health problem. Eradication, on the other hand refers to the complete stopping of transmission as a result of the total disappearance of the disease-causing organism. It should be realized that, while it is possible to eliminate leprosy as a public health problem by the year 2000, it will take much longer to eradicate the disease.

The elimination of leprosy as a public health problem means reducing the prevalence of leprosy to below one case per 10 000 population.

**THE ELIMINATION STRATEGY:  
A flexible approach**

The elimination strategy is based on a focused flexible approach. The distribution of leprosy among and within countries is quite uneven and, equally, the delivery of leprosy control services varies considerably both in quality and quantity. Some areas have developed specialized leprosy services whilst others manage patients within integrated health services, even though most have specialized supervisory and referral components. With these variations and the time-limited nature of the goal, the strategy for eliminating leprosy must be capable of adapting to differing needs.

### Elimination of leprosy will be achieved by:

- ▶ making MDT accessible to all communities and areas;
- ▶ treating all registered cases with MDT;
- ▶ diagnosing and promptly treating all new cases;
- ▶ improving quality of patient care, including disability prevention and management;
- ▶ ensuring regularity and completion of treatment;
- ▶ enlisting community support for the patients and the programme.

### ESSENTIAL ELEMENTS OF THE STRATEGY

For the Elimination Strategy to be effective, it must be simple enough to be widely implemented and flexible enough to adapt to the changing needs of disease control. It is vital that programme personnel involved in developing and carrying out national disease control policies take into consideration the key elements of this global strategy. Personnel involved in this process at intermediate and peripheral levels need to consider those elements of the strategy that deal with day-to-day activities in the field.

## **ESSENTIALS OF THE ELIMINATION STRATEGY:**

The main thrust of the strategy to eliminate leprosy is to:

- ▶ expand MDT services to all health facilities;
- ▶ ensure that all existing and new cases are given appropriate MDT regimens;
- ▶ encourage all patients to take treatment regularly and completely;
- ▶ promote awareness in the community about leprosy so that individuals with suspicious lesions will report voluntarily for diagnosis and treatment;
- ▶ set targets and time-table for activities and make all efforts to achieve them;
- ▶ keep good records of all activities in order to monitor the progress towards elimination.

## ESSENTIAL ACTIVITIES INCLUDED IN THE LEPROSY ELIMINATION STRATEGY

### PREPARATORY ACTIVITIES

- A. Plan of action
- B. Mobilization of resources
- C. Organization of MDT services

### SUPPORTIVE ACTIVITIES

- A. Patient and family counselling
- B. Community education
- C. Referral systems
- D. Promotion of social and economic integration

### CORE ACTIVITIES

- A. Updating of registers
- B. MDT implementation
- C. Treatment compliance and completion
- D. Case-detection
- E. Disability prevention and management

### EVALUATING ACTIVITIES

- A. Programme monitoring and evaluation
- B. Epidemiological surveillance

## DIAGNOSIS OF LEPROSY

### A case of leprosy

A case of leprosy is a person, having one or more of the following, who has yet to complete a full course of treatment:

- ▶ hypopigmented or reddish skin lesion(s) with definite loss of sensation;
- ▶ damage to the peripheral nerves, as demonstrated by loss of sensation and weakness of the muscles of hands, feet or face;
- ▶ positive skin smears.

### DIAGNOSIS

Diagnosis of leprosy is most commonly based on clinical signs and symptoms. These are easy to observe and elicit by any health worker after a short period of training. In practice, people with such complaints usually report on their own to health centres. Only in rare instances is there a need to use laboratory and other investigations to confirm a diagnosis of leprosy.

### Ethical responsibility in leprosy diagnosis

It is important to remember that the diagnosis of leprosy is a very serious matter for the individual and his/her family. If in the slightest doubt, avoid making a diagnosis and categorize the individual as 'suspect'. Inform the individual about the common signs and symptoms of the disease and ask him/her to report back after six months, or if there is any worsening of the signs/symptoms.

Alternatively, the individual may be referred to other specialists (e.g. dermatologist or neurologist), as appropriate, to establish the correct diagnosis of the condition.

## CARDINAL SIGNS OF LEPROSY

In an endemic country or area, an individual should be regarded as having leprosy if

he or she shows **ONE** of the following cardinal signs:

1. *skin lesion consistent with leprosy and with definite sensory loss*
2. *positive skin smears*

The **skin lesion** can be single or multiple, usually less pigmented than the surrounding normal skin. Sometimes the lesion is reddish or copper-coloured. A variety of skin lesions may be seen but macules (flat), papules (raised), or nodules are common. **Sensory loss** is a typical feature of leprosy. The skin lesion may show loss of sensation to pin prick and/or light touch.

**Nerve damage**, mainly to peripheral nerve trunks, constitutes another feature of leprosy. These may be loss of sensation in the skin and weakness of muscles supplied by the affected nerve. *In the absence of these signs, nerve thickening by itself, without sensory loss and/or muscle weakness is often not a reliable sign of leprosy.*

**Positive skin smears:** In a small proportion of cases, rod-shaped, red-stained leprosy bacilli, which are diagnostic of the disease, may be seen in the smears taken from the affected skin when examined under a microscope after appropriate staining.

### **A simple test for diagnosis**

- ▶ You will need a clean sharp needle or pin.
- ▶ Tell the person what you are going to do and demonstrate it.
- ▶ The person should be blindfolded or some barrier should be used to prevent him or her from watching the procedure.
- ▶ Touch the centre of the skin patch with the pin. Apply light pressure ( never pierce or cause bleeding ).
- ▶ Ask the individual if he or she feels the pain.
- ▶ Test the same area, and also areas of normal skin, with both the sharp and blunt ends of the pin, so that you can compare.

## **CLINICAL EXAMINATION**

### **History of illness:**

The leprosy history should elicit the following:

- the nature of the first lesion or symptom and its subsequent progress. This is because the skin lesions usually develop slowly over several months and are not troublesome;
- the treatment received in the past: to decide if there is a need for further treatment;
- a general history about any significant past or present illnesses: attention to contra-indications to MDT and wherever possible, to any other illness or condition calling for treatment and/or referral.

### **Examination for leprosy**

- The leprosy examination should, preferably, be performed in daylight.
- The whole body surface should be examined, care being taken to respect the patient's privacy.
- The location of skin lesions should be marked on a simple body outline chart.
- One or a few typical skin lesions should be tested for loss of sensation.
- The main peripheral nerve trunks should be palpated to ascertain any thickening and tenderness.
- Eyes, hands and feet should be examined. Any disability if present should be recorded using WHO's 0-2 disability grading system.

In an endemic country, a person showing a hypo-pigmented or reddish skin lesion with definite loss of sensation is a case of leprosy.

## A SUSPECT CASE

A person presenting with skin lesions or with symptoms suggestive of nerve damage, in whom the cardinal signs are absent or doubtful should be called a 'suspect case' in the absence of any immediately obvious alternate diagnosis. Such individuals should be told the basic facts of leprosy and advised to return to the centre if signs persist for more than six months or if at any time worsening is noticed. Suspect cases may also be sent to referral clinics with more facilities for diagnosis. *(Some programmes may find it worthwhile to keep a record of such individuals in a 'Suspect Case Register' in order to periodically reassess their condition.)*

### Referral for Diagnosis

Suspect cases may fall into one of the following categories:

1. one or more suggestive skin patches with normal sensation
2. extensive loss of sensation in the hands or feet with no other evidence of leprosy
3. one or more grossly enlarged peripheral nerve trunks with no sensory loss or skin lesion
4. painful nerves with no other evidence of leprosy
5. painless ulcers on hands and/or feet with no other evidence of leprosy
6. nodules on the skin with no other evidence.

Some of these findings may also occur in conditions other than leprosy. It is better to refer individuals presenting with such complaints to the nearest referral centre. Such cases may require more detailed examination including laboratory and other tests.

**Leprosy should never be diagnosed in the absence of definite evidence.**

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## CLASSIFICATION OF LEPROSY

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### CHOOSING THE APPROPRIATE MDT REGIMEN

Leprosy can be classified on the basis of clinical manifestations and skin-smear results. In the classification based on skin-smears, patients showing negative smears at all sites are grouped as paucibacillary leprosy (PB), while those showing positive smears at any site are grouped as having multibacillary leprosy (MB). However, in practice, most programmes use clinical criteria for classifying and deciding the appropriate treatment regimen for individual patients, particularly in view of the non-availability or non-dependability of the skin-smear services. The clinical system of classification for the purpose of treatment includes the use of number of skin lesions and nerves involved as the basis for grouping leprosy patients into MB and PB leprosy.

**While classifying leprosy, it is particularly important to ensure that patients with MB disease are not treated with the regimen for the PB form of the disease. Therefore, when classification is in doubt, the patient should be treated with the MDT regimen for MB leprosy.**

## A guide for clinical classification\*\*

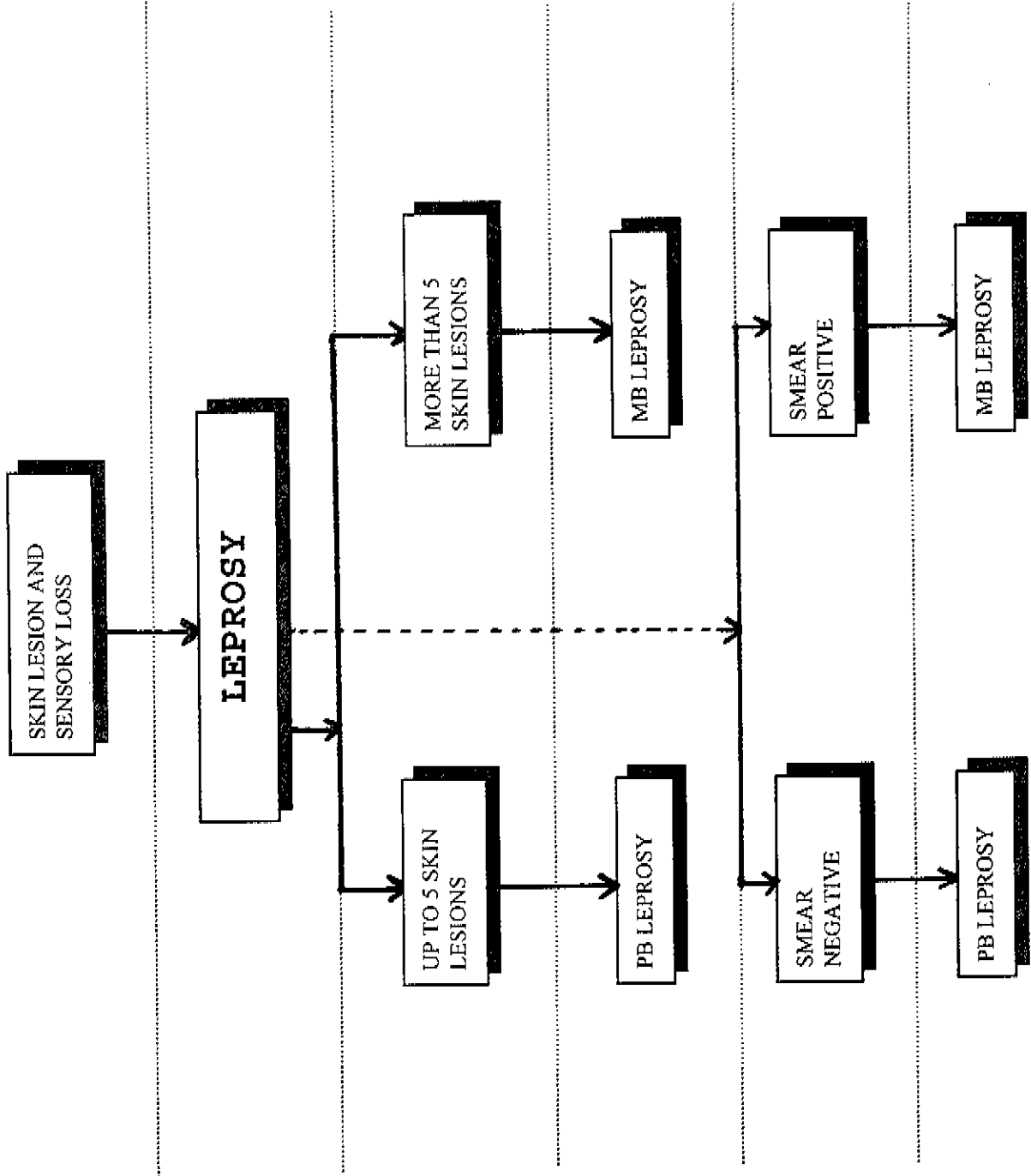
	<b>Paucibacillary leprosy</b>	<b>Multibacillary leprosy</b>
<b>Skin lesions</b> (includes macules-flat lesions, papules-raised lesions and nodules)	<ul style="list-style-type: none"> <li>- 1-5 lesions</li> <li>- hypopigmented or erythematous</li> <li>- asymmetrically distributed</li> <li>- definite loss of sensation</li> </ul>	<ul style="list-style-type: none"> <li>- more than 5 lesions</li> <li>- distribution more symmetrical,</li> <li>- loss of sensation</li> </ul>
<b>Nerve damage</b> (resulting in loss of sensation or weakness of muscles supplied by the affected nerve)	<ul style="list-style-type: none"> <li>- only one nerve trunk</li> </ul>	<ul style="list-style-type: none"> <li>- many nerve trunks</li> </ul>

Any patient showing a positive skin smear, irrespective of the clinical classification, should be treated with the MDT regimen for MB leprosy.

\*\* Some programmes classify leprosy using other systems of classification. For the purpose of treatment this is not necessary. However, if used, multibacillary leprosy (MB) includes both lepromatous (L) and borderline (B) leprosy in the Madrid classification and LL, BL, BB and some BT leprosy in the Ridley & Jopling classification. Paucibacillary leprosy (PB) includes indeterminate (I) and tuberculoid (T) leprosy in the Madrid classification, and I, TT and most BT leprosy in the Ridley & Jopling classification.

# FLOWCHART FOR DIAGNOSIS AND CLASSIFICATION

LOOK FOR SKIN LESIONS COMPATIBLE WITH LEPROSY AND TEST FOR SENSORY LOSS
DIAGNOSE
WHEN SKIN-SMEARS ARE NOT AVAILABLE OR NOT DEPENDABLE
CLASSIFY
WHEN SKIN-SMEARS ARE AVAILABLE AND DEPENDABLE
CLASSIFY



## BACTERIOLOGICAL EXAMINATION

*A simplified system*

### Frequency of skin smear examinations

If reliable facilities for skin smears are available, then ideally all patients should have **one** examination before starting MDT. The main objective for this is to prevent any MB case being treated with the MDT regimen for PB.

### Sites for skin smears

In view of the increasing prevalence of human immunodeficiency virus (HIV) and hepatitis B infection in many countries where leprosy remains endemic, the number of skin-smear sites and the frequency of smear collection should be limited to the minimum necessary. Remember that all skin-piercing procedures have the potential risk of transmitting HIV and hepatitis infection.

For routine purposes, only one or two sites should be smeared from the edge of the leprosy lesion/s.

### Smear taking

- ▶ Explain the procedure to the patient and, in case of children, to the parents.
- ▶ Ask the patient to sit comfortably on a stool .
- ▶ Wash your hands thoroughly with soap and water. *All aseptic procedures should be followed.*

- ▶ The skin area chosen for the smear is cleaned by rubbing with a small cotton-wool swab dipped in spirit, and allowed to dry.
- ▶ The skin is then pinched up into a fold between the index finger and thumb.
  
- ▶ With a sterile disposable blade an incision is made about 5 mm long and 3 mm deep, pressure of the fingers being maintained. If blood or tissue fluid exudes, it should be wiped off with a sterile dry cotton-wool swab.
  
- ▶ The blade of the scalpel is turned at right angles to the line of the cut and the wound is scraped several times so that tissue fluid and pulp collect on the side of the blade.
  
- ▶ This material is then gently smeared on a glass slide with the flat of the blade to produce a uniform and moderately thick smear over an area 5-7 mm in diameter. The slide must be *carefully labelled with patient identification, date and name of the centre.*
  
- ▶ The cut is dressed with a small sterile dressing.

Please use a new disposable blade for the next patient. The same blade should never be used on another patient.

## **Fixation of smears**

The smear is fixed by passing the slide, with the smear uppermost, two or three times over a spirit flame. The smears should not come in direct contact with the flame and the glass slide should become only slightly warm to touch.

## **Storage and transport**

All slides should be stored in a slide box protected from moisture and dust. The box containing slides should be labelled and sent to the laboratory as soon as possible.

## **Staining**

The leprosy smears are commonly stained by a method known as modified Ziehl-Neelsen technique. The procedure is as follows:

- ▶ Flood the slide with freshly filtered carbol-fuchsin and allow to stand for 20 minutes.
- ▶ Wash gently in tap water.
- ▶ De-stain with acid-alcohol mixture for 3 to 5 seconds.
- ▶ Wash gently in tap water.
- ▶ Counter-stain with methylene blue for one minute.
- ▶ Wash gently in tap water and allow to dry.

### **Examination under the microscope**

- ▶ Focus on the smear with a low-power objective lens.
- ▶ Put a drop of immersion oil on the smear.
- ▶ Switch to the oil immersion lens.
- ▶ Start the examination at one end of the smear and proceed in a zig-zag fashion.
- ▶ Examine each adjacent field until lepra-bacilli are seen.
- ▶ If lepra bacilli are found, stop the search and record the result as positive.
- ▶ If no bacilli are seen after searching 100 fields, report the result as negative.

### **Reporting results**

The result should be reported as positive or negative.

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## **ORGANIZING DIAGNOSTIC SERVICES**

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The most cost-effective approach to motivating individuals with suspicious lesions to report on their own to the health centre for diagnosis is by assuring the community that leprosy is curable and informing them about the availability of effective and accessible treatment services.

**There are two basic principles to achieving early self-reporting:**

- I provision of efficient health services for diagnosing and treating leprosy, and
- II increasing the community's awareness of early signs and the curability of leprosy, sometimes through special campaigns.

**PROVISION OF EFFICIENT HEALTH SERVICES**

This will include the ability to:

- Diagnose leprosy and classify the disease at least clinically into MB and PB.
- Recognize and manage the common complications of the disease.
- Identify and refer serious complications.
- Have a regular supply of MDT drugs.
- Have supportive drugs to treat some common ailments.
- Recognize and treat/refer any drug side-effects.
- Maintain proper recording and reporting.
- Organize convenient location and timing of the clinics
- Maintain cordial and friendly relation with all patients and the local community.
- Ensure commitment and motivation to eliminate leprosy from the area.

## HOW TO INCREASE AWARENESS IN THE COMMUNITY?

The signs of leprosy are usually minimal in the early stages. Sometimes the patient may report the

disease only at a later stage when it is obvious. The following activities may help in early reporting of the disease:

- Informing the community about the signs and symptoms of leprosy, strongly stressing that it is a curable disease, and encouraging patients to seek treatment without delay,
- Informing about locations and timing of available services,
- Informing about the availability of free treatment,
- Informing that starting treatment without delay will prevent disabilities,
- Requesting the local community leaders, teachers, religious authorities and traditional medical practitioners to participate in health education activities,
- Using the local newspaper/radio/TV to inform about leprosy,
- Organizing special campaigns.

### Levels, tasks and responsibilities for diagnosis and treatment

Levels	Tasks	Responsibilities
Community & Family members	Recognition of skin lesions and loss of sensation	Reporting to the health centre for diagnosis
Community health volunteer	Informing families about early signs, treatment and availability of services	Directing individuals to the health centre for diagnosis
Primary Health Service personnel	Training community health volunteers and informing the community	Diagnosing cases and starting MDT
Referral services personnel	Training of health service personnel	Diagnosis of difficult cases referred by the health centre

## WHO IS LIKELY TO REPORT TO THE HEALTH CENTRE?

The persons reporting to the health centre for diagnosis and treatment of leprosy are the following:

<b>Persons reporting</b>	<b>Action to be taken</b>
Leprosy cases who were never treated before	Examine carefully, diagnose, classify, explain facts about the disease and treatment, start MDT.
Leprosy cases who had treatment with dapsone in the past	Ask details of past treatment, check records if available, if MB start MDT. If PB, examine carefully, if signs of active leprosy present, start MDT. If no active signs present, reassure, explain facts about the disease. In case of doubt, start MDT.
Leprosy cases who had treatment with MDT in the past	Ask details of past treatment, check records if available, examine carefully. If a full course of appropriate MDT regimen was completed, reassure, explain facts about the disease and advise to return if necessary. If not, start MDT.
Suspect cases	Examine carefully, if no signs of leprosy, reassure, explain facts about the disease and advise to return if necessary. If in doubt, refer.
Other conditions causing skin lesions	Examine carefully, diagnose and treat skin condition, or refer.
Other conditions causing nerve damage	Examine carefully, diagnose and treat condition or refer.
Contacts of leprosy patients for check up	Examine carefully. If a cardinal sign is present diagnose, classify and treat. If not, explain facts about the disease, advise to return if necessary.
Normal individuals for information and/or check up	Examine carefully, explain facts about the disease, clear doubts.

**Before you announce the diagnosis of leprosy to the person and his or her family: Think again - Check your findings - Reconfirm the cardinal sign/s. If in doubt: Explain. Wait. Follow-up. Refer.**

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## TREATMENT OF LEPROSY

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All registered and newly diagnosed cases must be started on an appropriate MDT regimen immediately. The WHO-MDT regimens are "robust", i.e. their efficacy is not impaired by minor irregularities in compliance. Their application requires little in the way of infrastructure and training.

There is only one pre-requisite to starting an MDT programme:  
**Availability of MDT drugs.**

### MDT DRUGS

The drugs used in WHO-MDT are a combination of rifampicin, clofazimine and dapsone for MB patients and of rifampicin and dapsone for PB patients. Among these, rifampicin is the most important drug and therefore is included in the treatment of both types of leprosy.

Treatment of leprosy with only one antileprosy drug will always result in development of drug resistance to that drug. Treatment with dapsone or any other antileprosy drug used as monotherapy should be considered as unethical practice.

**Rifampicin**

The drug is given once a month. Toxic effects have rarely been reported in the case of monthly administration. The urine may be slightly reddish in colour for a few hours after its intake. This should be explained to the patient when starting MDT.

**Clofazimine**

Clofazimine is most active when administered daily, is well-tolerated and virtually non-toxic in the dosage used for MDT. The drug causes brownish-black discolouration and dryness of the skin but although this disappears within a few months after stopping treatment it should, nevertheless, be explained to patients starting the MDT regimen for MB leprosy.

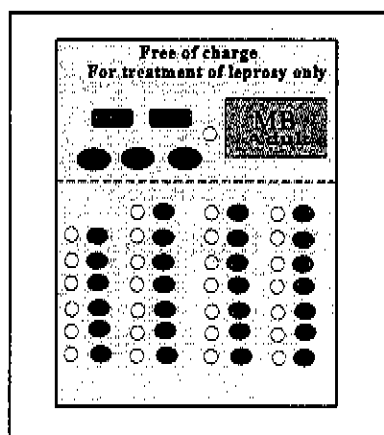
**Dapsone**

Dapsone is very safe in the dosage used in MDT. Side-effects are rare but the main one is allergic reaction, causing itchy skin rashes and exfoliative dermatitis. Therefore, patients known to be allergic to any of the sulpha drugs should not be given dapsone.

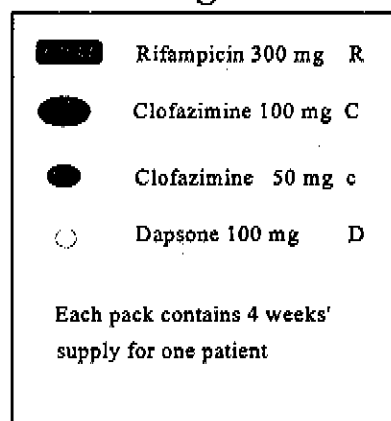
## WHO-RECOMMENDED MDT REGIMENS

### Blister Pack for Multibacillary (MB) Patients

#### Front



#### MDT Drugs



#### Dosage (Adult MB)

##### *Monthly Treatment: Day 1*

Rifampicin 600 mg (2 X 300mg)  
Clofazimine 300 mg (3 X 100mg)  
Dapsone 100 mg

##### *Daily Treatment: Days 2 - 28*

Clofazimine 50 mg  
Dapsone 100 mg

##### *Duration of Treatment:*

24 blister packs to be taken within  
a period of between 24 to 36  
months.

#### Dosage (Child\* MB)

##### *Monthly Treatment: Day 1*

Rifampicin 450 mg (3 X 150) mg  
Clofazimine 150 mg (3 X 50mg)  
Dapsone 50 mg

##### *Daily Treatment: Days 2 - 28*

Clofazimine 50 mg every other day  
Dapsone 50 mg daily

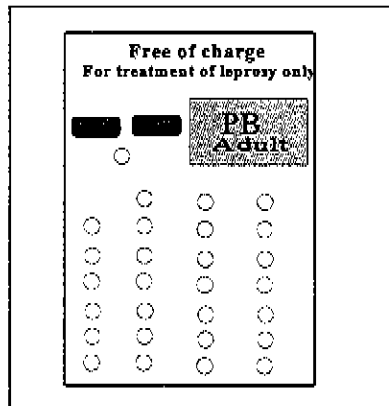
##### *Duration of Treatment:*

24 blister packs to be taken within  
a period of between 24 to 36  
months.

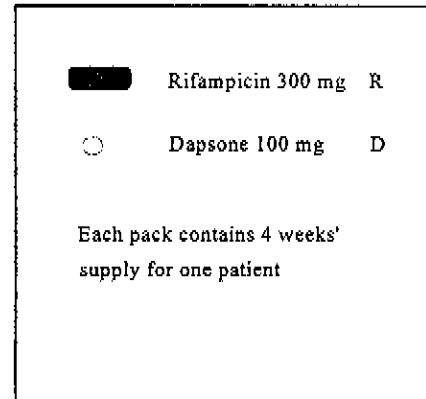
\* 10-14 years

## Blister Pack for Paucibacillary (PB) Patients

### Front



### MDT Drugs



### Dosage (Adult PB)

#### *Monthly Treatment: Day 1*

Rifampicin 600 mg (2 X 300mg)

Dapsone 100 mg

#### *Daily Treatment: Days 2 - 28*

Dapsone 100 mg

#### *Duration of Treatment:*

6 blister packs to be taken within a period of between 6 to 9 months.

### Dosage (Child\* PB)

#### *Monthly Treatment: Day 1*

Rifampicin 450 mg (3 x 150) mg

Dapsone 50 mg

#### *Daily Treatment: Days 2 - 28*

Dapsone 50 mg

#### *Duration of Treatment:*

6 blister packs to be taken within a period of between 6 to 9 months.

\* 10-14 years

For children below 10 years the dose may be adjusted, for example, rifampicin 300 mg, dapsone 25 mg and clofazimine 100 mg once a month and 50 mg twice a week.

## GENERAL SAFEGUARDS FOR MDT DRUGS

- ▶ MDT drugs should not be given to patients with severe renal or hepatic dysfunction.
- ▶ Dapsone should not be given to patients with severe anaemia. The anaemia must be improved by appropriate treatment before therapy is started.
- ▶ Patients known to be allergic to sulpha drugs should not be given dapsone.

In the case of severe dapsone toxicity, PB patients should receive clofazimine 50 mg a day and a monthly dose of 300 mg as a substitute for dapsone. MB patients should continue treatment with rifampicin and clofazimine in the usual dosage.

## STEPS TO STARTING A PATIENT ON MDT

1. Assess the classification. If in doubt, classify as MB.
2. Explain the basic facts about leprosy and its management.
3. Explain to the patient about the monthly and daily components of MDT.
4. Inform about the duration of treatment for his/her condition.

5. Inform about the common side-effects of MDT drugs, such as reddish urine due to rifampicin, brownish discolouration due to clofazimine and the rare itchy rashes due to dapsone.
6. Inform about the common complications of leprosy, especially about reporting immediately in case of pain/tenderness in the nerves or development of sensory loss or weakness of muscles.
7. Ask the patient to report any side-effect or complication as soon as possible.
8. Give date and time for the next appointment, and supply enough drugs to cover the interval.

*Under special circumstances, such as problems of distance, cultural and social situations, occupation and nomadic life-style, patients may be given drugs for more than one month and exceptionally for the full six-months for PB patients and 24 months for MB patients.*

The first priority should be to complete 6 monthly doses for PB within 9 months and 24 monthly doses within 36 months for MB.

#### COMPLETION OF TREATMENT CURE

- ▶ Any PB patient who has taken six doses of PB-MDT within 9 months should be considered as cured.
- ▶ Any MB patient who has taken 24 doses of MB-MDT within 36 months should be considered as cured.

- ▶ All such patients should be told about the early signs of reactions and relapse and to report any such events promptly to the centre. If the individual has sequelae due to the disease, such as disabilities, he/she should be encouraged and helped to use the available facilities at the health centre or at an appropriate referral centre.

It is important to remember that a leprosy patient who has completed a full course of treatment should no longer be regarded as a case of leprosy, even if some sequelae of leprosy remain.

#### DEFAULTER MANAGEMENT ACTION

A defaulter is a patient who has not collected treatment for 12 consecutive months. Some programmes may choose a different period to define a defaulter. It is however important that adequate efforts are made to trace and persuade each defaulter to return for assessment and treatment before their removal from the register. ***The practice of keeping defaulters on registers indefinitely without taking any corrective action is unacceptable.***

Reasons for default	Action to be taken
Patient has moved out of your area	Record this information in the treatment register
Patient is taking treatment at another health centre	Record this information in the treatment register
Patient had unpleasant side-effects which he/she attributed to the treatment	It is important to reassure the patient, and if necessary refer him/her for investigations and management
Patient thinks that his/her condition has cleared completely	Confirm that this patient has been cured by clinical and where possible by skin- smear examination. If there are no active signs of leprosy and skin-smears are negative, consider the patient as cured. If there are active signs of leprosy or skin-smears are positive, reassess the classification and restart appropriate MDT regimen
No confidence in the treatment services	Improve the quality of services to regain the community and patients' confidence
Non-availability of services	Make efforts to establish MDT services and inform the community and patients

**An example: Defaulter Management Action:**

- a) the centre should review the treatment register annually during the month of January;
- b) prepare a list of patients who did not collect treatment during the last 12 months;
- c) visit homes of such patients during the month of January and persuade them to return for assessment and, if necessary, continuation of treatment;
- d) if a patient is not available during the first visit, request family or friends or neighbours to persuade the patient to report to the centre;
- e) if the patient does not report within a week, make a second visit to his/her home;
- f) by the end of January, review the treatment register and remove defaulters who are unlikely to come back;
- g) if any defaulter returns subsequently, make a careful clinical examination (with skin-smears, if available) and if found to have signs of active leprosy, re-register and start a new course of appropriate MDT regimen.

**Re-treatment of defaulters**

A defaulter who returns to the health centre for treatment and shows one or more of the following signs should be given a new course of MDT:

- reddish and/or elevated skin lesions (MB&PB)
- appearance of new skin lesions since last examination (MB&PB)
- new nerve involvement since last examination (MB&PB)

- lepromatous nodules (MB)
- signs of ENL or reversal reaction (MB).

## PATIENTS WITH SPECIAL NEEDS

### **Pregnancy**

The standard regimens are considered safe, both for the mother and the child, and therefore should be continued unchanged during pregnancy.

### **Isolated groups**

Some patients who live in geographically inaccessible areas or whose life style does not permit regular visits to the health centre (e.g. nomads) or who cannot attend clinics at certain times (e.g. rainy season) should be given a sufficient supply of drugs to cover the period of absence. It is acceptable to give a full course of treatment to these patients but they should be advised to report to the nearest health centre if they have any complications.

### **Tuberculosis**

Patients suffering from both tuberculosis and leprosy require appropriate antituberculosis therapy in addition to the standard MDT. Rifampicin will be common to both regimens and **it must be given in the doses required for tuberculosis.**

### **HIV infection**

The management of a leprosy patient infected with HIV is the same as that of any other patient. The information available so far indicates that the response of such a patient to MDT is similar to that of any other leprosy patient and management, including treatment of reactions, does not require any modifications.

**Relapse**

A patient who has completed the course of treatment may rarely develop new skin patches or nodules and/or new nerve damage, and may be suspected of having relapsed. However, if detected, this should be confirmed by a referral centre. If confirmed as relapse, MB patients should be given another course of standard MDT regimen for MB leprosy. PB patients should be re-treated with MDT regimen for PB leprosy, if their disease is still paucibacillary. If, however, multibacillary leprosy is diagnosed at the time of relapse, re-treatment should be with MDT for MB leprosy.

### Points on MDT treatment

- ▶ every leprosy patient should receive treatment with more than one antileprosy drug
- ▶ standard MDT is very safe and effective
- ▶ it is available free of charge for leprosy treatment in most centres
- ▶ standard MDT is for a fixed duration: 6 months (PB) or 24 months (MB)
- ▶ at the completion of a full course of MDT, the patient is cured
- ▶ use clinical criteria to classify and decide the treatment regimen
- ▶ if in doubt of classification, give MB treatment regimen
- ▶ active follow-up after completion of treatment is not necessary
- ▶ in case of relapse, re-treat with appropriate standard MDT regimen

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## MANAGEMENT OF COMPLICATIONS

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### LEPROSY REACTIONS

Leprosy reactions are episodes of sudden increase in the activity of the disease. This is thought to be due to an alteration in the immunological status of the patient. Reactions are the major cause of nerve damage and disability in leprosy. Therefore, these should be detected early and treated promptly.

Reactions commonly occur during the early part of the disease. Occasionally a patient may report for the first time to the centre just with reaction. Sometimes reactions are seen after the completion of treatment. The occurrence of leprosy reactions does not mean that MDT drugs are not being helpful and therefore MDT should not be suspended during reaction. Reactions are part of the natural course of the disease and can occur frequently and be severely damaging in untreated leprosy. Treatment with MDT significantly reduces the frequency and severity of reactions. Possible occurrence of reactions needs to be explained to the patients, since signs and symptoms of reactions could be misunderstood by them as adverse effects due to the drugs, or might persuade them to think that the treatment they are getting is harming them.

### **Reversal reaction or Type 1 reaction**

The most important type of reaction is known as reversal reaction. This may occur in both MB and PB leprosy. The patient may present with one or more of the following features:

- skin lesions become reddish and swollen
- painful, tender and swollen peripheral nerves

- signs of nerve damage - loss of sensation and muscle weakness
- fever and malaise
- hands and feet may be swollen
- rarely, new skin lesions may appear.

### **Treatment of reversal reaction**

The diagnosis and treatment of reversal reaction is **urgent** because of the risk of permanent damage to the peripheral nerve trunks.

If there is no nerve involvement, i.e. no pain/tenderness or swelling and loss of sensation and weakness of muscles, the reaction can be controlled by rest and analgesics (aspirin or paracetamol).

**During reversal reaction continue MDT without interruption along with anti-reaction treatment.**

If there is nerve involvement, this is a severe reaction and will need, in addition to rest and analgesics, corticosteroids such as prednisolone, given as tablets, by mouth. The daily dose of prednisolone should not exceed 1 mg per Kg body weight. For example the **maximum** dose for an adult weighing 60 Kg should not be more than 60 mg per day. Tablets of prednisolone are commonly available as 5 mg tablets.

**A suggested course of prednisolone for an adult patient is as follows:**

40 mg once a day for the first 2 weeks, then  
30 mg once a day for weeks 3 and 4  
20 mg once a day for weeks 5 and 6  
15 mg once a day for weeks 7 and 8  
10 mg once a day for weeks 9 and 10, and  
5 mg once a day for weeks 11 and 12.

In the presence of severe nerve pain and/or sudden motor paralysis, it is recommended to start with the maximum dose (60 mg a day) and then taper off as shown above (5-10 mg every 2 weeks ). Additionally, it is important to provide rest to the affected nerve until symptoms clear by applying a padded splint or any suitable alternative material to immobilize the joint/s near the affected nerve. The aim is to maintain the limb and affected nerve in the resting position to reduce pain and swelling and prevent worsening of nerve damage.

In case of a severe reversal reaction not responding to treatment after 4 weeks of treatment with prednisolone or at any time showing signs of worsening, the patient should be referred to the nearest referral centre.

Reversal reactions in some instances may occur after completion of treatment. The management of these is the same as mentioned above. In such cases patients should be reassured that reactions do not mean that the disease is relapsing.

## **ENL reaction (Erythema Nodosum Leprosum) or Type 2 reaction**

ENL is another type of reaction and occurs only in MB cases. The main features are:

- tender reddish skin nodules
- fever, joint pain and malaise
- occasionally painful and swollen nerves
- and eye involvement may occur .

### **Treatment of ENL reaction**

- For mild reactions, bed rest and paracetamol or aspirin are sufficient.
- In case of nerve involvement, treatment with prednisolone should be started immediately, as described under reversal reaction. Bed rest and immobilization of the affected nerve will minimize damage to the nerves.

During ENL reaction, continue MDT without interruption along with anti-reaction treatment.

In the case of a severe ENL reaction not responding after 4 weeks of treatment or at any time showing signs of worsening, the patient should be referred to the nearest referral centre where other drugs such as thalidomide may be used. Thalidomide, although very effective against ENL reaction, can be given only under strict medical supervision and should never be administered to women of child-bearing age in view of its potential to cause damage to the embryo.

Patients may present with eye problems during ENL reaction. This is commonly known as iridocyclitis, affecting the internal structures of the eye. The main features are pain, redness and watering of the eyes. Mild cases may be treated in the centre with topical application of atropine and steroid eye drops or ointments. More severe cases should be referred to the nearest hospital.

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## PATIENT CARE AND REFERRAL ACTIVITIES FOR DISABILITY PREVENTION AND MANAGEMENT

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### PATIENTS AT RISK OF DEVELOPING NERVE DAMAGE

Patients reporting late for diagnosis and not taking treatment with MDT are likely to be at high risk of developing nerve damage. However, others presenting with leprosy reaction, mainly those with reversal reactions, patients with multiple skin lesions and patients with painful or tender or enlarged nerves are also at risk.

### HOW TO DETECT NERVE DAMAGE?

Nerve damage is presented mainly by nerve pain, loss of sensation and loss of muscle strength. The patient will be the first to notice any changes in sensation or muscle strength. He/she may present with complaints of nerve pain or with painless wounds, blisters or simply with an area where sensation has been lost. He/she may also complain of difficulty in performing simple tasks like buttoning a shirt, holding a pen or picking up small objects, or difficulty in walking. All such complaints must be thoroughly investigated by taking a careful history about the nature and duration of the complaint, since early treatment can correct or at least prevent further damage.

## PREVENTION OF DISABILITIES

The best way to prevent disabilities is:

**Early diagnosis and prompt treatment with MDT.**

The next step:

To recognize signs and symptoms of leprosy reactions with nerve involvement, and start treatment with prednisolone as quickly as possible.

If sensory loss is present, simple measures can be taught to patients, so that they can protect themselves against injuries. Some examples of these are: use of shoes to protect insensitive feet, use of gloves while working with sharp and hot objects, and use of goggles to protect eyes against dust. Although very little can be done to improve established or longstanding disabilities, simple daily exercises have proved to be effective in keeping the skin supple, joints mobile and restoring muscle strength in cases with partial paralysis. The key to preventing disabilities is to promote changes in the patients' behaviour with regard to specific activities in their daily lives. This task involves establishing a good rapport with the patients and their family members, so that patients with problems will report promptly to the health centre.

## **GRADING OF DISABILITIES HANDS AND FEET**

Grade 0: no anaesthesia, no visible deformity or damage.

Grade 1: anaesthesia present, but no visible deformity or damage.

Grade 2: visible deformity or damage present.

Each hand and foot should be assessed and graded separately. "Damage" in this context includes ulceration, shortening, disorganization, stiffness, or loss of part or all of the hand or foot. If any disability found in the patient is due to causes other than leprosy, this fact should be noted.

### **EYES**

Grade 0: no eye problems due to leprosy; no evidence of visual loss.

Grade 1: eye problem due to leprosy present, but vision not severely affected as a result (vision 6/60 or better; can count fingers at six metres).

Grade 2: severe visual impairment (vision worse than 6/60; inability to count fingers at six metres).

Eye problems due to leprosy include corneal anaesthesia, lagophthalmos, and iridocyclitis.

Each eye should be assessed and classified separately.

If any disability found is due to any cause other than leprosy, this fact should be noted.

### **OVERALL GRADING OF THE PATIENT**

It will often be necessary to provide information on an overall disability grading for the patient. In such cases, the highest value of the leprosy disability grade for any part should be taken as the overall disability grading of the patient.

## COMMON PROBLEMS AND ACTION TO BE TAKEN

	PROBLEM	ACTION TO BE TAKEN
<b>DIAGNOSIS</b>	<p>1) If the individual has:</p> <p>a) skin patch consistent with leprosy with no other evidence, or</p> <p>b) sensory loss in the skin with no patch or other evidence, or</p> <p>c) nerve thickening with no other evidence</p>	<p>1) Refer for confirmation or otherwise of diagnosis</p>
<b>CLASSIFICATION</b>	<p>1) If a diagnosed case has more than 5 patches</p> <p>2) If a diagnosed case has 5 or fewer patches</p>	<p>1) Classify as MB and treat</p> <p>2) Classify as PB and treat.</p>
<b>TREATMENT</b>	<p>1) Patient refuses to take clofazimine because of skin discolouration</p> <p>2) Patient complains of dryness of the skin</p> <p>3) If a patient presents with severe illness including jaundice, skin rashes, anaemia or other systemic problems</p>	<p>1) Explain that discolouration will reverse within a few months after completion of MDT</p> <p>2) Teach patient to regularly soak the affected parts with water and apply vaseline</p> <p>3) It is likely to be severe allergic reaction to either dapsone or rifampicin. Stop treatment and refer immediately to a hospital</p>

- |   |   |
|---|---|
| 4) If you diagnose a case of leprosy also having severe liver or kidney disease | 4) Refer the patient to the hospital for appropriate investigations and treatment including treatment of leprosy                |
| 5) A patient having tuberculosis is diagnosed as also having leprosy            | 5) Maintain treatment for TB and start appropriate MDT regimen, rifampicin should be used in the standard dose for TB treatment |
| 6) A pregnant woman is diagnosed as having leprosy                              | 6) Start appropriate MDT regimen. MDT is considered safe for both mother and child  |
| 7) A patient unable to take MDT due to severe side-effects to one or more drugs | 7) Send patient to a referral centre for investigation and alternate treatment, if necessary                                    |

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**LEPROSY REACTIONS**

- |  |   |
|--|---|
| 1) A patient presents with swollen and severely painful and tender nerves, and complains of muscle weakness          | 1) This is a case of acute neuritis. Treat with analgesics and prednisolone. Rest the affected limb. If you do not have facilities, refer to the hospital |
| 2) A patient with acute neuritis does not show satisfactory improvement after 4 weeks of treatment with prednisolone | 2) Refer  |
| 3) A patient with chronic and untreatable nerve pain with established paralysis                                      | 3) Refer  |
| 4) A patient showing severe ENL or reversal reaction   | 4) Refer to hospital  |
-

**CARE OF EYES**

- |   |  |
|---|--|
| 1) Patient cannot close eye lids properly (lagophthalmos)   | 1) Treat with a course of prednisolone, if the episode is acute or recent (less than 6 months); teach blinking exercise, advise use of dark glasses and advise eye ointment to prevent drying. If the condition has existed for a long time, refer |
| 2) Patient presents with red eye, blurring of vision, discharge and photophobia (acute iridocyclitis) | 2) This happens sometimes as part of ENL reaction. Give aspirin, put in 1% atropine drops and steroid ointment, cover eye and refer  |
| 3) Patient showing corneal ulcer  | 3) Apply antibiotic ointment, cover eye and refer  |
| 4) Patient with opacity of lens (cataract)  | 4) Refer   |
| 5) Sudden change in visual acuity   | 5) Refer   |

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**CARE OF HANDS**

- |   |   |
|---|---|
| 1) Patient with injury on hand                      | 1) Clean wound and apply clean dressing. Advise rest or immobilize affected part with a simple splint. Teach how to protect hands |
| 2) Patient with dry cracks and fissures             | 2) Teach patient to soak hands and apply vaseline regularly   |
| 3) Patient with stiff joints                        | 3) Teach exercises and advise massaging with vaseline   |
| 4) Patient with burn injuries caused whilst cooking | 4) Apply clean dressing. Advise use of gloves and cooking pots with wooden handles  |
-

## CARE OF FEET

- |   |  |
|---|--|
| 1) Patient with dry cracks and fissures                     | 1) Teach patient to soak feet and apply vaseline regularly   |
| 2) Patient with blister on the sole or between toes         | 2) Dress blister with clean cloth. Apply cotton wool and bandage. Advise rest, elevate limb. If needed, advise use of crutches for walking |
| 3) Patient with shallow or deep ulcer without any discharge | 3) Clean the ulcer with soap and water. Cover with antiseptic dressing. Advise rest and use of appropriate footwear                        |
| 4) A case of deep ulcer with discharge                      | 4) Clean the ulcer. Apply antiseptic dressing. Advise rest. If no improvement in 4 weeks, refer  |
| 5) If a patient develops foot drop suddenly                 | 5) Advise bed rest. Give a full course of prednisolone. If no improvement, refer   |
| 6) A case of foot drop not recovered after 6 months or more | 6) Refer   |
| 7) A case with swollen and warm foot and fever              | 7) Refer   |
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## ORGANIZING MDT SERVICES

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The main objective is to make MDT drugs accessible to **ALL** leprosy patients in the area. All existing health centres should be able to provide this service for patients residing in their area.

Once MDT services are made available and community awareness created, most new and old patients will report on their own to the health centre.

### Step 1

**Updating registers:** This involves checking the existing treatment registers in order to remove from the register those who are known to have dropped out due to death or migration. Where information is not known, a visit should be made to the homes of patients who were not seen during the past 12 months or more.

### Step 2

**Screening patients:** All registered patients should be examined and assessed to determine who will require MDT. All previously dapsone-treated patients classified as MB should be selected to receive a course of MDT for MB disease. All PB patients should be assessed for the presence of active lesions, and if not should be removed from the register as cured. *In case of doubt, treat all dapsone-treated patients with appropriate MDT regimen.*

### Step 3

**Selecting MDT regimen:** All patients classified as MB should receive MDT regimen for MB leprosy, and PB patients should receive MDT regimen for PB leprosy. If new patients are diagnosed, they should receive MDT regimen determined by clinical classification.

## Step 4

**Preparing treatment register:** The treatment register should contain names of all patients who require treatment with MDT. In addition to the name it should include, classification of leprosy, date/month of starting MDT, 6 or 24 columns for monthly doses for PB or MB, and a column for remarks. A separate register each for PB and MB may be more convenient. Every month these registers should be checked to identify absentees and efforts made to bring them back for treatment. In addition, patients who complete the required number of doses (6 in 9 months for PB and 24 in 36 months for MB) should be **immediately** removed from the registers as cured. The column for remarks may be used to describe any unusual events such as leprosy reactions, side-effects, etc.

## Step 5

### Delivering MDT to patients:

- inform the community about the availability of MDT services;
- publicize the curability of leprosy with MDT;
- inform people that treatment is **free of cost**;
- start appropriate treatment as soon as possible;
- explain about monthly and daily treatment and duration of treatment;
- give sufficient supply of MDT to last until the next visit;
- explain common complications and side-effects and ask them to report immediately if necessary.

Every leprosy patient living in your area, who requires treatment, should receive treatment with MDT regimen.

## Step 6

### Managing MDT supply:

1. **Estimating MDT requirements:** MDT is now available to all patients in blister packs. Each pack contains four weeks' supply of either MB or PB regimen. The estimate should include at least 6 months' supply of MDT for:
  - i) the registered number of MB and PB patients, plus
  - ii) the estimated number of new MB and PB patients likely to be detected during the next 6 months, plus
  - iii) an additional 10% to cover damage, loss or extra demand.
2. **Procuring:** It is better to order new supplies well in advance. Some buffer or extra stock is useful, in case there is delay in receiving fresh supplies. The amount to be kept as buffer stock will depend on the communication and transport facilities available in the area. Always replace the buffer stock with part of the fresh supply and use the old stock. **Every health centre in an endemic country should have MDT drugs available, including those with no case of leprosy yet registered.**

Maintaining an uninterrupted supply of MDT drugs is vital to sustain effectiveness of the Leprosy Elimination Programme in the area.

3. **Storage:** MDT drugs supplied as blister-packs are well protected, however, keep packs in a cupboard or a wooden box.
4. **Shelf-life:** The shelf-life for MDT blister-packs or individual drugs is about 3 years. This is usually marked on the pack by the manufacturer. **Do not use drugs beyond the date of expiry.**

- 5. Keeping records:** It is very important to keep a simple register to record the drugs received and distributed, and the remaining balance. Regular and uninterrupted supply of drugs is very important for MDT programmes.

### **Special drugs**

At least one special drug will be needed to cope with leprosy reactions, i.e. prednisolone. For the course of treatment suggested on page 38, you will need 336 tablets of prednisolone 5 mg. A stock of 2000 tablet per 100 patients may be sufficient to start with.

### Special situations and solutions

The main objective of the programme should be to extend MDT services to all patients. It will be relatively easy to put most of the patients on treatment. However, for some patients this may be difficult because of distance, social problems, different life-style, or due to lack of trust in the services. Some of these problems have already been discussed, and it is not possible to list all problems and suggest solutions, as these will depend on the local situation and will differ from patient to patient. However, in discussion with the patient, his/her family and the community, innovative and flexible approaches may be found to solve most of these problems.

Problem	Action to be taken
1. MDT blister packs for a child case not available	Remove tablets from an adult pack and give appropriate dose, explain to parents
2. Drugs are damaged or have changed colour or capsule is broken	Do not use damaged drugs, use new pack
3. The expiry date is past	Do not use the pack, use new pack
4. Shortage of drugs	Avoid such a situation by keeping a buffer stock and order in advance. Request nearby centre for temporary supply
5. Patients living in difficult-to-access area	Arrange a visit to the place, assess patients, explain how to use MDT, supply a full course of regimen. Ask a community or family member to supervise
6. Health centre closes during rainy season	Provide enough supply to all patients to cover the period

## ASSESSING PROGRESS WITH MDT IMPLEMENTATION

Some indicators:

1. MDT coverage (patients): This is the proportion of patients receiving MDT among all patients on the register at any given time. This is usually expressed as a percentage. For example:

Total patients on the register on 31st December.....	70
Patients receiving MDT on 31st December.....	65
MDT coverage on 31st December.....	92.86%

2. Cured with MDT: This is the cumulative number of patients who have completed MDT since the implementation of the programme. This is expressed as absolute numbers. For example:

Year of starting MDT programme: 1991

Cured with MDT up to 31st December 1995: This is the sum of patients cured in 1991 + 1992 + 1993 + 1994 + 1995.

3. Defaulters: This is the absolute number of patients who were removed from the treatment registers as defaulters (did not collect MDT for 12 consecutive months) during a given period of time.
4. MDT drug utilization: This is the proportion of MDT blister packs used during a given period out of the total amount received for the same period. For example: for MB leprosy patients:

Total number of MB-MDT packs received during the year 1995:.....	1200
Number of MB-MDT packs used during the year 1995:.....	600
MB-MDT pack utilization rate:.....	50%

### PATIENT CARD (Sample)

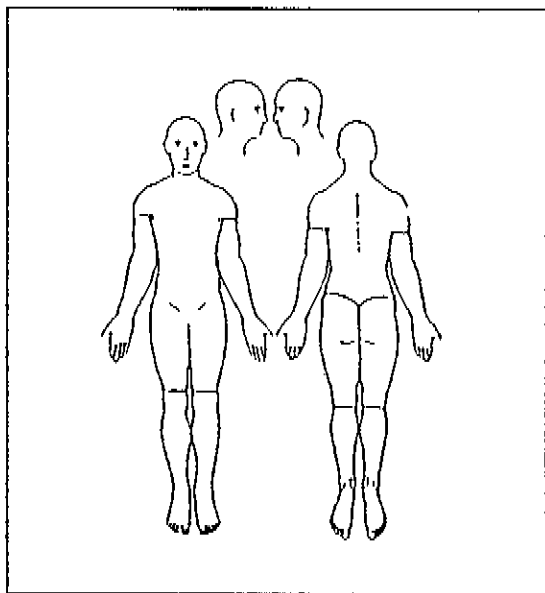
**IDENTIFICATION DATA:** *(name, address, age, etc.)*

Number of skin lesions

Bacteriological examination	Not done	Result
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Classification	PB	MB
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Date of detection	<input type="text"/>
Date of starting MDT	<input type="text"/>



### Treatment

Dose	1	2	3	4	5	6	PB
	7	8	9	10	11	12	
Date	13	14	15	16	17	18	MB
	19	20	21	22	23	24	

Date of cure	<input type="text"/>	
Cured	Without disabilities grade 2	With disabilities grade 2

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## SELECTED READING MATERIAL

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1. Chemotherapy of Leprosy for Control Programmes. Report of a WHO Study Group, TRS 675, 1982.
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4. Report of the International Conference on the Elimination of Leprosy as a Public Health Problem. Hanoi, Viet Nam, 4-7 July 1994.
5. Risk of Relapse in Leprosy. WHO/CTD/LEP/94.1
6. WHO Weekly Epidemiological Record, June 1995.
7. Global Strategy for the Elimination of Leprosy as a Public Health Problem. WHO/CTD/LEP/94.2.
8. A Guide to Leprosy Control. Second Edition, WHO, Geneva, 1988.
9. Managing Programmes for Leprosy Control. WHO Training Modules, 1993.
10. Prevention of disabilities in patients with leprosy. A practical Guide. WHO, Geneva, 1993.
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12. MDT - Questions and Answers. WHO/CTD/LEP/91.3.
13. Prevention of Blindness in Leprosy. Revised Edition. The International Centre for Eye Health, London, 1991.
14. On Being in Charge - A guide to management in primary health care. Second Edition, WHO, Geneva, 1992.
15. Leprosy. Edited by Hastings, R.C., Churchill Livingstone, Edinburgh, Second Edition 1994.