सत्यमेव जयते

TRAINING MANUAL FOR MEDICAL OFFICERS

National Leprosy Eradication Programme

Directorate General of Health Services
Ministry of Health & Family Welfare
Nirman Bhawan, New Delhi

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Directorate General of Health Services
Ministry of Health & Family Welfare
Government of India

सत्यमेव जयते

Dr. R. K. Srivastava
Director General of Health Services

FOREWORD

I am happy to learn that the Central Leprosy Division has for the first time prepared a detailed training manual for the Medical Officers working under the Primary Health Care system, to train them on the National Leprosy Eradication Programme. The manual prepared in consultation with the experts from partner organisations like the WHO, ILEP, Novartis, and others included all the standard technical material required for training of the General Health Care Services Medical Officers.

Availability of this Training manual along with the facilitators guide prepared, should help in standardizing the training given to the Medical Officers, who in turn have to provide service to the persons affected by Leprosy and also to teach the Health Workers under him. This book also should remain as a reference material for NLEP including the recent developments after introduction of the National Rural Health Mission.

I am sure the manual will be used profitably by the Medical Personnel working in the General Health Care Services and make practical use of the same.

(Dr. R. K. Srivastava)

Dated: 2nd January, 2009

Directorate General of Health Services
Ministry of Health & Family Welfare
Government of India

सत्यमेव जयते

Dr. P. L. Joshi
Deputy Director General (Leprosy)

PREFACE

Learning material on Leprosy used for training of Medical Officers was first developed by a group of selected experts from Leprosy and General Health Care Institutions in the year 1999. The booklet was printed by the International Federation of Anti Leprosy Association (ILEP) and supplied to all the States and UTs. The booklet was again updated and modified in consultation with various experts in the years 2005, which was printed and supplied by ILEP again to all the Health Institutions.

The National Leprosy Eradication Programme has undergone various changes in its concepts and approaches over the years and particularly after the elimination of Leprosy as a public health problem was achieved in India at the National level in December 2005. Introduction of the National Rural Health Mission in India on 12th April 2005 also brought in newer challenges in integrated service delivery. Widening the scope of the Disability Prevention and Medical Rehabilitation activities under NLEP along with emphasis on behavioural change communication to reduce stigma and discrimination against the disease have increased the need to make the training material more comprehensive and yet simple to use by the General Health Care staff. In view of these requirements, it was agreed with all the partners in NLEP in India, to prepare the training Manual for the National Leprosy Eradication Programme for use by the Medical officers of the General Health Care system.

While preparing the manual it was kept in mind that this can also be used as a reference book subsequently by all persons working for the programme. A set of facilitators guide was also prepared, so that the training by different trainers can be standardized.

In preparing the manual and the facilitators guide, the Central Leprosy Division was supported with man and material by our partners WHO, ILEP, Novartis and other experts from the states. The names of the experts and the resource persons have been duly acknowledged in the manual. I would like to express my heartfelt gratitude to each of these persons and organisations for their support and contribution toward this important work. Special words of thanks are due for Dr. S.J. Habayeb the WHO Representative to India for supporting organisation of a workshop to finalize the manual.

(Dr. P. L. Joshi)
2.01.09

Dated: 2nd January, 2009

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- **Dr. P. K. Oommen,** Director, Central Leprosy Training & Research Institute, Chengalpattu
- **Dr. P. V. Ranganadha Rao,** Chief Executive Lepra India
- **Dr. Rajan Babu,** Deputy Director, The Leprosy Mission
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Dr. P. L. Joshi

National Rural Health Mission

Structure

(I) Introduction

- (a) Key features of NRHM
- (b) Objectives of NRHM
- (c) Organisational setup under NRHM

(II) Approaches under NRHM

- (a) Communitization
- (b) Flexible Financing
- (c) Improved management through capacity building
- (d) Monitor progress against standards
- (f) Innovation in human resource management

(III) Support of NRHM

Learning Objectives

At the end of the session trainees will be able to:

- ☞ **Describe the institutional mechanism available under NRHM**
- ☞ **Describe various programme activities those can be supported/integrated with NRHM**

(I) Introduction

The National Rural Health Mission was launched on 12th April 2005 throughout the country with special focus on 18 states. NRHM was launched with a view to bring about dramatic improvement in the health system and the health status of the people, especially living in the rural areas.

(a) The key features of NRHM include

- Making health delivery system fully functional & accountable to the community
- Convergence of National Health Programme at all levels of health system
- Improved management through capacity building
- Involvement of community
- Monitoring progress against standards
- Flexible financing for optimum fund utilization
- Inter-sectoral coordination for financial enhancement

(b) Objectives of NRHM

- Reduction in maternal and child mortality.
- Universal access to affordable and quality health care services.
- Prevention and control of communicable and non-communicable diseases.
- Access to integrated comprehensive primary health care.
- Population stabilization.
- Promotion of healthy life style.

(c) Organisation Setup under NRHM

The National Leprosy Eradication Programme is an integral part of NRHM. The health care delivery system under NLEP is shown below:

NLEP is an integral part of National Rural Health Mission:

Ministry of Health & Family Welfare/Directorate General of Health Services

(Central Leprosy Division)

↓

State Health Societies

↓

District Health Societies

↓

District Nucleus

↓

PHCs/CHCs

Rogi Kalyan samiti/Panchayati Raj Institution

↓

Sub-Centre

Gram Panchayat

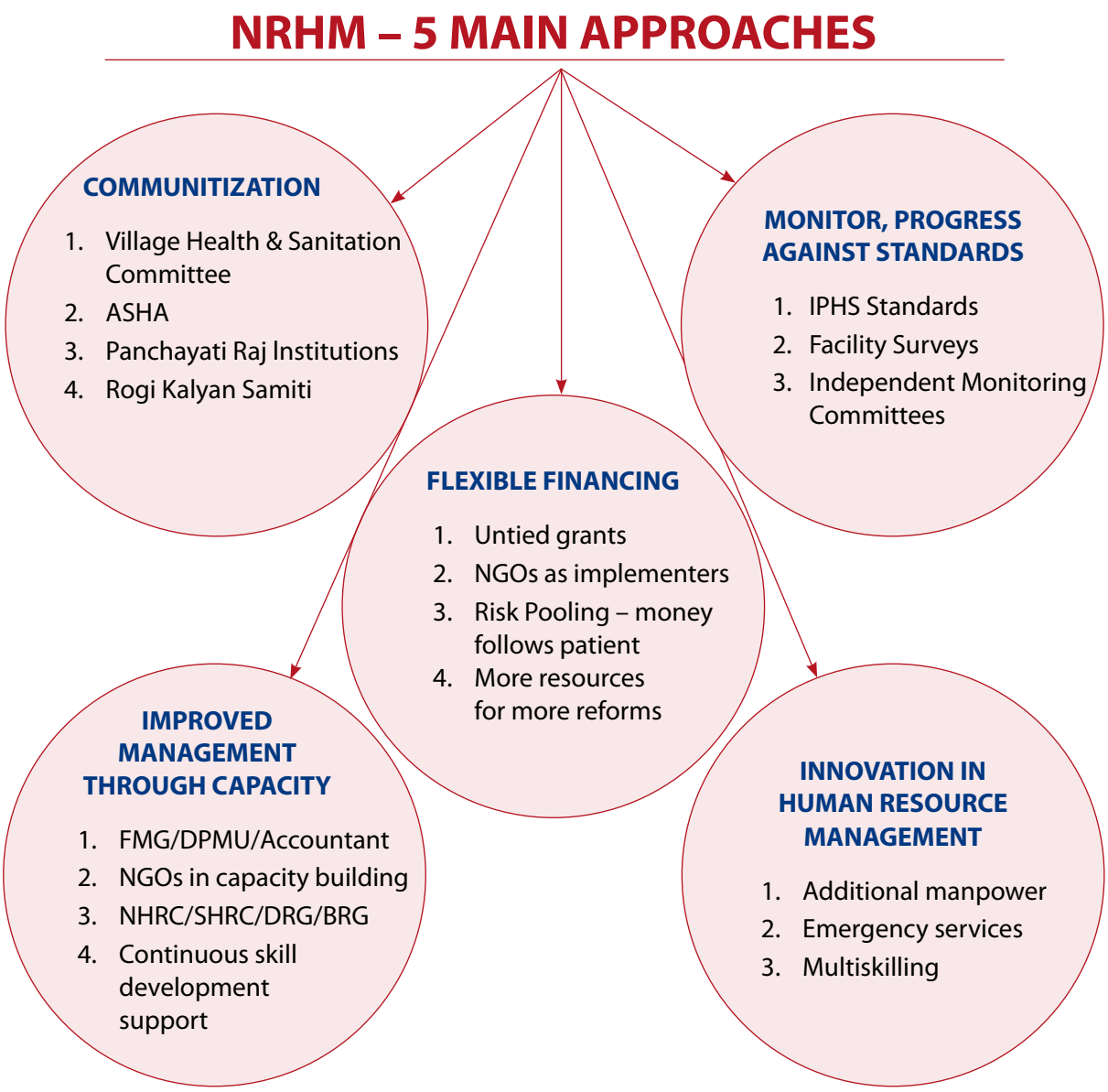
↓

Village (AWW, ASHA)

Village Health and Sanitation Committee

- The State and District Leprosy Societies have been merged with the State and District Health Societies under NRHM.
- State & District Programme Management Units (SPMU & DPMU) have also been established in States/ UTs for finance management of all health programme. The services of these units could be optimally utilized by working closely with them.

(II) Approaches under NRHM



The five main approaches under NRHM are given below –

(a) Communitization – For ensuring better community participation; committees/ organisations have been formed at various level viz. Village Health and Sanitation Committee at village level, Panchayati Raj Institutions at village/block level, Rogi Kalyan Samitis at PHC and CHC and the ASHA, a community volunteer for every village.

(b) Flexible Financing – For improved finance, the mission has brought all the schemes of health and family welfare within the overarching umbrella of NRHM. Financing through the NRHM budget head provide the much needed funds to the districts to facilitate better functioning of health programme. Based on needs of the district,

funds are allocated to states. The untied funds are also available under NRHM at various levels. The expenditure on public health has been raised from 0.9% to nearly 3% of GDP.

(c) **Improved management through capacity building–** Management skill at block, district and state levels have been increased under NRHM. Post of public health managers has been created at district level and accountant at block level for accounts work. Various NGOs are involved in capacity building and continuous skill development of health functionaries at various levels is being carried out.

(a) **Monitor progress against standards –** Progress of activities is being monitored according to the Indian Public Health Standard. Health facility surveys are conducted at regular intervals to monitor facilities available at sub-centres, PHCs and CHCs. Independent monitoring committees are also being formed to monitor progress.

(b) **Innovation in human resource management –** To increase the pool of human resource, additional manpower like nurses, MO are being provided at PHC and CHC. Local residents of remote areas are trained and developed for providing basic health services. Multiskilling of health functionaries especially of doctors and paramedics is being carried out so that a person could carryout multiple tasks.

(III) Support of NRHM

Under the NRHM, institutional mechanisms have been created at each level to support National Health Programmes and improve delivery of health care services. The programme may seek support of NRHM as below-

(a) **Village Health & Sanitation Committee** (VHSC) a multi stakeholder at village level, create public awareness about the programme and ensure community involvement. These committees analyze the health problems, decide the health priorities and take appropriate action to overcome the problems. The committees also help in managing village health funds in the village. These committees can be utilized to discuss Leprosy problem like stigma and discrimination against people affected by Leprosy and their family members and seeking collaboration from the health services.

(b) **Accredited Social Health Activist (ASHA)** is selected for every village. She is a female volunteer belonging to the same village, selected by the community. During her routine home visits, ASHA can identify/suspect cases of Leprosy and refer such cases to nearest health centre for diagnosis and treatment. ASHA can also ensure timely completion of treatment by the diagnosed Leprosy cases by conducting regular follow up of these cases. An incentive is being paid to ASHA in endemic states for referring suspect Leprosy cases to health facility and ensuring treatment completion of diagnosed cases referred by them. During her visit, ASHA can also identify ulcer patients and persons with Leprosy related disability and refer such cases to nearest health centre for further management.

(c) **Rogi Kalyan Samities** (RKS) at PHC and CHC are autonomous registered bodies constituted at each level to facilitate in day to day management of hospital activities and delivery of quality care to patients. These samities have the authority to procure medicines required for emergency conditions. Its services can be utilized for procurement of prednisolone and other supportive drugs for treatment of Leprosy reactions which is an emergency condition.

(d) **Panchayati Raj Institutions** (PRIs) also work at PHC & CHC level which can help in planning and implementing programme including IEC activities like organizing health melas, IPC workshops/meetings and orientation camps.

A single budget head for activities with separate subheads for various programme have been formed under NRHM which provide state the flexibility to direct funds

to those areas where they are needed the most. The funds flow through integrated health society at the state and district level.

The funds allocation is on the basis of integrated State/District health action plans. The district health action plans are first drawn up. Based on district plans, the state health action plan is prepared and submitted for sanction of GOI. A detailed NLEP district action plan should be drawn up with consultation and approval of district NRHM authority which would form the basis of NLEP state action plan.

(e) **Finance Management Group** (FMG) is formed under NRHM at States and Districts. Services of FMG should be utilized for release of funds from states to districts and from districts to blocks, monitor programme expenditure and maintaining programme accounts.

Untied Funds are made available under the mission at various levels which can be utilized by any programme based on the requirement. The untied funds can be utilized for providing support particularly to persons affected with Leprosy.

Chapter 1 Introduction

Leprosy is a chronic infectious disease caused by bacteria called **Mycobacterium leprae.**

It is a disease of public health concern mainly because of its potential to cause disability in a small proportion of those affected and is a cause for social stigma and discrimination.

Till the introduction of the drug Dapsone in 1940s there was no treatment for this disease; patients were kept in isolation. In 1955 the government of India launched the National Leprosy Control Programme (NLCP) with case detection, community education and treatment with Dapsone. This was changed to the National Leprosy Eradication Programme (NLEP) in 1983, with the introduction of Multidrug Therapy (MDT).

Two decades of experience with MDT has proved that:

- Leprosy is **curable.**
- MDT cures Leprosy.
- Early diagnosis and treatment prevents disability.
- Treated persons can lead a normal life.

It is essential to identify all the Leprosy cases, confirm diagnosis and register them promptly for treatment with MDT. It is possible only if good quality services are provided. **Good quality services** refer to easy accessibility and equity.

Chapter 2

Job Descriptions of Health Care Providers

Structure

2.1 Introduction

2.2 Job Responsibilities Related to Leprosy

2.2.1 Medical Officer

2.2.2 Health Supervisor/Health Assistant

2.2.3 Health Worker/Multipurpose Worker

2.2.4 Pharmacist

2.2.5 Accredited Social Health Activist/Anganwadi worker/other volunteers

Learning Objectives

At the end of the session trainees will be able to:

- **Enlist the job responsibilities of various health functionaries of health care team at primary level**

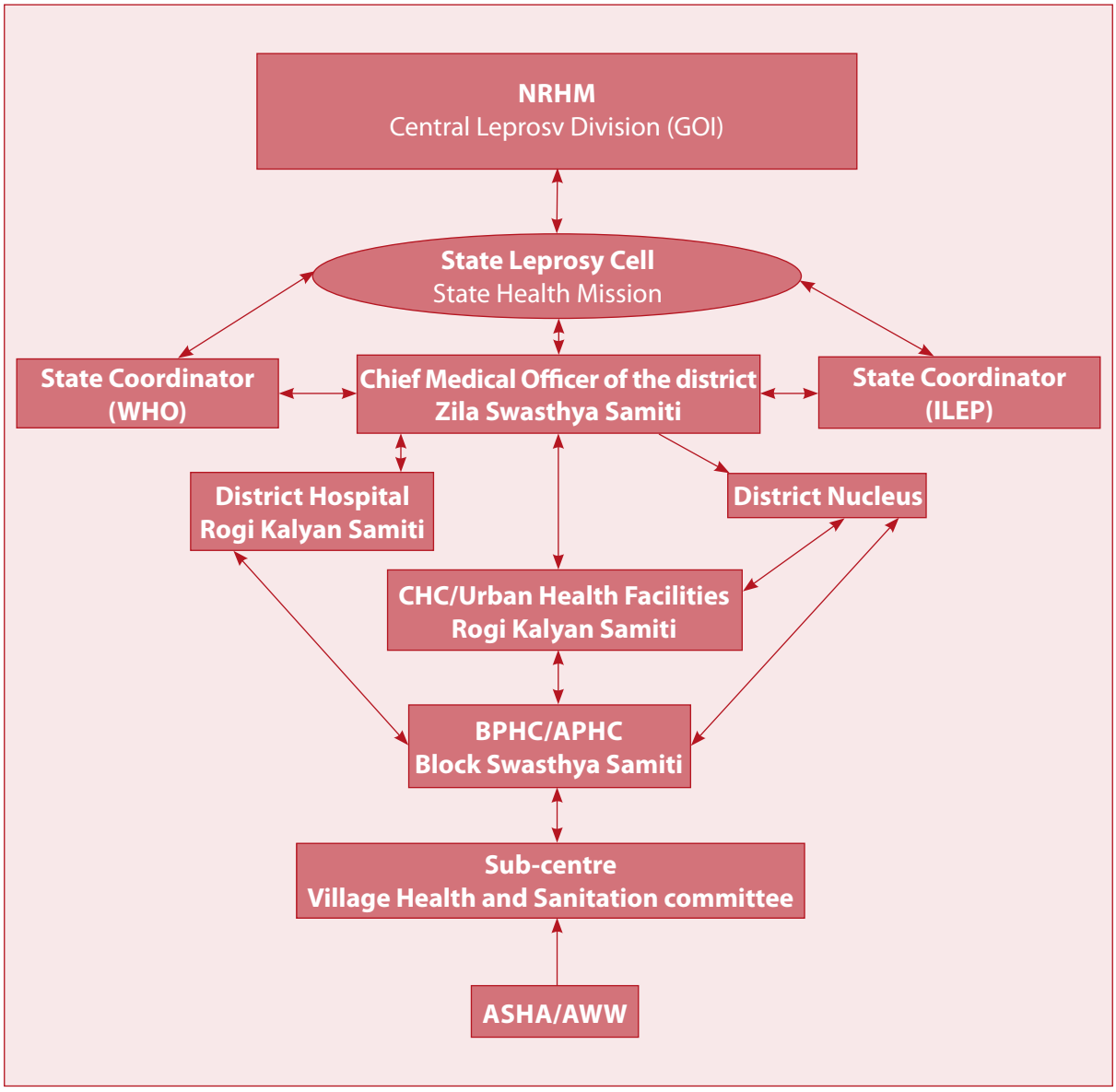
Teaching method: Lecture discussion using power-point presentation

2.1 Introduction

Health care providers can help Leprosy affected persons in many ways to enable them to lead a normal life.

It is essential to have a clear job chart for all health care providers and assign the tasks accordingly for proper implementation of the programme.

Organogramme under National Leprosy Eradication Programme



2.2 Job responsibilities related to Leprosy

2.2.1 Medical Officer

- Diagnose cases, ensure registration and management of Leprosy and its complications with due counselling.
- Plan and monitor the programme and supervise all the staff under his/her jurisdiction.
- Ensure regular updation of records, availability of adequate stock of MDT, Prednisolone, other supportive drugs and materials and timely submission of reports.

- Ensure co-ordination with District Level Programme Officers, NRHM institutions including Village Health and Sanitation Committees, Panchayati Raj Institutions and other community level functionaries.

2.2.2 Health Supervisor/ Health Assistant

- Supervise all the staff under his/her jurisdiction for Leprosy related activities.
- Ensure that the health staff manages the patients adequately including absentee/default retrieval.
- Maintain necessary records, generate and submit the reports on time.
- Co-ordination with Village Health and Sanitation Committees, Panchayati Raj Institutions and other community level functionaries.

2.2.3 Health Worker/Multipurpose Worker

- Impart Health Education on Leprosy and its treatment to the community.
- Suspect new cases of Leprosy and those with complications and refer them to PHC.
- Provide subsequent doses of MDT to patients ensure regularity and completion of treatment and assist health supervisor in retrieval of absentee/defaulter.
- Update the case cards at sub-centres and treatment register at sector PHC.
- Assist Leprosy disabled people in self care practices, monitor them and refer them to PHC when ever required.

2.2.4 Pharmacist

- Maintain the stock ledger for MDT blister packs and other supportive drugs.
- Indent MDT as required, store it appropriately and assist the health supervisors in preparing reports.
- Delivery of MDT blister pack to patients with appropriate information.
- Supply of MDT to health facilities/health workers.

2.2.5 Accredited Social Health Activist/Anganwadi worker/other volunteers

- Generate awareness to reduce stigma and encourage self reporting.
- Identify/suspect a Leprosy affected person/its complications and refer him to Health centre.
- Help health worker ensuring regularity and completion of treatment.
- Encourage Leprosy affected person to take treatment regularly and complete the treatment.
- Encourage Leprosy disabled person to practice self care (as advised by doctor/Health worker) to prevent deformity.

Chapter 3

Epidemiology of Leprosy

Structure

3.1 Introduction

3.2 Distribution of Leprosy

3.2.1 Global Scenario

3.2.2 Scenario in India

3.3 Determinants of Leprosy

3.3.1 Agent

3.3.2 Host factors

3.3.3 Socio-Economic Factors

3.4 Control of Leprosy

Learning Objectives

At the end of the session trainees will be able to:

- **Describe current situation of Leprosy: Global/India/ respective state/district**
- **Describe determinants of Leprosy**

Teaching method: Lecture Discussion using power-point presentation

3.1 Introduction

Epidemiology is the study of distribution and determinants of the disease (Leprosy) in a specified population (i.e., population covered by the health centre) and to apply this knowledge for the control of that disease.

3.2 Distribution of Leprosy

3.2.1 Global Scenario

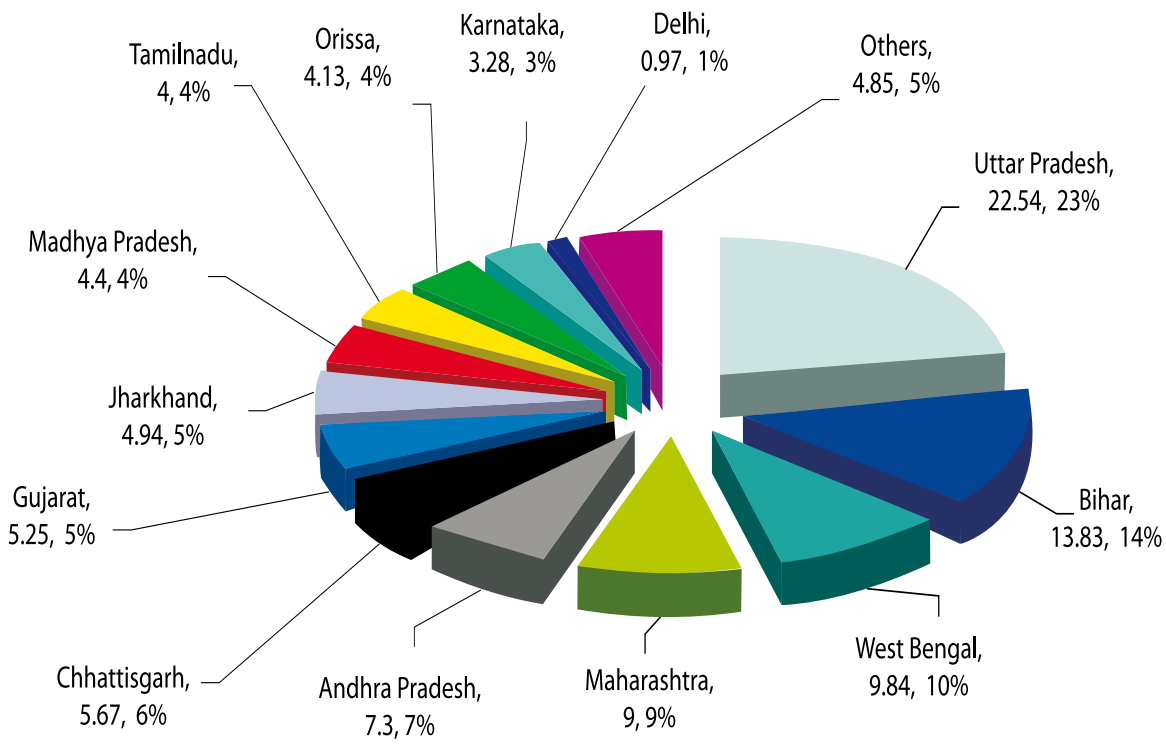
Since the introduction of multi-drug therapy as treatment for Leprosy; Leprosy case load has declined. The country achieved elimination (number of cases less than 1 per 10,000 populations) in December 2005. Of the 254525 new Leprosy cases detected globally during the year 2007-08; **137685** (54%) were from India.

The global Grade 2 Disability load in the year 2007-08 was 14033. This was reported from 133 countries. In India, load of grade 2 disability was 3477 during the same reporting period.

3.2.2 Scenario in India

As on 1st April 2008 the disease burden on record was 87228 cases of Leprosy. During the year 2007-08 **137685** new cases were detected. State wise distribution of new cases is given below (Fig. 3.1).

Fig. 3.1 State wise Contribution
New Leprosy Cases - YEAR 2008



Contribution by six states 20.8% pop and 34.5% newly detected cases of Leprosy

3.3 Determinants of Leprosy

Like any other communicable disease, transmission of Leprosy from source of infection to susceptible host is determined by a number of factors related to agent, host and environment.

3.3.1 Agent

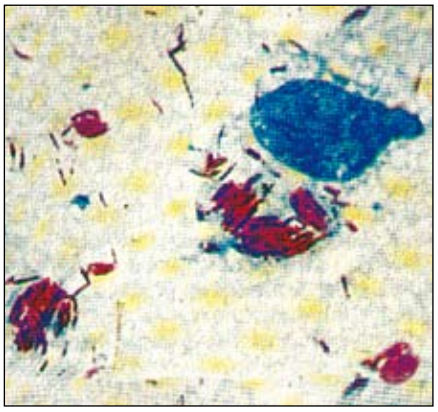


Fig. 3.2 M. Leprae, singly and in globi

- Leprosy is caused by **Mycobacterium leprae** (Fig. 3.2) intracellular, obligatory parasite.
  - It is a slow growing bacillus and one Leprosy bacillus takes 12–14 days to divide in to two.
  - It is an acid-fast bacillus and is stained red by a dye called carbol fuschin.
- **Source of infection:** Untreated Leprosy affected person (Human beings) is the only known source for M leprae.
- **Portal of exit:** The major sites from which bacilli escape from the body of an infectious patient is respiratory tract especially nose. Only small proportion of those suffering from Leprosy can transmit infection.
- **Transmission of infection:** Leprosy is transmitted from untreated Leprosy affected person to a susceptible person through droplets, mainly via the respiratory tract.
- **Portal of entry:** Respiratory route appears to be the most probable route of entry for the bacilli.
- **Incubation period:** Incubation period (Duration from time of entry of the organism in the body to appearance of first clinical sign and symptom) for Leprosy is variable from few weeks to even 20 years. The average incubation period for the disease is said to be 5–7 years.

3.3.2 Host factors

- **Age:** Leprosy can occur at any age but is usually seen in people between 20–30 years of age. Increased proportion of affected children in the population indicates the presence of active transmission of the disease in the community. As the disease burden declines, it is seen more in older age groups.
- **Gender:** Disease occurs in both the genders. However, males are affected more as compared to females
- **Immunity:** Occurrence of the disease depends on susceptibility/immunological status of an individual.

3.3.3 Socio-Economic Factors:

Leprosy is a disease generally associated with poverty and related factors like overcrowding. However, it may affect persons of any socioeconomic group.

3.4 Control of Leprosy

The only available effective method to reduce the burden of Leprosy in the community is to reduce the source of infection through MDT. The corner stone for control of Leprosy is early diagnosis and treatment.

Services for control of Leprosy are provided under National Leprosy Eradication Programme. For details of the programme and referral system under the programme; please refer Annexure-I & II.

Salient points:

1. **Leprosy is a chronic infectious disease caused by Mycobacterium leprae**
2. **The disease is all the more important because it may produce disability, the main cause for stigma**
3. **Only a small proportion of those infected may develop the disease**
4. **The bacteria enter and exit the body through upper respiratory tract**
5. **The incubation period is long and variable (average 5–7 years)**

Chapter 4

Natural History of the Leprosy

4.1 Natural history of Leprosy

Learning Objectives

At the end of the session trainees will be able to:

- **Describe the natural history of the disease**

Teaching method: Lecture Discussion using power-point presentation

4.1 Natural history of Leprosy

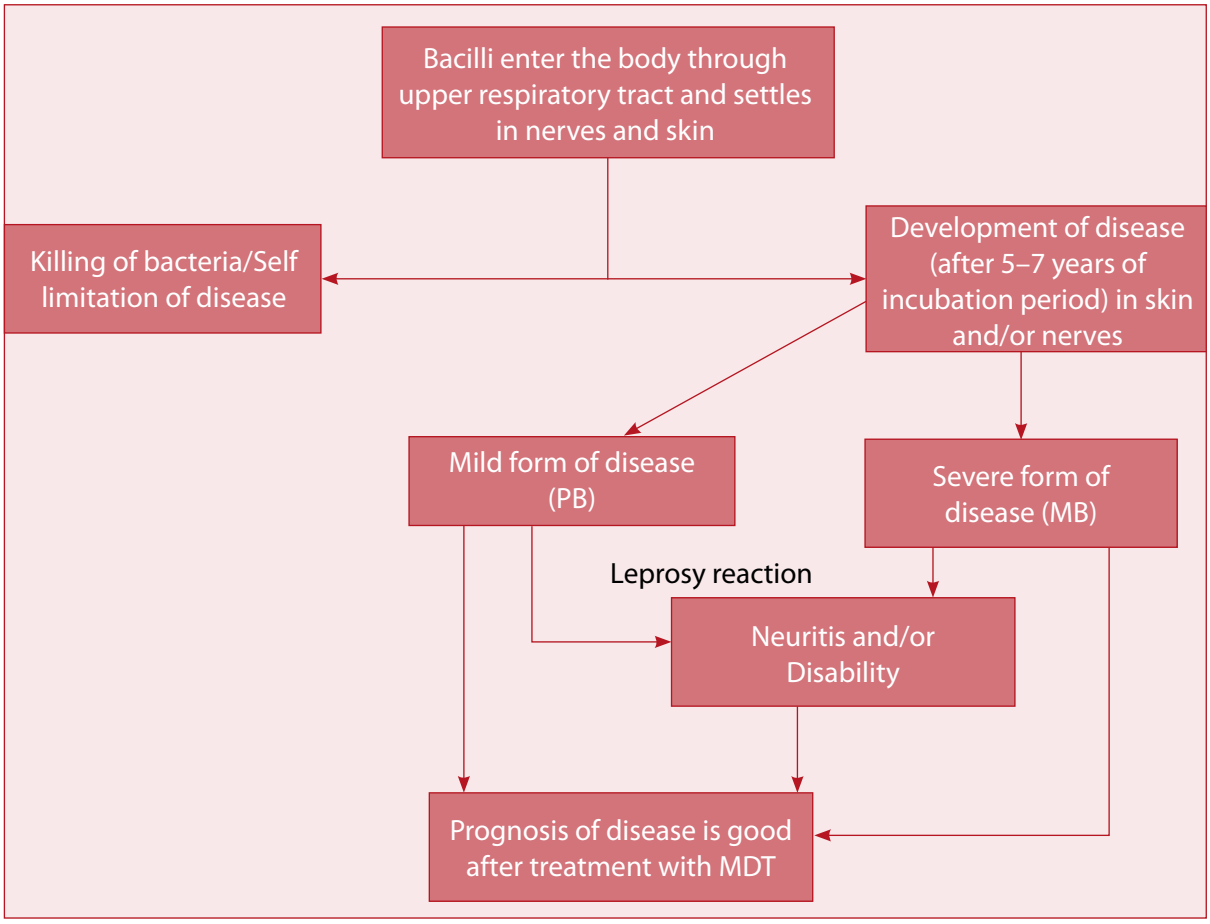


Fig. 4.1 Natural History of Leprosy

Onset of Leprosy is insidious. It usually affects nerves and skin but can affect any part of the body except central nervous system. Bacilli enter the body through upper respiratory tract. The bacilli have affinity for cooler parts of the body like peripheral nerves and skin.

Only a small proportion of infected people develop the disease. Further progress of the disease depends on the immunological status of the infected person. It may self-heal or progress to PB or MB disease. Risk for Leprosy reaction (acute inflammatory episode) and development of disability (due to nerve dysfunction) is higher in patients with MB Leprosy.

Infection may progress to disease or disease may worsen during pregnancy due to change in immunological status. Even though there is no correlation between HIV and Leprosy, lepra reaction may sometimes become more apparent in Leprosy cases co-infected with HIV and under treatment with Anti Retroviral therapy.

Prognosis of Leprosy is good if,
Detected early and treated with MDT.
Inadequate treatment leads to higher chances of developing disability.

Chapter 5

Pathogenesis of Leprosy

Structure

5.1 Introduction

5.2 Pathogenesis of Leprosy

- 5.2.1 Pathogenesis of Leprosy
- 5.2.2 Effect of strong Cell Mediated Immunity
- 5.2.3 Effect of depressed cell Mediated Immunity

5.3 Clinical presentation of the disease

- 5.3.1 Paucibacillary Leprosy
- 5.3.2 Multibacillary Leprosy

5.4 Skin lesions

- 5.4.1 Skin: Macule/ Patch/Papules/Plaques/Nodules
- 5.4.2 Mucus membrane

5.5 Involvement of nerves

- 5.5.1 Stages of involvement of nerves
- 5.5.2 Essential facts about nerve involvement in Leprosy
- 5.5.3 Commonly affected peripheral nerves

5.6. Reactions in Leprosy (Lepra Reaction)

- 5.6.1 Type 1 reaction
- 5.6.2 Type 2 reaction (Erythema Nodosum Leprosum-ENL)

5.7 Disabilities & deformities

5.8 Involvement of other tissues

5.9 Leprosy and pregnancy

5.10 Leprosy and HIV

Learning Objectives

At the end of the session trainees will be able to:

- ☞ **Discuss the effect of immunological response of host on presentation of the disease**
- ☞ **Describe clinical manifestation of the disease**

Teaching method: Lecture discussion using power-point Presentation

5.1 Introduction: M. leprae

Leprosy is caused by acid fast bacilli called Mycobacterium leprae (M. leprae), It is an obligate intracellular bacterium.

- It mainly affects nerves and skin. (only bacilli that can enter the nerve schwann cell)
- Bacilli have affinity for the cooler tissues.
- Bacterium invades either dermal (cutaneous) nerves or main peripheral nerve trunks situated superficially, in regions that are relatively cooler (face and limbs).

5.2 Pathogenesis of Leprosy

5.2.1 Pathogenesis of Leprosy

Onset of Leprosy is insidious. It affects nerves, skin and eyes. It may also affect mucosa (mouth, nose, pharynx), testes, kidney, voluntary/smooth muscles, reticulo-endothelial system and vascular endothelium.

Bacilli enter the body usually through respiratory system. It has low pathogencity, only a small proportion of infected people develop signs of the disease. Though infected, majority of the population do not develop the disease. After entering the body, bacilli migrate towards the neural tissue and enter Schwann cells. Bacteria can also be found in macrophages, muscle cells and endothelial cells of blood vessels.

After entering Schwann cells /macrophage; fate of the bacterium depends on the resistance of the infected individual towards the infecting organism. Bacilli start multiplying slowly (about 12–14 days for one bacterium to divide into two) within the cells, get liberated from the destroyed cells and enter other unaffected cells. Till this stage person remains free from signs and symptoms of Leprosy.

As the bacilli multiply, bacterial load increases in the body and infection is recognized by the immunological system. Lymphocytes and histiocytes (macrophages) invade the infected tissue. At this stage clinical manifestation may appear as involvement of nerves with impairment of sensation and/ or skin patch. If it is not diagnosed and treated in the early stages, further progress of the diseases is determined by the strength of the patient's immune response

Specific and effective cell mediated immunity (CMI) provides protection to a person against Leprosy. When specific CMI is effective in eliminating/controlling the infection in the body, lesions heal spontaneously or it produces pauci-bacillary (PB) type of Leprosy. If CMI is deficient; the disease spreads uncontrolled and produces multi bacillary (MB) Leprosy with multiple system involvement. Some times, the immune response is abruptly altered, either following treatment (MDT) or due to improvement of immunological status, which results in the inflammation of skin or/and nerves and even other tissues, called as Leprosy reaction (types 1 and 2)

5.2.2 Effect of strong cell mediated immunity

In Persons with strong cell mediated immunity (CMI) granuloma formation occurs in **cutaneous nerve.** Cutaneous nerve swell and gets destroyed. Often only a few fascicles of the nerve are infiltrated but inflammation within the epineurium causes compression and destruction of unmyelinated sensory and autonomic fibers. Myelinated motor fibers are the last to get affected producing motor impairment. Severe inflammation may result in caseous necrosis within the nerve. Clinical manifestation of sensory loss occurs when, nearly 30% of the sensory fibers are destroyed.

Good CMI may successfully limit the disease to the nerve Schwann cell resulting in occurrence of pure neural Leprosy. M. leprae may escape from nerve to adjacent skin at any time and cause **classical skin lesion(s).** Regions of the skin with relatively higher temperature such as axilla, groin, perineum and hairy scalp are usually spared.

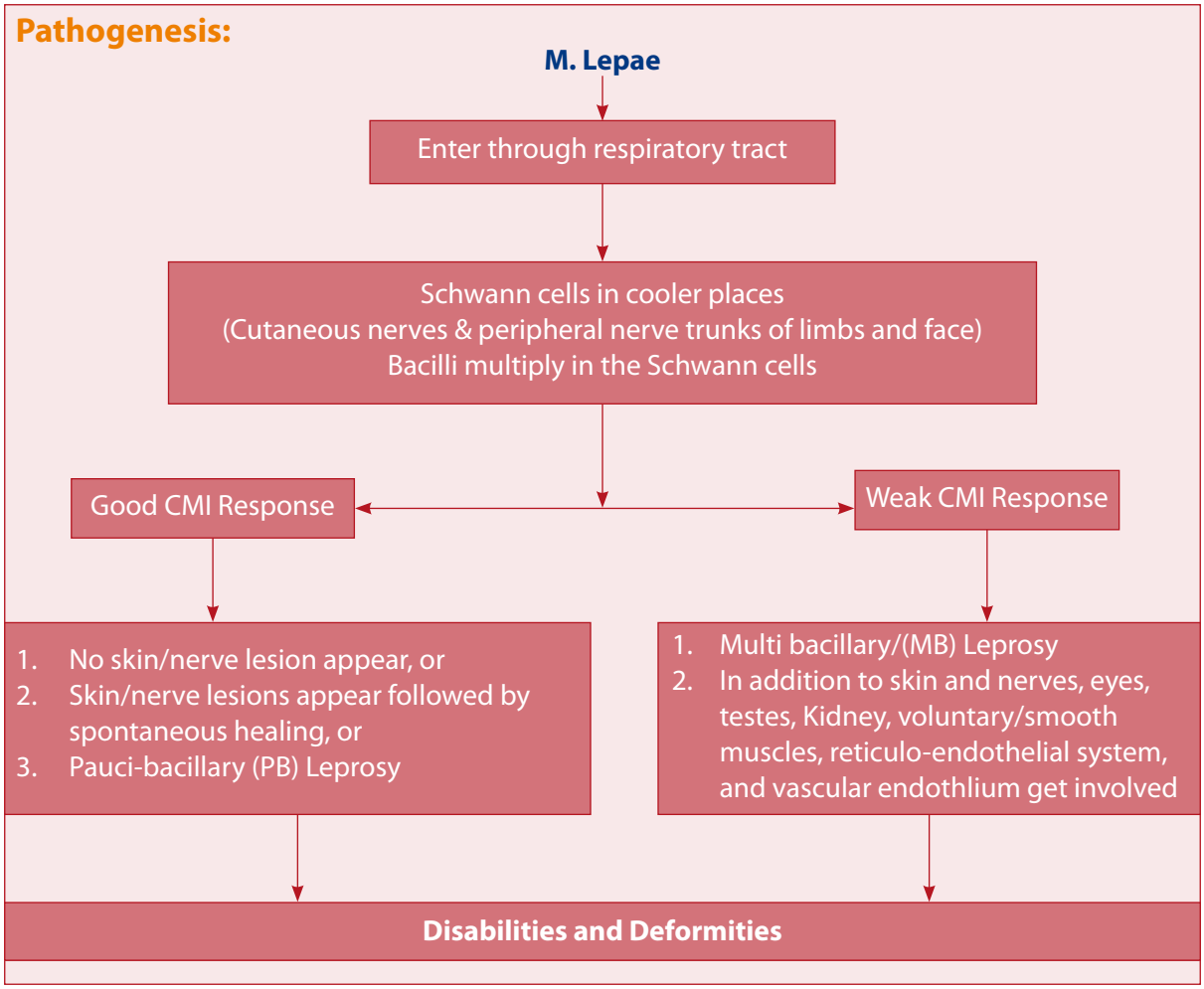


Fig. 5.1 Showing Pathogenesis of Leprosy

5.2.3 Effect of depressed Cell Mediated Immunity:

In persons with depressed CMI bacilli entering the Schwann cells multiply unchecked and destroy the nerve. Also, bacilli liberated by infected and destroyed cells are engulfed by histiocytes. Histiocytes with bacilli inside them become wandering macrophages. Bacilli multiply inside these macrophages and travel to other tissues, through blood, lymph or tissue fluid.

5.3 Clinical Presentation of the disease

Based on the two extreme type of immune responses, two polar forms (tuberculoid at one end and lepromatous at the other) of clinical presentation of the disease occur. Disease can present with clinical features representing severity, any where in the continuous/variable spectrum between these two polar forms (see Annexure No IV for an overview of Ridley and Jopling's Immunological Classification of Leprosy, in the form of a continuous spectrum). Person with "good" CMI response develops milder and localized form of the disease (Tuberculoid) with less bacterial load. Whereas, in persons with weak or absent CMI, develop disseminated wide spread disease (lepromatous) with high bacterial load. for differential diagnesis of Leprosy please rafer Annexure III.

5.3.1 Paucibacillary Leprosy

It is found in people with good CMI. The disease remains localized producing a single or few skin lesions with or with out peripheral nerve involvement. Skin lesions may be macule (flat)/papule (slightly raised) and plaque. People with strong immune response are able to destroy large number of organisms and routine skin smears are usually negative in these perons.

5.3.2 Multibacillary Leprosy

MB leprosy is found in people with poor CMI. Bacilli multiply and spread more widely resulting in a generalized disease. It usually presents with widespread lesions in the skin, nerve, and to lesser extent in other organs like eyes, respiratory mucosa, testes and reticulo-endothelial system. It usually spares the central nervous system and upper reproductive system in females.

Skin lesions may be multiple (border line) or innumerable (lepromatous). In the lepromatous form, lesions may be bilaterally symmetrical and ill defined macules or diffuse infiltration that may progress to formation of plaque and nodules. In addition, there may be nasal bleeding and oedema of both feet.

5.4 Skin Lesions

Skin lesion may be the only presenting feature of the disease and can appear any where on the body. These lesions may be present as macule (Fig 5.4), papule, plaque, infiltration (Fig. 5.2) and nodule. One or more forms of lesions may be present in the same person. Skin lesions towards tuberculoid spectrum are well defined (Fig. 5.3) and may have complete loss of sensation where as skin lesions in borderline spectrum have impaired sensations and in those towards lepromatous spectrum (Refer Annex IV) are ill defined and do not have any loss of sensation. Temperature is the first sensation that is lost followed by light touch, pain and finally deep pressure.

Fig. 5.2 Well defined raised erythematous patch

5.4.1 Macule/Patch/Papules/Plaques/Nodules

Fig. 5.3 Raised hypopigmented patch

Fig. 5.4 Raised hypopigmented patches with irregular margins

Fig. 5.5 Well defined raised hypopigmented patch with satellite lesions

Fig. 5.6 Inverted saucer type of patch with central depression

- Disease may starts with one or more, small or large characteristic hypo-pigmented patch (lighter in colour compared to surrounding skin) or erythematous macule (Flat skin lesions), with or without hyperesthesia/hypoesthesia/anaesthesia.
- Skin lesion may be pale (Fig. 5.5), coloured in dark skinned people, or reddish/erythematous (Fig 5.7) in fair skinned people, but never de-pigmented (without pigment), black or dark red in colour. Indistinct lesions become more distinct on exposure to sunlight or after exercise or hot bath.

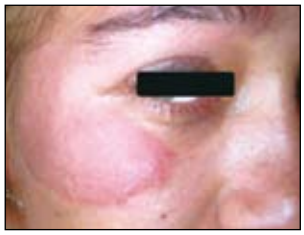


Fig. 5.7 Erythematous patch in fair skinned person

- Margins of the lesion may be well defined/partially defined/ill-defined.
- The whole patch may be uniformly thickened or there may be thicker outer zone with depressed/or less thickened central zone (central flattening).
- Patches have reduced sensation/loss of sensation for heat, touch and pain.
- Impairment/loss of sensation is most marked in the patches on the extremities and least marked on face, more marked in the centre of the lesion than at margins.
- Surface of the skin lesion may be dry, wrinkled (Fig. 5.8) and granular to shiny, soft and succulent.

- Loss of sweating (anhidrosis) due to trophic and vasomotor disturbances in the affected area may occur quite early in the disease. Icthyosis (Dryness of skin) and chronic oedema of legs (more pronounced by evening) is usually found in lepromatous Leprosy.

Fig. 5.8 Dry hypopigmented patch with ecthyosis

- Hairs on the affected skin may be sparse
- The nerve in the vicinity of the skin lesion (especially those entering the lesion) may be found palpably thickened with or without tenderness.
- Except during the recovery phase of lepra reaction, skin lesions in Leprosy are not scaly/ flaking.
- Leprosy skin lesions are never congenital or seasonal.

Fig. 5.9 Multiple plaques on face

- Without treatment, the skin lesions may increase in number and size. These lesions may merge with the normal looking skin producing diffuse infiltration which may later progress to development of innumerable, wide spread bilateral papules (raised skin lesions related to surrounding skin), plaques (Fig. 5.9) and nodules. (Fig. 5.10 & 5.11)

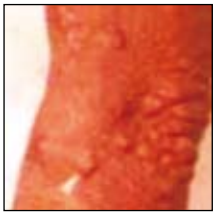


Fig. 5.10 Multiple nodular lesions on elbow

- Nodules (Fig. 5.10 to 5.12) are either skin coloured/ erythematous/ coppery or smooth shiny without loss of sensation. Nodules are firm on palpation. It may appear in the healthy skin or on top of the existing skin lesion. Nodules are most commonly seen on face, ears. It may appear on other parts of the body or on mucous membrane of nose, pharynx and larynx. These lesions are usually seen in MB patient at the lepromatous end of the spectrum (Refer Annex IV).

Fig. 5.11 Nodular Lesions on earlobe

Fig. 5.12 Erythema Nodosum Leprosum (ENL)

- Diffuse infiltrative lesion of skin (Fig. 5.13, 5.14) may appear as shiny, thickened and slightly reddish in colour. These lesions do not show loss of sensation. In such conditions diagnosis must be confirmed by skin smear test.

Fig. 5.13 Course infiltration on face

- **Leonine facies:** Lion like appearance of the face called leontiasis or leonine facies (Fig. 5.14) include the following features:
  - Infiltrative skin lesions appear on cheeks, earlobes, frontal and maxillary eminences.
  - Skin of the face becomes thickened due to infiltration and nodulation.
  - Nose becomes swollen and broadened.
  - Eye brows become thin or get completely lost.
  - Normal wrinkles on the forehead and cheeks deepen and earlobes become large and hanging.

Fig. 5.14 Course infiltration on face (Leonine facies)

- **Histoid Leproma:** A variant of MB Leprosy when few to multiple firm, erythematous, round or oval, shiny glistening, well defined or pedunculated nodules may appear on the normal skin, particularly in defaulters or partially treated patients (Fig. 5.15 to 5.18).

Fig. 5.15 Histoid lesions on face

Fig. 5.16 Histoid lesions on ear

Fig. 5.17 Histoid lesions on trunk (front)

Fig. 5.18 Histoid lesions on trunk (back)

5.4.2 Mucous membrane: Mucous membrane of upper respiratory tract from nose to larynx may get infiltrated, oedematous, thickened and may even ulcerate.

Nasal Mucosa: Respiratory system is the most probable route of entrance for M. leprae. Organism infiltrates the nasal mucousa resulting in

- **Nasal congestion** due to chronic inflammation presenting as **nasal stuffiness, crust formation** inside the nose and **blood stained discharge** from nose.
- **Anosmia** (inability to smell) may be present but persons affected by Leprosy rarely complaints of it.
- **Perforation of nasal septum: Nodules** and ulcers may appear and progress to perforation of nasal septum.
- **Saddle nose deformity** due to destruction of nasal cartilage.

Papules may appear on **lips, tongue, palate and larynx** leading to ulceration.

- Tongue may show mild glossitis or may become deeply fissured.
- Root of tongue and peritonsillar tissue may also get involved

Exclude Leprosy if, skin lesion is:

- **Present since birth**
- **De-pigmented/has de-pigmented hairs**
- **Itching is present**
- **Removable scaly/flakes present except in resolving reversal reaction**
- **Show any seasonal variation**

5.5 Involvement of nerves

Nerve involvement is much more serious and causes permanent and progressive disability and crippling deformities because neurons if destroyed do not regenerate and are replaced by fibrous tissue.

Sensory deficit in a skin lesion is diagnostic of Leprosy

Consider involvement of nerve, if any of the following is present

- **Thickening of nerve trunk**
- **Pain and tenderness in the course of the nerve**
- **Swelling (Abscess) in the course of the nerve**
- **Impairment of nerve function**

Clinical manifestation of nerve involvement can occur at any stage of the disease even after completion of the treatment with MDT.

Success of management of Leprosy lies in preserving the function of the nerves i.e.

- **Preventing new nerve damage (if nerves are normal at the time of diagnosis)**
- **Prevent further deterioration of already affected nerves**

5.5.1 Stages of involvement of nerves

There are three stages of nerve involvement

Stage I: Nerve(s) become swollen due to inflammatory response (lepra reaction/body's response for invading organism) and granuloma formation. Often only a few fascicles are infected and inflammation in the epineurium sheath causes compression of the nerve within the sheath. Nerve appears palpably thickened. Pain and tingling may be felt along the course of the nerve due to ischemia caused by compression. Nerve may become tender (painful on touch) along its course without any classical evidence of impairment. If CMI can limit the infection to the nerves, with out evidence of skin involvement, disease presents as **pure neural Leprosy.**

Stage II: Stage of nerve damage (Partial damage)

Compression of nerve trunk leads to destruction of axons due to ischemia affecting the sensory, autonomic and motor functions. Localized area of necrosis and caseation of the nerve may present as round and oval swelling in the course of the nerve indicating position of the nerve abscess (Fig 5.19, 5.20). Paralysis is either partial or complete but of recent origin i.e. not more than 6–9 month old.

Fig. 5.19 Nerve abscess (Thigh)

Fig. 5.20 Nerve abscess (Elbow)

Nerve paralysis is incomplete if:

- **Sensations are still felt in some areas of skin supplied by the affected nerve**
- **Loss of sensibility is partial, affecting only certain types of sensations (dissociated anesthesia)**
- **Some of the muscles supplied by the affected nerve are not completely paralyzed**

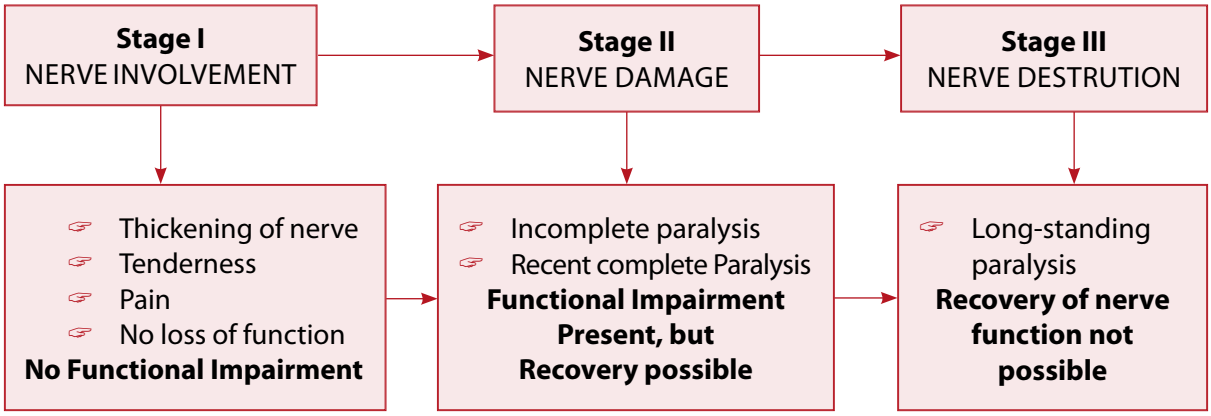
Stage III: Stage of nerve destruction

In long standing cases of nerve involvement (usually more than one year), nerve may become fibrosed, thin and atrophic.

Involved nerve is completely destroyed and its function cannot be recovered to any useful degree.

Nerve function can recover if detected and treated early

To summarize:



5.5.2 Essential facts about nerve involvement in Leprosy

- Nerves get involved either due to invasion by M. leprae or as part of lepra reaction and presents with pain and tenderness of the nerve. (Pressure on nerve produces pain which radiates towards the peripheral distribution of the nerve)
- Nerves superficial at some part of their course are more commonly affected in Leprosy.
- Affected nerve may becomes palpably thickened in its superficial course with or without pain and tenderness (if unilateral, always compare with other side)
- Presence of unusual sensation in hands and feet like tingling, numbness, burning or feeling of heaviness may be the presenting symptoms of nerve involvement during early stage.
- Acute inflammation of the affected nerve/compression of thickened nerve during the course of the disease may give rise to severe neuralgic pain.
- Sometimes, involvement of nerve results in loss of sensation and weakness of muscles without any preceding pain/tenderness – **silent Neuropathy.**
- Involvement of nerve can occur in the absence of skin lesions and is known as **pure neuritic Leprosy.**
- Most of the nerves affected in Leprosy are mixed nerves and damage to the nerve affects; sensory, autonomic and motor function of the nerve in that sequence.
- Sensory loss is more marked compared to motor dysfunction.
- When a person complaints of sensory disturbance such as paraesthesia or anaesthesia, a diligent search must be made for palpably thickened nerves responsible for sensory supply to that area (for sensory distribution see section on individual nerve).
- **Motor Impairment:** Stimulus to contract muscle travels from nerve to muscle and this moves the body part. Neural impairment of motor function results in weakness/ paralysis (lower motor neuron type of paralysis) of the muscles supplied by the affected nerve. Normally, muscles acting around a joint keep that joint in balance. Paralysis of group of muscles around the joint produces imbalance in the muscle power around it and forces the joint to take a new position which is clinically seen as deformity. (Refer Chapter 10 on P O D).
- **Autonomic function:** Impulse from nerve travels to sweat glands stimulating glands to function. Involvement of autonomic nerves may present as slight edema of hands and feet due to vasomotor disturbances. Appearance of bilateral edema of legs and ankle by end of the day may be noticed. In early stages, edema may disappear after rest at night but it may become woody with passage of time. Trophic changes in the form of loss of sweating, absence of hair and dry shiny skin are noticed in the affected area. Dryness of the skin makes it less supple and skin may crack on repeated movement of the joint.
- Insensitive skin of affected hands and feet does not register pain, burns, cuts or other wounds/injuries and hence, are often neglected. The affected area may not tolerate the usual heat due to absence of reflex dilatation of the blood vessels and may develop blisters on contact with relatively hot substances.
- Possibility of recovery of nerve function is high up to 6 months after the complete paralysis of nerve but decreases drastically thereafter especially if duration of complete nerve paralysis is one year or more. Hence, people with complete paralysis of six month duration or more must be referred.

5.5.3 Commonly affected peripheral nerve trunks

Nerves of face (eyes), hands and feet commonly affected (Fig 5.21)

- Ulnar nerve (upper limb) – Adduction of little finger, Clawing of little and ring finger.
- Lateral popliteal (lower limb) nerve – Foot drop

- Posterior tibial nerve. (lower limb) – Clawing of toes
- Trigeminal Nerve - Corneal and Conjunctival sensation

Other peripheral nerves that may be affected are:

- Median nerve (upper limb) – Clawing of thumb, ring finger and middle finger
- Facial nerve (face) – Inability to close eyelid completely
- Radial nerve (upper limb) – Drop wrist

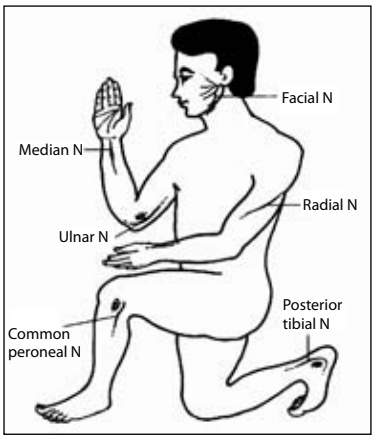


Fig. 5.21 Commonly affected Nerves in Leprosy

5.6 Reactions in Leprosy (Lepra Reaction)

It occurs due to sudden alteration in the immunological status of the host against the living or dead bacilli. Sometimes, it may be the presenting feature of the disease. Reaction can occur at any time, either during the natural course of the disease, during treatment or even after the completion of treatment with MDT. Two types of acute reaction occur. These are type 1 reaction (Reversal Reaction) and type 2 reactions (Erythema Nodosum Leprosum).

Most of the deformities and disabilities in Leprosy results from these Leprosy reactions. However, Leprosy reaction does not indicate the failure of treatment; rather it indicates killing of bacteria and clearance of antigen.

5.6.1 Type 1 reaction

It is a delayed hypersensitivity response (Type IV, Coombs & Gel, hypersensitivity reaction). It can occur in any clinical type of Leprosy, particularly the borderline group with characteristic immunological instability. It is associated with rapid increase in specific CMI activity against the Leprosy bacilli or their remnants, in patients under treatment (usually during the first six months of treatment). It is also known as Reversal Reaction.

Fig. 5.22 Type 1 Reaction

Type 1 reaction presents as inflammation of the existing skin lesions i.e. increase in redness, swelling, tenderness/discomfort and rarely ulceration (Fig. 5.22) appearance of few new inflamed skin lesions and/or neuritis (swelling and pain of nerve). Pain in the nerve occurs due to increased intraneural pressure resulting from oedema and increased cellular infiltration. In addition, patient may present with edema of the hands and feet and sensory/motor impairment. This type of reaction is usually not associated with constitutional symptoms.

5.6.2 Type 2 reactions (Erythema Nodosum Leprosum- ENL)

Fig. 5.23 ENL Type 2 Reaction

Type 2 reaction is also called Erythema Nodosum Leprosum (ENL- Fig 5.23). It usually occurs in MB Leprosy towards the lepromatous end of the spectrum. During the course of treatment a large number of Leprosy bacilli are killed and antigen is released. These antigens combine with the existing antibodies in the tissues and blood, producing antibody antigen complexes (immune complexes) that activate the complement system, resulting in an Arthur reaction (Coombs and Gel type III). Immune complexes get deposited in various tissues with resultant inflammation. Vital organs that may get involved are eyes, testes, kidney, liver, nerve, endocardium and joints.

ENL manifests as crops of evanescent (lasting for few days) erythematous, tender, cutaneous/sub-cutaneous nodules or plaques (Fig. 5.23). They are usually accompanied by constitutional symptoms like fever, malaise, anorexia and joint pain. Neuritis is often an accompanying feature.

5.7 Disabilities and deformities

Physical disability and deformity in Leprosy occurs due to nerve damage (resultant sensory, autonomic and motor impairment). Autonomic impairment results in dry skin that with added sensory impairment, results in development of callosities, blisters and trophic ulcers with day to day friction and injury. If ulcer is neglected, it may further worsen the disability. This is compounded by muscle paralysis leading to deformities as a result of imbalance of forces across joints. Disruption of joint function exposes distal limbs to abnormal pressures which when accompanied by sensory impairment predisposes it to damage and necrosis.

Similarly, recurrent or severe inflammation of ocular tissue can cause visual impairment and even blindness.

5.8 Involvement of other tissue

As the disease progresses in untreated patients, other organs (except the central nervous system) may get affected.

Hoarse cough and husky voice: It occurs due to involvement of laryngeal mucosa which becomes thickened, nodulated and ulcerated which eventually progresses to fibrosis of the vocal cords resulting in immobile cords.

Nails of fingers and toes: Nails appear dry, lusterless, shrunken, narrowed with longitudinal ridges. However, nails are preserved, although digits become shorter and narrower due to bone atrophy and absorption.

Bones, joints and muscles:

- Bone changes occur in untreated disease and once get started it cannot be arrested even on treatment. Changes of bones in Leprosy are usually confined to skull and limbs.
- In limbs deposition of bacilli in the medullary cavities, periosteum, nutrient vessels give rise to **bone cysts, enlarged nutrient foramina, aseptic necrosis and spindle shaped dactylitis, periostitis of tibia, fibula and ulna.**
- **Neurotrophic atrophy** affecting the hand is localized to phalanges. Metacarpal and carpal bones are spared whereas in feet metatarsals, tarsals and phalanges are affected. It commences in the proximal phalanges or head of the metatarsals. In the proximal phalanges, diaphysis of the bone become thin gradually by **rarefying osteitis** (known as concentric bone atrophy) leaving only the **fine needle of the bone** that disappears late. The shortened toes remain connected to the foot by soft tissue only. In metatarsals absorption begins at the distal end of the metatarsal and it becomes thinned and pointed known as **sucked candy stick** appearance. Disuse osteoporosis may also be seen in the limbs with paralysis of muscles.
- **Insensitive limbs** are predisposed to repeated big and small injuries that result in bone atrophy and absorption. It can also lead to charcot joints in fingers, toes, wrist and ankles. Ulcers may get infected secondarily.
- **Muscle paralysis** leads to **disuse atrophy** of the muscles and in neglected cases to **fibrosis or bony ankylosis** of inter-phalangeal joints, metacarpo-phalangeal and metatarso-phalangeal joints.

Testes: Varying degree of testicular atrophy is likely to occur particularly if the disease is untreated or the treated patient undergoes repeated attacks of acute epidydimo-orchitis during type 2 reaction. In earlier stages of testicular atrophy the patient remains sexually potent but his semen shall be

devoid of spermatozoa, therefore he is sterile. Impotence and gynaecomastia of hormonal origin develops late.

Skull: Atrophy of the anterior nasal spine usually occurs due to leprous endarteritis and pyogenic osteomyelitis (due to gross ulceration of nose) and may lead to destruction of nasal cartilage and atrophy of maxillary alveolar process leading to **nasal collapse (saddle deformity** of the nose) and **loosening of upper central incisors** or all the four incisors.

Reticulo-endothelial system: There may be generalized, painless, discrete enlargement of the lymph glands in MB patients. The enlarged glands have consistency of soft rubber and changes are more marked in superficial lymph nodes esp. femoral, inguinal and epitrochlear lymph nodes. However, in type 2 reaction it may be associated with swelling and tenderness.

Abdominal organ: Abdominal organs especially **spleen and liver** may get infiltrated by M. leprae laden macrophages and become enlarged.

Kidney: Glomerulonephritis, interstitial nephritis and **pyelonephritis** may occur especially in severe cases. Renal amyloidosis is prevalent in some geographical areas.

5.9 Leprosy and pregnancy

During pregnancy sub-clinical disease may become overt and established disease may worsen due to depression of Cell mediated immunity (CMI). Increased incidence of lepra reaction occurs especially during first six months of puerperium/lactation due to regaining of CMI. Deterioration of nerve function may occur during pregnancy and lactation. New borns of Leprosy affected mothers weigh less than that of healthy mothers and is at high risk of getting infected with Leprosy.

5.10 Leprosy and HIV

There is no positive correlation between HIV positivity and development of Leprosy. HIV positive patients who are put on Highly Active Anti Retroviral Therapy (HAART) may manifest Leprosy (which was earlier sub-clinical) as well as Lepra Reaction. The Leprosy patients with concurrent HIV may have higher incidence and severity of Lepra reactions requiring higher doses of steroids.

Chapter 6

Diagnosis of Leprosy & Clinical Examination of Person Affected by Leprosy

Structure

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- 6.2.2 Infiltration/thickening of skin
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6.14 Recording of findings

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6.16.2 Examination of previously treated person affected by Leprosy

6.17 At confirmation of diagnosis of Leprosy

6.18 Ethical responsibility while diagnosing Leprosy

Learning Objectives

At the end of the session trainees will be able to:

- **Enlist the common symptoms that help service providers to suspect Leprosy**
- **Demonstrate/elicit cardinal signs of Leprosy**
- **Grade the disability**
- **Assess treatment needs of Leprosy disabled person**
- **Appreciate the complexity of diagnosis and need for referral**

Teaching method: Lecture discussion and case demonstration, re-demonstration & discussion, group exercises. Trainees are grouped into 4–5 groups, a case is allotted to each group, and trainer observes/facilitates the clinical assessment and its recording.

6.1 Introduction

A Leprosy affected person may not come with Leprosy related complaint due to the following reasons:

- Leprosy related skin lesions do not hurt due to loss of sensation.
- Lack of awareness about the disease and curability of the disease.
- May not know that treatment is available at the health centre.
- May not know that treatment is available free of cost.
- Not able to afford traveling cost.
- Hides the disease for the fear of stigma.

Health worker(s) may refer the person, suspected to have Leprosy or persons may come to health centre for some other problem on their own. Therefore, whenever you come across a person having signs and symptoms related to Leprosy or its complications, the person should be examined to confirm the diagnosis.

Medical Officers are responsible for:

i) Confirmation of diagnosis,
ii) Complete assessment of the affected person,
iii) Assessment of treatment needs,
iv) Starting treatment after registration of the affected person,

Who is a case of Leprosy?

A person with cardinal clinical signs of Leprosy,

Who has never taken treatment and/or

requires anti-Leprosy treatment

6.2 Suspecting Leprosy

If, any of the following is present, suspect Leprosy!

6.2.1 Skin Patch

Pale or reddish patch on the skin (Fig 6.1 to 6.4) with lost/ impaired sensation for heat, cold, fine touch and pain on pinprick:

- Hypo-pigmented, erythematous or copper coloured
- Small/Large
- Flat, raised or nodular
- Can be located anywhere (but more on cooler exposed body parts)

Fig. 6.1 Multiple well-defined erythematous skin patches

Fig. 6.2 Small well-defined hypopigmented macular lesion on face

Fig. 6.3 Large hypopigmented macular lesion on thigh

Fig. 6.4 Well-defined hypopigmented macular lesion on back

Fig. 6.5 Scaly skin lesions (Psoriasis)

But not if, lesion is:

- White (depigmented), dark red or black in colour
- Shedding scales (except after Type-1 reaction)
- Itchy
- Present since birth
- Painful and hurts
- Appears or disappear suddenly or changes with seasons.

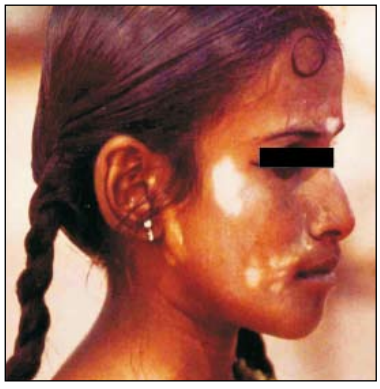


Fig. 6.6 Depigmented macular lesion (vitiligo)

6.2.2 Infiltration/thickening of skin

Infiltration/thickening of skin and/or papule(s), plaque(s) nodule(s): such as

Fig. 6.7 Nodular lesions (elbow)

Reddish or skin coloured **nodules** (Fig. 6.7) or **smooth shiny diffuse thickening of skin** without loss of sensation

Fig. 6.8 Infiltrative skin lesions on face

Swelling/nodules in the face (Fig. 6.8) and earlobes (Fig. 6.9)

Fig. 6.9 Nodular lesions earlobe

6.2.3 Involvement of peripheral nerves

Painful and tender/palpably thickened nerves

Cord like thickening of nerves with or with out pain and tenderness: esp. behind the ear (Fig. 6.10), around elbow, wrist, knee and ankle joints (Fig. 6.11).

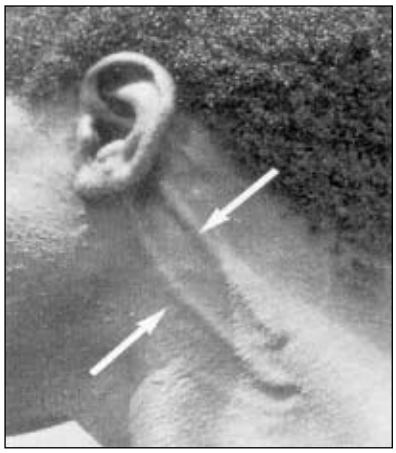


Fig. 6.10 Thickened Greater auricular nerve

Fig. 6.11 Thickened superficial peroneal nerve

Numbness or tingling of hands or feet

or

Loss of sensation: (temperature, touch, pain) esp. in tips of fingers and sole of the foot and over skin lesions.

6.2.4 Disabilities and deformities of hands, feet and eyes

Usually, the following deformities/disabilities may be found in Leprosy patients.

Weakness of hands, feet, and/or eyelids and inability to perform certain movements may occur due to Leprosy:

- Inability to hold, pinch, run, retain chappal, touch tip of fingers with tip of thumb
- Move hand backward on wrist (Wrist Drop),
- Move foot upwards on ankle (foot drop) or
- Close eyes completely.

Claw hands (Fig. 6.12 & 6.13) or claw feet

Fig. 6.12 Ulnar claw hand

Fig. 6.13 Complete (Ulnar & median) claw hand

Drop foot: Inability to move foot upwards on ankle joint (Fig. 6.14) and inability to retain chappal in the foot and walks with high stepping gait.

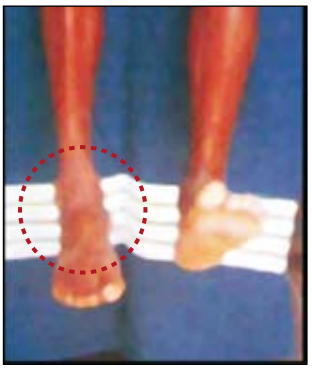


Fig. 6.14 Foot drop (right foot)

Drop wrist: Inability to move hand backward on wrist joint (Fig. 6.15).

Fig. 6.15 Drop wrist

Inability to close eyes completely (Fig. 6.16).

Fig. 6.16 Lagophthalmos (right eye)

6.2.5 Repeated painless injury/burn marks

Fig. 6.17 Planter (trophic) ulcer

Fig. 6.18 Ulcers due to burns

Repeated painless ulcers/burns in soles (Fig. 6.17) and palms (Fig. 6.18) may be due to Leprosy.

Late stages deformities due to bone absorption/bone destruction may also be seen.

Fig. 6.19 Skin patch in reversal reaction (Type 1 reaction)

6.2.6 Leprosy Reactions

A person with Leprosy can have a reaction at almost any time; before treatment, at diagnosis, during treatment and after completion of treatment.

There are two types of Lepra reactions.

a. Existing lesions may expand, become red, swollen and hot and painful to touch. **(Type-1 reaction, Fig. 6.19).**

b. Occurrence of painful red nodules on face, arms and legs with fever, body ache, loss of appetite etc. **(Type-2 reaction, Fig. 6.20);** involvement of ocular tissue especially iridocyclitis and/or recent deterioration of vision.

Fig. 6.20 Erythema Nodosum Leprosum (Type 2 reaction)

Swelling of hands and/or feet may be present in reaction

6.2.7 Other signs

Also suspect and look for other symptoms and signs for confirmation of Leprosy like trichiasis, thinning of eyelashes and/or eye brows, sagging of lower eyelid, epiphora (watering of eyes), Epistaxis (bleeding from nose), chronic blockage of nose due to infiltration and crust formation or, wasting of muscles of limb with/without shiny skin and loss of hair and/or hoarseness of voice (Refer manifestation of disease in chapter 5 on Pathogenesis of Leprosy).

6.3 Cardinal signs for confirmation of Leprosy

Diagnosis of Leprosy is confirmed by eliciting at least one of the three cardinal signs of Leprosy through systematic clinical/bacteriological (whenever required) examination.

The three cardinal (very important) signs for confirmation of diagnosis of Leprosy are:

The three Cardinal Signs of Leprosy:

1. **Hypo-pigmented or reddish skin lesion(s) with definite sensory deficit**
2. **A thickened or enlarged peripheral nerve with loss of sensation and/or weakness of the muscles supplied by that nerve**
3. **The presence of Acid-fast bacilli in slit skin smears or histopathology**

Presence of any one out of three cardinal signs is essential to diagnose Leprosy.

In a suspected case of Leprosy if the first two cardinal signs are absent, the person should be referred to an identified referral centre for slit skin smear examination.

Other investigations that can be used for diagnosis of Leprosy are histopathological examination of tissue after skin biopsy is taken from the edge of the lesion, nerve biopsy of affected cutaneous nerve, fine needle aspiration from lymph nodes and Polymerase Chain Reaction (PCR).

6.4 Assessment of person affected by Leprosy

After confirming the diagnosis of Leprosy by the presence of one or more of the cardinal signs, the persons affected by Leprosy must be clinically assessed in detail (as outlined below), to determine their disease management needs.

Clinical assessment of persons affected by Leprosy:

- **Elicit detailed history**
- **Carry out general physical examination**
- **Examine skin for presence of skin lesions**
- **Test for loss of sensation in the skin patch(es)**
- **Note the number of skin patches**
- **Palpate nerves for thickening/tenderness/consistency and number affected**
- **Test sensation in the palm and soles**
- **Look for normal blinking and redness of the eyes and visual acuity**
- **Observe for presence of any disability due to Leprosy**
- **Perform voluntary muscle testing**
- **Grade the disability and record the EHF score**
- **Record the findings**
- **Decide the needs of the person**
- **Register the person for treatment and counsel the persons affected by Leprosy**

6.5 Eliciting detailed History

Leprosy affected person may present with any of the following complaints related to affected part of the body.

6.5.1 Leprosy related complaints may include:

- Skin lesion(s) lighter than the surrounding skin and/or reddish patch.
- Lesion(s) may be dry to touch (or having reduced sweating), with/without noticed loss of sensation and/or loss of hair.
- Loss of eye brows/eyelashes, inability to close eye completely or impairment in blinking of eye.
- Nodules/lumps on the skin or earlobes.
- Chronic blockage of nose (may give history of epistaxsis).
- Recent Impairment of vision or red painful eye, watering from eye, impaired blinking.
- Pain/tenderness at the elbow (Ulnar nerve), wrist (Radial cutaneous nerve/Median nerve), at back of Knee (Common peroneal nerve) and/or at ankle (posterior tibial nerve).
- Presence of unusual sensation in hands and feet like tingling, numbness, burning, or sensation of crawling insect may be the presenting symptoms of nerve involvement.
- Weakness of grip, inability to pinch, things tend to fall/slips out of the hand, things feel different while held in the hand. Painless/repeated wounds or burns on hands and feet.
- Hands or feet feel weak, slimmer with shiny skin, loss of hair.
- Inability to retain chappal (footwear without back strap) in the foot and/or foot interferes/ gets turned while walking.
- Person walking with high stepping gait to clear foot from the ground in foot drop.

6.5.2 Case history

Detailed history of the presenting complaint must be elicited.

If person does not complain, ask the following leading questions to find clinical involvement, its sequence of evolution and duration of each positive clinical feature.

Details of skin lesions

- **Duration of skin lesion:** Since when is it present? A patch of a few days or one present since birth is not Leprosy.
- **Progress of skin lesions:** How did it start? Has it changed? Skin lesion(s) of sudden onset, are unlikely to be Leprosy (except reactions). Leprosy patches usually appear slowly.
- **Characteristics of skin lesions:** Leprosy patches do not itch and are usually not painful. There may be associated loss of hair.
- **Sweating:** Area of the skin lesion may not sweat.
- **History of recurrence**: A recurrent lesion which "comes and goes" or one that to seasonal; is not Leprosy.

Other details: Try to find, whether–

- Skin has become drier in a particular area?
- History of redness or swelling of skin lesions or appearance of firm, painful nodules under the skin in crops that disappear with in a week (reaction) is present.
- Hands or feet have become weaker?
- Feels loss of sensation or abnormal sensation in hands and/or feet? Has problem with holding, manipulating or lifting things or any other activity?

- Has problem in moving hands and feet; or close eyes completely, eyes are painful and/or blurring of vision is present?
- **Presence of any disability:** Ask time of its onset i.e. duration of disability and nature of its progress?
- **Any other associated illness:** Ask whether person is taking medication for any other illness and if yes, find details about the nature of the illness and treatment being taken for it. H/o anaemia (needs treatment of anaemia along with MDT) jaundice (start MDT after jaundice subsides) cough (if taking treatment for tuberculosis; continue Rifampicin in the doses recommended under RNTCP), HIV/AIDS (on ART) and rule out any other illness.
- **Treatment history:** Type of treatment taken, name of the drugs taken (show blister packs), duration of treatment taken, whether treatment was taken regularly or not. Any treatment taken for disability, response of the treatment, place from where the treatment was taken, whether treatment was completed as advised by the treating physician, reason for discontinuing the treatment or coming to this centre.
- **History of drug allergy:** e.g. allergy for sulpha drugs (avoid Dapsone)
- **Family History:** Any other person in the family or close contacts having similar disease or treated for it.
- **If patient is female:** Take detailed menstrual history to exclude pregnancy especially if reaction is suspected. Though MDT can be used safely during pregnancy, advice the person to take precautions to avoid pregnancy till taking medication because it is better to avoid all medications during first trimester of pregnancy.

For history and examination of ocular lesions; refer chapter 9, on ocular Leprosy.

6.5.3 General physical examination

- **General condition:** General condition is usually satisfactory and persons affected by Leprosy do not show any signs of toxicity except during lepra reactions.
- **Temperature:** A person affected by Leprosy is usually not febrile except during reactions or secondary infection of ulcers/ bone/ any other affected organ.
- **Symmetry of face:** Angle of mouth may be pulled towards normal side (paralysis of facial nerve) absence of folds and creases of face on the affected side indicate facial nerve involvement. Loss of forehead folds may indicate involvement of frontalis muscle.
- **Pallor:** Look at the palpebral conjunctiva for anemia (pallor). Colour of tongue, hands and nails help to suspect anaemia that can be confirmed by testing blood for hemoglobin. Dapsone causes anaemia and can increase/decompensate pre-existing anemia. If haemoglobin is less than 10 gm%, start iron, folic acid, ascorbic acid and advise person to take high protein diet along with MDT.
- **Icterus:** Look for icterus on bulbar conjunctiva on first as well as on every follow up visit of patient; because it may also occur as one of the side effects of MDT. Look for yellow discolouration in natural light. If present, advise serum bilirubin (Total, Direct and Indirect) if total bilirubin is more than 1mg%; refer the person to higher centre for further management. Start MDT after serum bilirubin level becomes normal.
- **Involvement of lymph nodes:** May become palpably enlarged in all MB cases and become tender in ENL.
- **Other systemic diseases:** Other systems are not affected normally in Leprosy but may get affected during reactions. Exclude hypertension and diabetes because in case of reactions or neuritis corticosteroids are used and these people then require referral.
- **Swelling/oedema of hands and feet:** If present the patient should be screened for kidney function.
- **Condition of the skin:** Look for dry skin, presence of cracks, callosities, wounds or ulcers; presence of small frail hair/absence of hair and absence of sweating in the area of the affected nerve.

6.6 Examination of skin lesions

Skin lesion(s) are common and may be the only presentation of the disease. Skin lesions in Leprosy can appear anywhere. Examine the whole body surface preferably in natural sunlight and always test the skin lesions for presence of any sensory deficit (Refer section 6.3.2) and look for loss of sweating and/or hair over the lesions.

6.6.1 Precautions for examination of skin lesion

- Examine the person under good light (preferably natural light)
- Provide privacy during examination
- Examine as much as possible of the whole skin, i.e. from head to toe.
- Always use the same order of examination, so that you do not forget to examine any part of the body.
- Ensure presence of a female attendant while examining women.

6.6.2 Details of skin lesions

Observe and palpate to note the following about skin lesions.

Fig. 6.21 Well-defined hypopigmented skin patch

- **Site and distribution:** Noting the site of skin lesion is useful for follow-up and to ensure identification of fresh lesions later. Note the site of all the lesions on the back of the patient card/chart. Larger asymmetrical/ unilateral lesions are more frequently seen in PB type of Leprosy.
- **Margin(s):** Margins may be well-defined or ill defined. The edges of the lesions tend to get progressively more irregular and indistinct as the immune status of patients worsens.
- **Number:** This is most useful for grouping and follow-up. 1–5 skin lesions and/or single nerve trunk involvement means PB where as six or more skin lesions and/or 2 or more nerve trunk involvement or both indicates MB type of Leprosy.
- **Colour:** Lesion are usually hypo-pigmented (lighter in colour than the rest of the skin), or erythematous (reddish). Lesions of Leprosy are never completely de-pigmented.
- **Surface:** May be smooth, shiny or dry.
- **Hairs on the lesion:** May be normal, scanty, small frail or absent.
- **Sensory deficit:** This is a **cardinal sign** for diagnosis when elicited over a lesion. The sensory impairment/loss may lie over skin lesion(s), area of nerve distribution or glove and stocking in pattern.
- **Tenderness:** Tenderness of skin lesions is seen in reactional state. Tenderness over the nerves is indicative of neuritis.
- **Palpate around the edges of the lesions** to find the thickened nerves entering the skin lesion (Pathognomic of Leprosy – "nerve to patch")
- **Presence of infiltration:** This term refers to skin that is **thickened, shiny** and **erythematous.** All three features must be present in the same area. This infiltration may be localised to form plaque(s) or become diffuse. Diffuse infiltration may be the only early presenting sign in some cases of MB Leprosy (lepromatous Leprosy). Papule(s)/nodule(s) may develop when infiltration becomes coarse.
- **Presence of Nodules:** Firm nodules may be present/appear on the skin of the extensor surface of limbs and face in some cases of MB Leprosy and in Type 2 reaction. (If present, press them gently to elicit tenderness and blanching to confirm ENL of type 2 reaction). These tend to be evanescent (last for a few days) and come in crops.
- **Inflammation and expansion of existing skin lesion:** Presence of erythema and discomfort (paresthesia, warmth and/or pain) are signs of activity of skin lesions. Swelling, redness, discomfort of skin patch(es) is present in type 1 reaction.

Table 6.1 Differences between nodules of Leprosy and ENL Nodules

Differentiating Features	MB Leprosy Nodule	ENL Nodule
Time of evolution	Slowly appearing, one at a time at individual rates of progression	Sudden appearance in crops, commonly in late evenings
Tenderness	Usually not tender	Usually tender
Associated Symptoms	None	Acute constitutional symptoms like fever, loss of appetite, malaise, etc.
Spontaneous resolution	Not Seen, tend to persist	Typically evanescent, individual lesions tend to resolve over some days leaving behind pigmentation

6.6.3 Eliciting sensory loss in skin patches

It is very important to pick up the skill of eliciting sensory loss in skin patch.

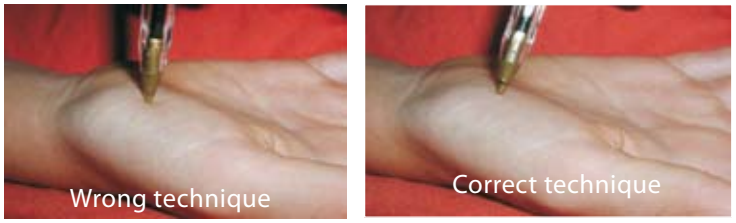


Fig. 6.22 & 6.23 Sensory testing

- A ball point pen is needed to examine the sensory deficit.
- Make person comfortable (sitting/lying)
- Explain the procedure to the person and demonstrate it with open eyes on normal skin.
- Touch the skin with the pen (pen being perpendicular to the skin) lightly using weight of the pen (do not press), teach the individual to point to the touched spot with his index finger/or count on each touch felt by the person or say yes on each touch while testing the lesions over inaccessible areas i.e. unapproachable areas of back and buttocks).
- Repeat this procedure a few times until the person is familiar and comfortable with the procedure.
- Now ask the person to close the eyes and repeat the procedure over the area to be tested (first touch on the normal skin then over the affected area).
- Repeat test on insensitive area again.
- Keep varying the pace of touch.
- Test as many lesions as possible.
- Do not use other "instruments" like pin, cotton wool, feather, etc.
- When testing for sensation, touch the skin lightly with the pen. Do not stroke. The force of contact must be the same each time the skin is touched by the ball-point pen.

Fig. 6.24 Testing sensation on a skin lesion

Remember the first Cardinal Sign:
Definite loss of skin sensation is characteristic of Leprosy

Note:

(i) Leprosy patch on the **face** may **not** have elicitable sensory deficit because of the overlapping nerve supply of the skin of the face

(ii) Areas of **thick skin** which are otherwise normal may **not** feel the above "standardized" touch. (Soles, elbows).

(iii) It may be difficult to obtain cooperation in **children.** Ask the child to sit or play in the sun and then examine for sweating and look for loss of sweating in the patch. For small children touch the sleeping child on the patch, if sensation is present withdrawal movements may be seen.

Interpretation of test for loss of sensation:

- **Loss of sensation if patient does not respond to touch**
- **Reduced or impaired sensation if person touches >3cm away from the touched point (> 1 cm for flexor surface of limbs)**
- **Normal sensation if localized within 3 cm**
- **Compare with opposite side or adjacent skin to elicit subjective impairment of sensation (in doubtful loss of sensation, it helps in clinical decision making)**

Note: While examining the skin.

Look and palpate for thickened nerves like ulnar, lateral popliteal, posterior tibial nerves, radial cutaneous, median, greater auricular, supra orbital and supra trochlear. While examining the skin also look for existing disability or deformity, callosities, painless blisters/ulcers. These indicate the involvement of the nerve supplying the affected area

6.7 Examination of the nerves

Usually peripheral nerves are involved and get thickened with or without loss of sensation in the area supplied by the affected nerve and weakness/paralysis of muscles supplied by the nerve.

Examination of nerves in all the patients is essential for:

- **Diagnosis**
- **Classification/grouping**
- **Follow-up**
- **Interventions for prevention of deformity**

Remember the 2nd "Cardinal sign"!

Involvement of the peripheral nerves (hands, feet or eyes) is demonstrated by:

- **Definite thickening/tenderness of nerve on palpation. This is more easily perceived when it is asymmetrical by simultaneous comparison of the two sides**
- **Loss of sensation in area supplied by the nerve and/or**
- **Weakness/paralysis of the corresponding muscles**
- **Presence of Disability or Deformity confirms involvement of the nerves. Thin and fibrosed (cord- like) nerves can be palpated in long standing cases**

6.7.1 Clinical Presentation in nerve involvement

At the time of first visit to health centre, there may be:

- **No demonstrable nerve** involvement.
- **Thickening** of the nerve trunk with out any symptom/sign.
- **Acute neuritis** i.e. painful, tender and thickened one or more nerves.
- **Chronic neuritis** where pain and tenderness is less prominent but damage to the nerve gradually increases.
- **Complete nerve destruction** i.e. complete paralysis for more than one year (fibrosed nerve, "cord like" on palpation).

Always ask for:

- Time of onset of the mentioned problem
- Nature of its progress

Two components of nerve examination are:

- **Palpation of the nerves:** For thickening, tenderness and consistency (cord like/fibrosed).
- **Assessment of nerve function:** Autonomic, sensory and motor functions.

Assess nerve function for:

- **Autonomic function : Presence of sweating, hair loss, dry brittle skin, cracks**
- **Sensory deficit (ST) : In the area supplied by the nerve by Sensory Testing**
- **Power of muscles (VMT) : Assessing the strength of movement of the voluntary muscles supplied by the nerve called Voluntary Muscle Test**

6.7.2 Procedure for palpation of a nerve: Peripheral nerves are also palpable in healthy persons. Hence, look for thickening (compare the nerves of the two sides), tenderness and consistency of the nerve.

- Position the patient correctly.
- Locate the nerve correctly.
- Look at the patient's face while palpating the nerve gently with the pulp of the finger (not the tip of the finger) to elicit tenderness.
- Always palpate across the course of the nerve.
- Feel along the nerve as far as possible in both directions. A localized fluctuant and tender swelling may represent a nerve abscess.
- Nerves on the two sides must be compared to detect any abnormality.
- Besides nerve trunk examination, examine area around/proximal to area of loss of sensation/ around skin lesion for thickening of cutaneous nerves, especially those entering the skin lesions.

6.7.3 Assessment of sensory function of nerve trunk

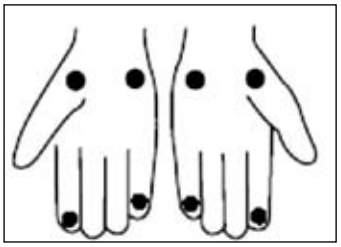


Fig. 6.25 Four points in hand for sensory testing

Test the sensory loss in the area supplied by the affected nerve. To detect the sensory loss, use a ball pen and test the sensation at four points in the hand (Fig. 6.25) as well as in the foot (Fig. 6.26). for detailed procedure of sensory testing refer section 6.6.3

Fig. 6.26 Four points in hand for sensory testing

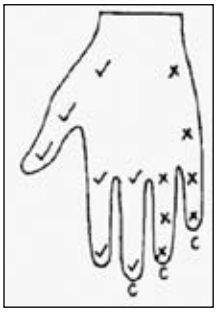


Fig. 6.27 Testing sensation more thoroughly to keep record

Impairment or absence of sensation at any of the point needs testing of the sensation at more points (Fig. 6.27 & 6.28) in that area to identify the exact extent of sensory loss. Refer section on individual nerve assessment for details of sensory supply by peripheral nerve trunks.

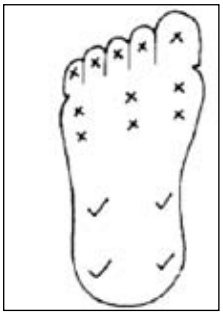


Fig. 6.28 Testing sensation more thoroughly to keep record

6.7.4 Assessment of the motor function of nerve (VMT)

Range of Movement of joints: Check the range of movement performed by the muscle to see whether person is able to move the joint through full range or not. If the voluntary movement of the joint is reduced/absent, it means that the muscle is weak/paralysed. Assist the person to move the joint through normal range of movement of all the adjacent joints (passive movement) to assess stiffness of the joints and development of contractures of weak/paralysed muscle.

If movement is normal, test the strength of movement of the muscle by applying pressure gently in the opposite direction of the movement and gradually increase the pressure while asking the person to maintain the position. Judge whether resistance applied by the person is normal, reduced or absent. Compare the strength of the two sides. Grading of muscle strength is done as follows:

S (Strong)	=	Able to perform the movement against full resistance.
W (Weak)	=	Able to perform the movement but not against full resistance.
P (Paralysed)	=	Not able to perform the movement at all.

(for assessment of motor function of specific nerve - refer examination of individual nerve)

Testing mild muscle weakness in early stages of nerve damage: Mild weakness of the muscles in early stages of nerve involvement can be assessed rapidly by performing certain rapid clinical tests. Combination of two to three tests can be used to find mild weakness of the muscles as given below.

For hand muscles:

(i) **Beak test:** Ask the person to join tips of all the fingers of hand and extend the wrist like head and beak of a bird(Fig. 6.29). Ask the person to keep the hand in this position for 30 seconds. Little finger will stand out in ulnar nerve weakness. Person will not be able to maintain position of thumb in median nerve weakness and wrist will not remain extended in radial nerve weakness.

Fig. 6.29 Beak test

(ii) Ask the person to keep all the **fingers straight** and together. In ulnar nerve weakness, little finger cannot be kept straight and together with other fingers. It stays a little apart from the rest of the fingers and may also get bent or clawed.

(iii) Ask person to hold the thumb abducted that is perpendicular to the palm and tip of the thumb pointing upwards and not forwards for 30 seconds. Inability to keep the thumb in this position indicates early stages of involvement of median nerve.

(iv) Ask person to stretch both arms straight in the front and hold wrist and fingers up as much as possible (Dorsiflex). Keep it in this position for 30 seconds. During early stages of radial nerve weakness, person will not be able to hold hands in this position.

Test for lower limb:

(i) Ask the person to lift all the toes (dorsi-flex the foot and toes) and hold them is this position for 30 seconds. Test the resistance by applying pressure against the toes (big toe in particular). The resistance can be assessed as normal or weak.

Grade the muscle power as 'S', 'W' or 'P' as described above.

6.8 Examination of important nerves of the face and the neck

Commonly affected nerves in the face are Trigeminal nerve and Facial nerve. Besides these, thickening of Greater auricular nerve, supra-orbital and supra-trochlear nerve can also be noted.

6.8.1 Trigeminal nerve

Sensory part of the trigeminal nerve supplies the conjunctiva and cornea and part of the facial skin. Most important effect of involvement of the trigeminal nerve is reduced or loss of sensation of cornea that affects blinking of the eye. Hence, irregular/infrequent/absent blinking indicates involvement of trigeminal nerve.

6.8.2 Supraorbital and supratrochlear nerves

Supraorbital and supratrochlear nerves are cutaneous branches of the trigeminal nerve that may become visibly thickened (Fig 6.30) and can be palpated by passing the finger along the upper border of the orbit.

Fig. 6.30 Thickened Supratrochlear nerve

6.8.3 Facial nerve

Facial nerve (motor) supplies various muscles of the face including orbicularis oculi. Paralysis of facial nerve in Leprosy is of lower motor neuron type affecting the muscles of half of the face on the same side with loss of creases and expressions. Face becomes flat and angle of mouth is pulled towards the normal side. Weakness/paralysis of orbicularis oculi is important because it affects the closure of the eyelid. Inability to close the eye is called Lagophthalmos (Fig. 6.31) and has grave consequences leading to blindness. (For details please refer chapter on ocular Leprosy)

Fig. 6.31 Lagophthalmos left eye

6.8.4 Greater Auricular Nerve

The nerve innervates skin of angle of the mandible and parotid area and can become visibly enlarged (better seen than palpated Fig. 6.32).

Site: It is visible on the side of the neck, below the ear, crossing the upper third of the sternomastoid muscle, lying parallel to the external Jugular vein.

Palpation of nerve: To palpate the nerve on right side, ask the person to turn head to opposite side (left side) so as to tighten the sternomastoid muscle.

Fig. 6.32 Thickened Greater auricular nerve

Nerve is seen crossing the upper third of the muscle lying parallel to the external Jugular vein. Gently palpate the structure with pulp of the two fingers to make sure that it is nerve and not vein (can feel fluid inside vein and vein can be emptied).

6.9 Examination of nerves of the limbs

Observation: Look for Autonomic function of the nerve, deformities and other secondary impairment

Fig. 6.33 Dry skin with cracks

Dryness of hands and feet: Presence of cracks (Fig. 6.33) and callosities

Absence of sweating: Feel palms/soles of the person with back of your hand to determine whether skin is moist and cool/dry and warmer. Temperature of non-sweating skin is close to the temperature of the surroundings.

Condition of hairs: Hair may be absent/become brittle in the area of skin supplied by the affected nerve.

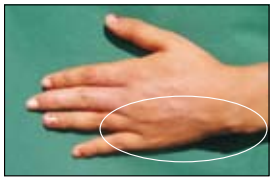


Fig. 6.34 Muscular atrophy

Presence of muscle atrophy/wasting (Fig 6.34): Thenar eminence (median nerve weakness) and hypo-thenar eminence (ulnar nerve involvement).

Fig. 6.35 Nerve abscess

Presence of Abscess/sinus: Presence of abscess or sinus along the line of course of the nerve indicates localised necrosis of the nerve (Fig. 6.35).

Impairment and disability: Claw hand with atrophy of the interossei, clawing of little and ring finger (ulnar nerve), clawing of lateral 3 ½ fingers (median nerve), Drop wrist (radial nerve), Claw toes (Posterior Tibial nerve), Drop foot (common peroneal nerve).

Fig. 6.36 Blister on index finger

Sensory loss: Presence of painless blisters (Fig. 6.36), burns or ulcers.

6.10 Examination of individual nerves

A) Examination of commonly affected nerve trunks of upper limb:

Nerves affected in the upper limb are ulnar, median and radial nerves.

6.10.1 Ulnar nerve

Ulnar nerve in Leprosy is affected at the elbow and can be palpated in the olecranon groove, just above and behind medial epicondyle of the elbow. Person **complaints** of clumsiness in use of hand, bent little finger, little finger coming in the way/not cooperating, while working.

Area of sensory loss: Palmer aspect of medial one and a half finger i.e little finger and medial half of ring finger and corresponding part of the palm and back of the hand (Fig. 6.37 & 6.38).

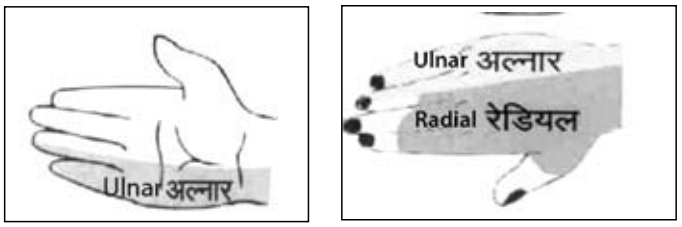


Fig. 6.37 & 6.38 Area of Sensory supply by ulnar nerve

Muscle wasting: Flattening of medial side of the palm, hypo-thenar eminence and bulge of muscle in the back of hand between thumb and index finger.

Site of nerve palpation: In the groove above and behind medial epicondyle of the elbow (Fig 6.39).

Fig. 6.39 Palpation of ulnar nerve

Palpation of the Ulnar nerve: Both the patient and examiner face each other.

- To examine right ulnar nerve, ask the patient to flex the elbow joint slightly. Hold the right wrist with your left hand.
- Using right hand, feel for the medial epicondyle.
- Pass just behind it and feel the ulnar nerve in the groove.
- Gently palpate with pulp of 2 fingers (index and middle) and feel across the nerve, constantly watching facial expression for signs of tenderness (Fig. 6.39).
- Trace the nerve proximally as far as to possible to ascertain the length of the swelling.
- Some times, cutaneous branch of ulnar nerve may become visibly palpable (Fig. 6.40).

Fig. 6.40 Thickened dorsal cutaneous branch of ulnar nerve

Deformity: Clawing of little and ring finger (hyperextension at Meta-carpo-phalangeal joint and flexion at proximal and distil interphalangeal joint (Ulnar Claw Hand Fig. 6.41).

Fig. 6.41 Ulnar claw hand

Voluntaey muscle testing: If nerve weakness is present, test the functioning of ulnar nerve by **Little finger out test** and grade the muscle weakness.

Little finger out test:

- Test abduction of the little finger (Fig. 6.42 & 6.43).
- Ask the person to put out the hand with palm facing upwards and support the hand in your hand by holding the fingers except the little finger or keep it on table as shown (Fig 6.42).
- Ask the person to move the little finger sideways/out i.e. away from the other fingers in the same plane as palm.
- Test with pressure at the base of the little finger as shown by pushing it towards the hand while the person tries to hold it in the test position (Fig. 6.43).

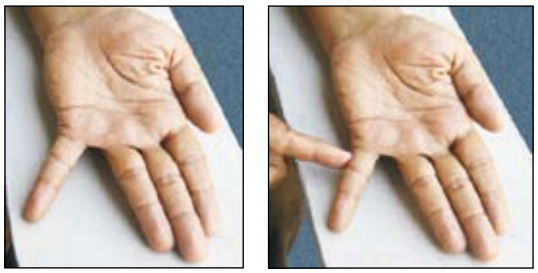


Fig. 6.42 & 6.43 VMT for ulnar nerve

6.10.2 Median Nerve

Median nerve is affected at wrist as it passes in the carpal tunnel under the flexor retinaculum of the hand and is palpable (with experience) proximal to the wrist, deep and medial to Palmaris longus tendon, when the wrist joint is semi flexed. Person **complaints** weakness of grip, difficulty in holding and manipulating objects, difficulty in pinching or picking or holding small objects, buttoning of shirts etc.

Area of sensory loss: Palmar aspect of lateral three and a half finger i.e thumb, index, middle finger and lateral half of ring finger and corresponding part of the palm (Fig. 6.44).

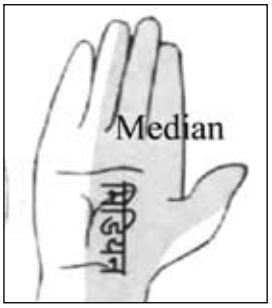


Fig. 6.44 Area of Sensory supply by median nerve

Muscle wasting: Flattening of thenar eminence.

Site of palpation: Proximal to the wrist, deep to Palmaris longus tendon when joint is semi flexed. Nerve lies parallel to the palmaris longus.

Palpation of the nerve: Both the person and examiner face each other.

- To examine right median nerve, support the right hand in your left hand.
- Using the pulp of index and middle finger of the right hand feel for the palmaris longus tendon in the middle of the wrist. Median nerve lies deep and medial to the palmaris longus in line with the ring finger (Fig. 6.45).
- Gently palpate the nerve medial to the tendon while flexing the wrist slowly against resistance.

Fig. 6.45 Palpation of median nerve

Motor loss: Involvement of median nerve affects the functioning of the hand due to weakness/paralysis of thumb, index finger and middle finger. Inability to oppose fingers by thumb e.g. during grasp and pinch.

Deformity: Clawing of thumb (bent backwards at the wrist and forwards in the middle and at the tip. Deformity due to median nerve is usually associated with that of the ulnar nerve resulting in complete claw hand (Fig. 6.46).

Fig. 6.46 Complete (ulnar & median nerve) claw hand

VMT for Median Nerve: thumb up test.

- Abduction of thumb is tested.
- Ask the person to put out the hand with palm facing upwards; support the hand with your hand.
- Ask the person to hold his thumb at right angle to the palm (abduct thumb/thumb up position, Fig 6.47).
- Keeping the wrist slightly extended, apply resistance at the head of the first metacarpal to push the thumb towards index finger, by the side of the palm while the person tries to hold it in the test position (Fig. 6.48).

Fig. 6.47 & 6.48 VMT for median nerve

Grade the muscle power as 'S', 'W', or 'P' as described above in section for voluntary muscle testing (VMT). If the person is unable to resist and you can move the thumb down easily, muscle is weak; but if person cannot point the thumb upwards at all, paralysis of muscle is present.

6.10.3 Radial nerve

Radial nerve has two parts. The main nerve in the arm supplies the muscles at the back of the forearm and Superficial cutaneous branch of radial nerve, supplies the skin on the back of the hand. Superficial nerve is commonly affected in Leprosy. Main trunk is only occasionally affected and palpable in the oblique groove posterior to the insertion of deltoid muscle in the arm.

Damage to the main nerve trunk causes disability because muscle balance of all the joints of the hand i.e. wrist, fingers and thumbs, is disturbed. Sensory loss in the area of supply of radial nerve does not indicate involvement of main nerve trunk. Radial cutaneous nerve branches out early from the main nerve. Hence, thickening of this branch may not be associated with muscle weakness. Thickened radial cutaneous nerve can be seen or palpated occasionally at the back of the hand.

Radial nerve trunk supplies the muscle in the back of the forearm that extends the wrist, fingers and thumbs.

Complaint: Person is unable to use the hand or extend the wrist, fingers and thumb.

Palpation of the nerve: Both the person and examiner facing each other.

- To palpate nerve in the left hand. Ask the person to flex left forearm. Hold the forearm at wrist and rotate it slightly internally by the left hand.
- Using the pulp of index and middle finger of the right hand, feel the insertion of deltoid and go behind it to feel the nerve passing obliquely in the radial groove (Fig 6.49).

Fig. 6.49 Palpation of radial nerve in oblique groove

Area of sensory loss: Skin on the back of the hand as shown in Fig. 6.50.

Muscle Wasting: Muscles at the back of the forearm are atrophied.

Motor loss: Inability to extend the hand at wrist and extend all the fingers and thumb.

Deformity: Wrist drop (inability to extend the hand at wrist, Fig 6.15).

Fig. 6.50 Area of Sensory supply by radial nerve

VMT of Radial Nerve

- Test dorsi-flexion of hand at wrist
- Ask the patient to put out the hand with palm facing down.
- Support the hand by holding forearm.
- Ask the person to make a fist and then dorsi-flex the wrist (Fig. 6.51).
- Press the hand downwards as shown in the diagram while the patient tries to hold it in the test position (Fig. 6.52).

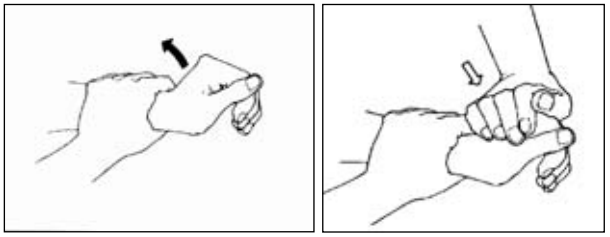


Fig. 6.51 & 6.52 VMT for radial nerve

Grade the muscle power as 'S', 'W', or 'P' as described above.

B) Nerves of the Lower limb

Most commonly affected nerves in the lower limb in Leprosy are lateral popliteal nerve, branch of common peroneal nerve and posterior tibial nerve, a branch of tibial nerve.

6.10.4 Lateral popliteal nerve

The lateral popliteal nerve (a branch of common peroneal nerve) gets affected at the knee. During early stages of involvement, patient may **complain** that big toe gets in way while walking, and may find running difficult, due to weakness of big toe.

Site of palpation: It can be palpated at the back of the knee, behind the head of fibula as it winds around the neck of fibula, and traced upwards to the popliteal fossa.

Position of patient: Patient standing with knees slightly flexed (not total) and examiner squatting.

- Trace fibula upwards on the lateral aspect of the leg to identify the head of fibula in line with lower end of patella (Fig. 6.53).
- Pass backwards and feel the nerve just behind the fibular head (Fig. 6.54).
- Gently palpate with pulp of 2 fingers (index and middle) and feel across the nerve, constantly watching facial expression for signs of tenderness. The palpable course of the nerve is very short.

Fig. 6.53 & 6.54 Palpation of lateral popliteal nerve

Area of sensory loss: Lateral popliteal nerve supplies a large area on the outer side of the leg and dorsum of the foot (Fig. 6.55 & 6.56). As the cutaneous branch of the nerve is more commonly affected in Leprosy; sensory loss in this area does not necessarily indicate damage to nerve trunk or weakness of muscles supplied by it.

Muscle wasting: flattening of the muscle bulge in the upper part of the front of the leg and tibia becomes prominent.

Fig. 6.55 & 6.56 Area of Sensory supply by common peroneal nerve

Motor loss: Common peroneal nerve supplies the muscle in front of the leg that lifts the foot and, muscles on the outer side of the leg that turn the foot outwards. Person may not notice any disability until nerve is completely paralysed or may complain that the foot drags on the floor on sudden attempt to move forward quickly.

Deformity: Foot drop. Person is unable to dorsi-flex the foot at ankle joint (Fig. 6.57). Ask patient to walk a few steps and observe. Person lifts the affected foot high to clear it from the ground (high stepping gait)

Fig. 6.57 Foot drop right foot

VMT for lateral popliteal nerve - Foot up test:

- **Position of the patient:** Ask the person to lift the foot off the ground and support at calf region or make the person sit on the stool so that the legs are hanging.
- Ask the patient to dorsi-flex the foot fully.
- Push the foot downwards while the patient tries to hold it in the test position (Fig. 6.58).
- Grade the muscle power as S', 'W', or 'P' as described above

If foot can be pushed down easily, there is muscle weakness. If the patient cannot lift the foot at all, there is paralysis.

Fig. 6.58 VMT for lateral popliteal nerve

6.10.5 Posterior Tibial nerve

Posterior tibial nerve is branch of the common tibial nerve and is palpable at a site just below and behind the medial malleolus, approximately at the mid point between medial malleolus and heel. Posterior tibial nerve involvement does not experience any noticeable disability in the early stages. Later it produces claw toes and plantar anesthesia.

Area of sensory loss: This nerve supplies the skin of the entire sole (Fig. 6.59).

Fig. 6.59 Area of Sensory supply by posterior tibial nerve

Site of palpation: Below and behind the medial malleolus, approximately at the mid point between medial malleolus and heel.

- Ask the patient to keep the leg on the knee of the other limb. Fix the ankle by flexing the foot by exerting slight pressure on toes. Identify the medial malleolus. Locate the nerve just below and behind medial malleolus (approximately at the mid point between medial malleolus and heel (Fig. 6.60).
- Palpate with the pulp of the finger and feel across the nerve constantly watching facial expression for signs of tenderness.
- The palpable course of the nerve is very short.

Fig. 6.60 Palpation of posterior tibial nerve

Deformity: Clawing of toes. When the foot is placed flat on ground there is hyperextension at the metatarso-phalangeal and flexion at the interphalangeal joints so that instead of the pad of the toes, tips of the toes come in contact of the ground (Fig. 6.61).

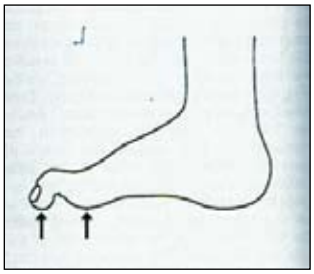
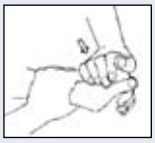
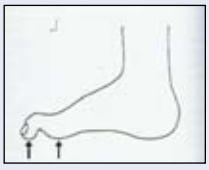


Fig. 6.61 Claw toes

Test for early muscle weakness: Nerve supplies the small muscles of the foot and there may not be any noticeable disability due to involvement of this nerve. However, spreading of toes against resistance can be tested (Fig. 6.62).

Fig. 6.62 VMT for posterior tibial nerve

Table 6.2 Commonly affected nerves

Peripheral nerve trunk	Sensory supply	Palpation	Voluntary Muscles Testing (VMT)	Deformity
Ulnar Nerve	Little finger, medial ½ of ring finger & corresponding medial portion of palm and back of hand	Just above the elbow & behind the medial epicondyle	little finger out test	Claw deformity of little and ring finger
Median Nerve	Lateral 3 ½ fingers & corresponding lateral portion of palm	At the wrist medial to palmaris longus	Inability to abduct thumb Thumb up test	Claw deformity of thumb, index finger and middle finger (usually not seen alone)
Radial Nerve	Lateral 2/3 of dorsum of hand	Oblique groove in Arm	 Test dorsiflexion of wirst	Wrist drop
Common peroneal nerve (Lateral popliteal) nerve	lateral leg & dorsum of foot	Posterior to neck of fibula	Dorsiflexion of foot	foot drop
Posterior tibial nerve	Sole of the foot	Below and behind medial malleous	Spreading of toes	 Claw toes

6.11 Grading of disability

Disability must be assessed, graded and recorded at the time of first examination and periodically at subsequent visits. Risk status of the affected person changes with the disability status of the person.

Disability in Leprosy is graded to judge the extent of impairment, progress, early detection of any deterioration in the disability status of the Leprosy affected person, to decide the line of management for the person, to monitor the quality of services available and plan services for the management of the Leprosy in the area.

The EHF score is used to grade the disability of the individual organ separately and to give an over all disability grade to the person as outlined below.

Table 6.3 Showing EHF score

Examination of parts	WHO Disability Grades	Sensory Testing (ST)	Voluntary Muscle Testing (VMT)	
Hands				
	0	Sensation present	Muscle power normal (S)	
	1	Sensation absent	Muscle power normal (S)	
	2	Sensation absent	Muscle power weak or paralysed (W/P)	
Feet				
	0	Sensation present	Muscle power normal (S)	
	1	Sensation absent	Muscle power normal (S)	
	2	Sensation absent	Muscle power weak or paralysed (W/P)	
Eye		Vision	Lid Gap	Blinking
	0	Normal	No lid gap	Present
	2	Can not count fingers at 6 metres	Gap between eyelids present /red eye/ corneal ulcer or opacity	Absent

EHF score is the sum of the individual disability grades for each eye, hand and foot

The highest grade of disability given in any of the part is used as the Disability Grade for that patient. EHF score i.e. sum of all the individual disability grades for two eyes, two hands and two feet (0–12) should be recorded at each examination.

The EHF score is calculated from data being recorded routinely. Since the disability grade can be scored as 0, 1 or 2; EHF score, the sum of all the individual disability grades for the two eyes, two hands and two feet, ranges from 0 to 12. A score of 12 indicates grade 2 disability of both eyes, both hands and both feet. The EHF score is more sensitive to change over time than the Disability Grade itself. The simplest way to use the EHF score to calculate the score at the time of diagnosis and record the findings of the examination in the disability Assessment Form (P- II) separately for right and left eyes, hands and feet and give separate grade to each eye hand and foot. Write the date of assessment on the form.

After assessment of disability grade, record the grade of disability in the treatment register and patient card. Person with disability need frequent monitoring and called for follow up fortnightly till on steroid and assessed for any deterioration in the disability status and if possible every three months for one year and every six months for next two years after stopping the treatment. The current score is compared with that at the previous visit. An increase in the score, whether of an individual organ or the over all score would indicate some new or additional disability.

Assessment of Nerve Function must be done at least every three months during treatment with MDT

6.12 Assessment of risk status

Patients at high risk for developing disability

People with following features are more likely to develop lepra reaction and neuritis compared to others.

- Multi bacillary Leprosy
- Multiple skin patches
- Past or present thickened/painful/tender nerve trunk
- Past/present reaction, lesion near/on the nerve trunk
- Skin lesion on face
- Pregnancy with or without thickened nerve trunk

Refer to table in section 10.2 for risk status, its monitoring and management

6.12.1 Counselling of high risk persons

Persons at high risk of development of reactions and disability need frequent counselling and monitoring. They are counselled at the time of registration, during and on completion of treatment regarding possible signs and symptoms of reaction and need to report immediately for treatment/ appropriate referral for prevention of further damage. They are advised to report immediately in case of any nerve pain, loss of sensation, weakness of muscles, appearance of numbness tingling/ paraesthesia in the hand, face and foot and also involvement of eye. Those who come with disability are told how to take care of themselves and to recognize signs and symptoms of worsening of disability.

6.12.2 Frequent monitoring of high risk persons

Identified high risk people are monitored more frequently, at regular intervals, for early detection of impairment of nerve function. They are assessed on every visit to health centre i.e every month or at earliest sign of clinical deterioration (skin or nerve lesions), while taking MDT and even after completion of MDT treatment (three monthly in the first year and subsequently six monthly for another two years). Examine persons affected by Leprosy for development of lepra reaction (refer lepra reaction), neuritis, any nerve function impairment (refer involvement of nerve, examination of nerve function including sign for recognizing early nerve damage) and involvement of eyes (Refer ocular Leprosy and pathogenesis, involvement of eye, examination of eye, examination of individual nerves). Assess the disability status and record the findings.

People with lepra reaction and acute neuritis are treated with rest to the affected part, analgesics and steroids (Refer section on lepra reaction).

6.13 Interpretation of signs and symptoms – Assessing disease activity

Monitoring of disease in a person under treatment is done by recording the clinical findings, comparing the finding with that of previous visit, interpreting finding to assess the activity of disease, potential for disabilities (at risk of developing disability), presence of reactional state, reversibility of nerve damage and to decide further management needs of the patient. Signs of active skin lesions are given below.

Table 6.4 Signs of activity of the disease

Signs of Activity in Leprosy		
Clinical Signs	Skin lesions	Infiltration palpable in lesion, raised margin, Erythematous (redness) lesions Expanding/enlarging lesion Appearance of new lesion
	Nerves	New area/increase of sensory loss New nerve involvement (thickening) New motor loss (new/increased muscle weakness)
Bacteriological		Increased proportion of solid bacilli (M.I.) Increase in B.I. (2+ or more)
Pathological		Well formed granuloma in biopsy Solid staining A.F.B.
Above mentioned features may be present at the end of Fixed Duration Therapy but slowly disappear with time. These features may reappear in relapse.		

Disabilities of recent origin (< 6 months duration) will require prednisolone therapy along with MDT (if course of MDT not completed earlier). **Disability of more than six months duration, are referred to identified higher centre,** immediately after registration.

6.14 Recording of findings

Clinical finding of all the Leprosy cases must be recorded in the case card (LF -01). If persons affected by Leprosy has come for the first time, register as new case in treatment register. If the person has defaulted from course of MDT and has returned to resume treatment /MDT the person needs to be re-entered in the treatment register as "other cases". Record the details of clinical examinations of nerve function impairment in form P-II and grade of the disability and note it in the patient card, as well as, in the treatment register. (For recording formats refer to Annexure XV)

6.15 Slit skin smear examination

Note :

- **Diagnosis of Leprosy must be based on "Cardinal signs"**
- **Suspected/doubtful case should never be registered for treatment**
- **Skin smear examination is done to confirm doubtful cases, not confirmed by other two cardinal signs**
- **In the absence of all the three "Cardinal Signs", consider diagnosis of other diseases**
- **If still in doubt re-examine for cardinal signs after 3–6 months**

If there is no objective/demonstrable loss of sensation in the skin lesions and no palpably enlarged nerves, but there are suspicious signs, such as diffuse infiltration of the skin, papules and/or nodules on the earlobes, face, back and limb extensors, it is important to try and get a **slit skin smear test** done. In these circumstances, a positive skin smear confirms the diagnosis of Leprosy **(the third "Cardinal Sign").** In such a situation the Medical officer should take the opinion of a more experienced expert/dermatologist. An alternative diagnosis may also need to be considered. If still

in doubt, wait for a period of 3–4 months and review for loss of sensation and/or thickened nerve that may have appeared by this time. The person will need referral to an appropriate centre for bacteriological examination.

Indications for slit skin smear examination:

1. Diffuse infiltration without any sensory impairment or with vague sensory impairment.
2. Innumerable bilaterally symmetrical ill defined macular lesions without any sensory impairment or with vague sensory impairment.
3. Papules, plaques or nodules on the earlobes, face, back and extensor surface of the limbs without any sensory impairment or with vague sensory impairment.
4. Clinical situations where it is unclear whether the person is suffering from PB or MB Leprosy.
5. Person presenting with fresh lesions after release from treatment.

Bacteriological Examination:

- **Majority of persons affected by Leprosy can be diagnosed without bacteriological examination**
- **Bacteriological examination is not mandatory to start treatment of Leprosy**
- **If required, facilities for bacteriological examination (skin smear examination) are available at District Hospitals, Referral centre of NGOs, Medical colleges etc**

6.16 Diagnosis of Relapse

Relapse is defined as the re-occurrence of the disease at any time after the completion of a full course of treatment. Relapse is indicated by the appearance of new skin lesions and in cases of MB Leprosy, by evidence on a skin smear of an increase in Bacterial Index of 2+ or more. However, for most of the patients, smear examination normally would not have been done at the time of registration and RFT. It is often difficult to be certain that relapse has occurred, as new lesions (at previous lesion sites) may also appear in late Leprosy reactions (sometimes lesions previously not clinically obvious become visible during reaction and look like new lesions). **Suspected relapse cases should always be referred to higher centre (with all clinical and treatment records) for confirmation.**

MDT is very effective treatment for Leprosy. If a full course of treatment has been taken properly, relapse is generally rare. The use of a combination of drugs has prevented the development of drug resistance in Leprosy, so cases of relapse can be re-treated effectively with the appropriate MDT regimen depending on the clinical grouping on the basis of the new lesions. MB Leprosy persons with high bacterial index at the time of diagnosis are more likely to come with relapse.

6.16.1 Difference between relapse and late reversal reaction

Suspected relapses are referred to district hospital (secondary level) for further investigations and management.

Table 6.5 Difference between relapse and late reversal reaction

Criteria	Relapse	Late Reversal Reaction (Type 1)
Time since completion of treatment	Variable, usually later	Variable usually early
History of type 1 reaction while on treatment	variable	Usually positive
Progression of signs and symptoms	Slow	Fast
Site of skin lesions	Usually at new places	Usually over old patches
Skin-Pain, tenderness or swelling of patches	No	Yes – skin and nerves
Nerve –Neuritis	Usually absent	May be present

6.16.2 Examination of previously treated person affected by Leprosy

If a person previously treated for Leprosy comes with complaints related to relapse, reaction or disability. Take a detailed history including:

- Details of current problem, its onset, duration, progress, any treatment taken.
- Time of completion of treatment.
- Duration of previous treatment.
- Whether new lesions appeared quickly or over a long period of time.
- Relationship of new skin lesions with old skin lesions.
- Presence of any pain, tenderness or swelling.
- Any recent loss of function of nerve (sensory or motor).
- Presence of red, painful eye and/or watery eyes.
- Any recent deterioration of vision.
- Presence of a newly developed wound or non healing wound.

If suspecting relapse in a person treated for MB Leprosy, arrange for a slit skin smear (refer to higher centre). If skin smear was done previously, and shows an increase in bacterial load compared to the previous smear, relapse is likely.

In case of doubt a short course of steroids as a **'therapeutic trial'** can be given to clarify the diagnosis. Reaction will show improvement within four weeks but relapse will not show any improvement.

Case of relapse is treated as any new case of Leprosy but registered as relapse in the category of "other cases" and not as a new case.

Suspecting relapse:

To differentiate from reaction start prednisolone and immediately refer to District Hospital (secondary level).

6.17 At confirmation of diagnosis of Leprosy

Once diagnosis of Leprosy is confirmed:

- Explain the findings to the person
- Counsel the person and tell them that the disease can be cured.
- Examine the person more thoroughly to find out how far the disease has progressed, to know whether additional treatment is needed.
- Record the finding of the examination.
- Register the person in the treatment register
- Prescribe the appropriate treatment regime.
- Inquire about the person's family.
- Household contacts should be examined for Leprosy.
- Family should be encouraged to help the person complete treatment.

6.18 Ethical responsibility while diagnosing Leprosy

Ethical responsibility in diagnosing Leprosy:

If suspecting Leprosy but can not confirm the diagnosis, do not label a person as a case of Leprosy on suspicion alone

Note: In a person with suspected pale patches but normal sensation look for other cardinal signs

In the absence of other cardinal signs –

- **Inform the person about common signs and symptoms of the disease**
- **Try to extract history of contact**
- **Try to extract history or presence of other associated features**
- **Refer the person to specialist for diagnosis and skin smear examination**
- **Consider the possibility of other disease**
- **If possible may ask person to report back after three months for reassessment**

Chapter 7

Classification & Management of Leprosy

Structure

7.1 Introduction

7.2 Grouping of Leprosy

- 7.2.1 Criteria for grouping

7.3 Treatment of Leprosy

- 7.3.1 Drugs used in MDT
- 7.3.2 Standard Regimen of MDT
- 7.3.3 Duration of Treatment
- 7.3.4 Advantages of Multidrug Therapy (MDT)
- 7.3.5 Assessing fitness of a Leprosy patient for MDT
- 7.3.6 Assigning appropriate MDT regimen
- 7.3.7 Treatment of Leprosy during pregnancy
- 7.3.8 Treatment of Leprosy and tuberculosis
- 7.3.9 Treatment of Leprosy in HIV positive patients
- 7.3.10 Side effects of anti-Leprosy drugs and its management
- 7.3.11 Ensuring regularity of treatment
- 7.3.12 Accompanied MDT
- 7.3.13 Follow up of Leprosy affected person on MDT
- 7.3.14 Completion of treatment with MDT
- 7.3.15 Criteria to restart course of MDT

Learning Objectives

At the end of the session trainees will be able to:

- **Describe principle of using MDT and assign appropriate fixed duration regimen to LAP**
- **Enumerate side effects of MDT and describe the management of side effects**
- **Enumerate Instructions to be given during counseling to ensure regularity and completion of treatment**

Teaching methods: Lecture discussion, demonstration, case studies, exercises

7.1 Introduction

Very effective treatment is available for cure of Leprosy. Person affected with Leprosy is treated with combination of drugs called Multi-Drug Therapy (MDT). MDT is available free of cost at all the health care facilities. Drug is taken orally and is available in blister packs containing drugs for 28 days (four weeks taken as one month of regimen).

7.2 Grouping of Leprosy

To assign the correct regimen for treatment of a Leprosy patient, they are grouped into either Paucibacillary or Multibacillary types of Leprosy, based on the number of skin and nerve lesion and bacteriological status. This is important because it helps in selecting the correct combination of drugs (regimen) for a given person.

7.2.1 Criteria for grouping

Table 7.1 Critera for grouping PB & MB Leprosy

S. No.	Characteristic	PB (Pauci bacillary)	MB (Multi bacillary)
1	Skin lesions	1–5 lesions	6 and above
2	Peripheral nerve involvement	No nerve/only one nerve with or with out 1 to 5 lesions	More than one nerve irrespective of number of skin lesions
3	Skin smear	Negative at all sites	Positive at any site

Note: If skin smear is positive irrespective of number of skin and nerve lesions, the disease is classified as MB Leprosy but if skin smear is negative it is classified on the basis of the number of skin and nerve lesions.

7.3 Treatment of Leprosy

7.3.1 Drugs used in MDT

The treatment of Leprosy is in the form of Multidrug Therapy (MDT), which is the combination of two or three of the following drugs:

- Cap. Rifampicin
- Tab. Dapsone
- Cap. Clofazimine

7.3.2 Standard regimen of MDT

Four types of standard regimens are available in blister packs for treatment of Leprosy

MDT is provided in convenient-to-use blister calendar packs (BCPs) with medicine for four weeks or 28 days, which is loosely referred to as one month. BCPs for PB Leprosy contain two medicines and that for MB Leprosy contain three medicines. BCPs for children contain the same medicines as the BCPs for adults but in smaller doses.

- **PB Adult : For people with PB Leprosy and 15 years of age or more**
- **MB Adult : For people with MB Leprosy and 15 years of age or more**
- **PB child : For people with PB Leprosy and 10–14 years of age**
- **MB child : For people with MB Leprosy and 10–14 years of age**

Blister packs are not available for children under 10 years of age. Treatment of children belonging to this age group is given after calculating the dose according to their body weight. Recommended **daily** doses as **per kilogram** of body weight (kg bw) are:

- **Rifampicin : 10 mg/kg body weight, monthly once**
- **Clofazimine : 1 mg/kg body weight daily and 6 mg/kg body weight, monthly once**
- **Dapsone : 2 mg/kg body weight daily**

7.3.3 Duration of treatment

Leprosy persons with PB Leprosy need 6 months treatment that must be completed in maximum of nine consecutive months. This means PB Leprosy person cannot miss a total of more than three pulses during treatment. MB Leprosy person needs 12 months treatment that must be completed in 18 consecutive months. All the efforts must be made to complete six pulses in 6 months for PB cases and 12 pulses in 12 months for MB cases.

Note: Rarely, specialists may consider treating a person with high bacterial index for more than 12 months; decision is based on clinical and bacteriological evidence.

Table 7.2 Recommended dose of MDT for person affected by Leprosy

Type of Leprosy	Drugs used	Frequency of Administration Adults (children in bracket)	Dosage (adult) 15 years & above	Dosage Children between 10-14 years#	Dosage Children Below 10 year*	Criteria for RFT
MB Leprosy	Rifampicin	Once monthly	600 mg	450 mg	300 mg	Completion of 12 monthly pulses in 18 Consecutive months
	Clofazimine	monthly	300 gm	150 mg	100 mg	
	Dapsone	Daily Once	100 gm	50 mg	25 mg	
	Clofazimine	Daily for adults (every other day for children)	50 mg	50 mg (alternate day, not daily)	50 mg (weekly twice)	
PB Leprosy	Rifampicin	Once monthly	600 mg	450 mg	300 mg	Completion of six monthly pulses in nine consecutive months
	Dapsone	Daily	100 mg	50 mg	25 mg daily or 50 mg alternate day	

* For children below 10 years, doses (as per kg body wt) should be provided loose (capsules/tablets) after opening appropriate BCP.

For children between 10–14 yrs whose body weight is greater than 35 kgs, adult BCP should be given.

7.3.4 Advantages of Multidrug Therapy (MDT)

- MDT kills bacilli (M. leprae) in the body. It stops the progress of the disease, prevents further complications and reduces chances of relapse.
- As the M. leprae are killed, the patient becomes non-infectious and thus the spread of infection in the body is reduced. Moreover, chances for transmission of infection to other persons are also reduced to a considerable extent.

Fig. 7.1 & 7.2 Infiltrative lesions before and after treatment with MDT

- Using a combination of two or three drugs instead of one drug ensures effective cure and reduces chances of development of resistance to the drugs.
- Treatment with multi-drug therapy reduces duration of the treatment.
- Duration of treatment is short and fixed.
- MDT is safe, has minimal side effects and has increased patient compliance.
- Available in blister pack; easy to dispense, store and take.

Fig. 7.3, 7.4, 7.5, 7.6 Effect of MDT on activity of the disease

Indications for prescribing MDT

- **New case of Leprosy:** Person with signs of Leprosy who have never received treatment before.
- **Other cases:** Under NLEP all previously treated cases, who need further treatment are recorded as **"other cases".** It has been decided that all migrant cases from another state reporting at any state Health Institution will also be grouped under this category. Other cases include both PB & MB cases.

Categorization of "other cases" (recorded for PB and MB)

(a) **Relapse Cases of PB/MB:–** Persons who have developed new lesion at any time after the completion of a full course of treatment. Diagnosis must be evidence based and must be made after adequate screening. Cases receive the same treatment as a new case of PB/ MB Leprosy depending on the current classification.

(b) **Reentered for treatment (include defaulters) -** These are previously treated cases, where clinical assessment shows requirement of further treatment and patient admits that treatment was not completed. Defaulters are included in this category. Defaulter is a person who fails to complete the treatment within maximally allowed time framework i.e. six pulses in nine consecutive months for PB Leprosy and 12 pulses in 18 consecutive months for MB Leprosy. On retrieval of defaulter, reassess the person for classification and disability status and start the treatment as a fresh case but register the case as reentered patient (Other cases) and not a new case.

(c) **Referred cases –** Patient referred for completion of treatment (remaining doses) by tertiary or second level institutions after diagnosis and issue of first dose, or from another Health centre on patients request or migratory patient from another District/State. All referred cases should have a referral slip showing diagnosis and remaining doses to be given.

(d) **Change in classification –** Persons with PB Leprosy; reclassified as MB Leprosy due to appearance of more lesions (skin lesions or nerve involvement/ become smear positive) during the treatment is given full course of MB treatment.

(e) Cases from outside the state & Temporary migration or cross border cases.

Before deciding a case to be recorded as from other state, the residential status at the place of diagnosis is carefully examined. A person who has migrated and is residing for **more than six months,** is likely to stay till completion of treatment and recorded as indigenous case and will not be categorized under "other cases".

Information regarding other cases is shown separately in the monthly progress reports. Once it has been decided that a person needs treatment, register the person in Leprosy Treatment register and make the Leprosy Record Card. Take care to indicate type of patient (new/others) correctly. Decide the regimen and counsel the person (Refer section 11.6. and chapter on counselling).

7.3.5 Assessing fitness of a Leprosy patient for MDT

Before starting treatment, you must look for the following:

- **Jaundice:** If the patient is jaundiced, wait till jaundice subsides.
- **Anaemia:** If the patient is anaemic, start treatment for anaemia simultaneously along with MDT.
- **Tuberculosis:** If the patient is taking Rifampicin, ensure that he/she continues to take Rifampicin in the dose required for the treatment of tuberculosis along with other drugs in the regimen required for the treatment of Leprosy.
- **Allergy to sulpha drugs:** If the patient is known to be allergic to sulpha drugs, avoid Dapsone. Refer person for prescription of alternate drug regimen.

7.3.6 Assigning appropriate MDT regimen

Based on the grouping, the patients may be given any one of the standard MDT regimen mentioned below. In children, the dose must be adjusted suitably.

When the patient has completed the required number of doses the treatment is stopped and RFT (Released from Treatment) is written against the name of the person in the Leprosy treatment register.

MDT regimen

First dose containing rifampicin, Clofazimine and Dapsone for MB Leprosy and rifampicin and dapsone for PB Leprosy as indicated in the figure is given once in a month on first day of every month (Day 1 of every BCP) in front of the health worker (under direct observation). Following this daily dose of Dapsone and Clofazimine for MB and only Dapsone for PB Leprosy is taken by the affected person at home for next 27 days. Six such pulses for PB must be completed within nine months or less where as 12 pulses of MB must be completed in 18 months or less.

7.3.7 Treatment of Leprosy during pregnancy

MDT is safe and can be continued during pregnancy.

7.3.8 Treatment of Leprosy & tuberculosis

MDT is continued but rifampicin is omitted from MDT for Leprosy and is given in the doses recommended as per Guidelines of RNTCP (Revised National Tuberculosis Control Programme)

7.3.9 Treatment of Leprosy in HIV positive patients

MDT for Leprosy can be safely given to HIV affected persons and to those on antiretroviral therapy.

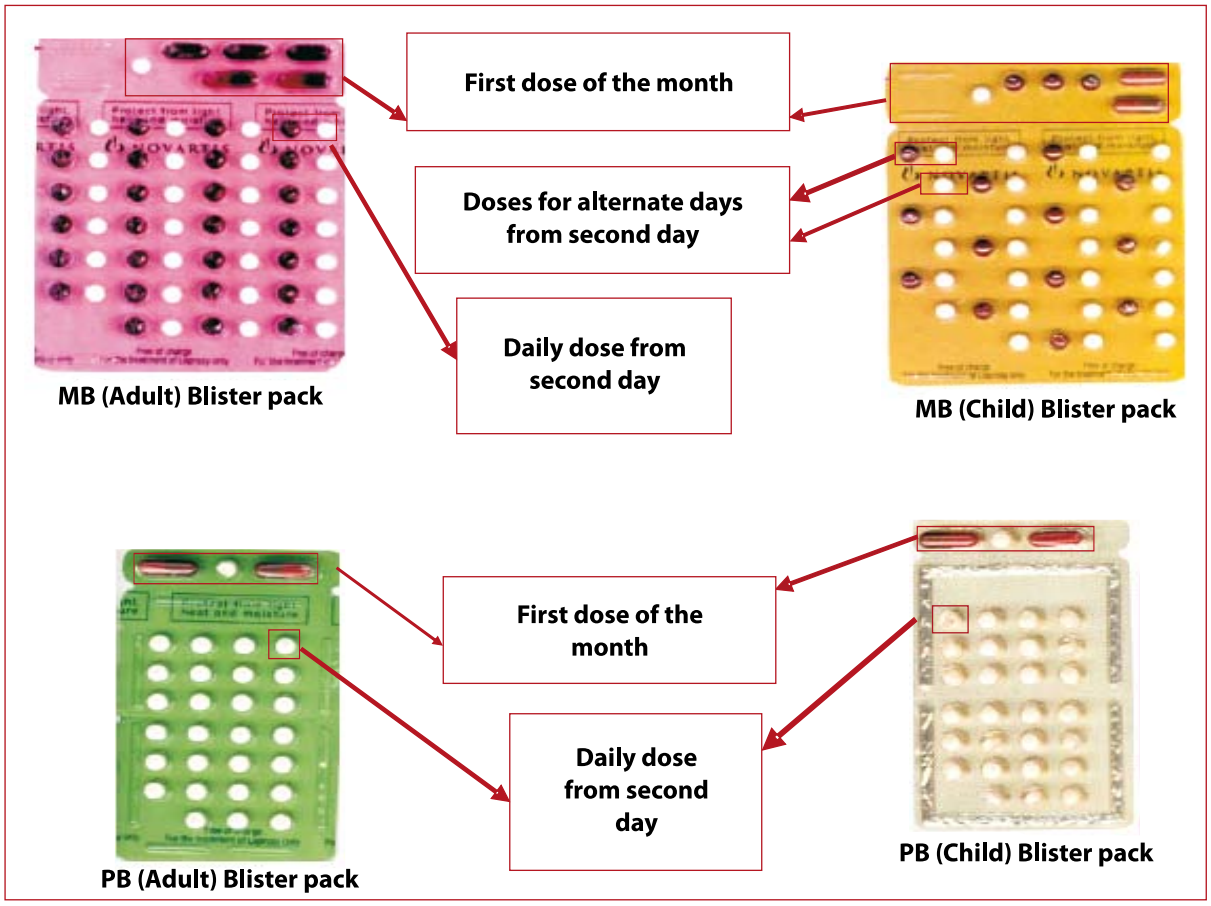


Fig. 7.7 Four types of MDT Blister Capsule Packs

7.3.10. Side effects of anti-Leprosy drugs and its management

Table 7.3 Side effects of Dapsone

	Common side effects	Signs and symptoms	What to do if side effects occur
Minor	Anaemia	Paleness inside the lower eyelids, tongue and fingernails, Tiredness, oedema of feet and breathlessness	Give anti-worm treatment and iron and folic acid tablets. Continue dapsone.
	Abdominal symptoms	Abdominal pain, nausea, and vomiting with high doses	Symptomatic treatment. Reassure the patient Give drug with food
Serious	Severe skin complication (Exfoliate dermatitis) Sulphone hypersensitivity Haemolytic anaemia	Extensive scaling, itching, ulcers in the mouth and eyes, jaundice and reduced urine output Itchy skin rash	Stop Dapsone. Refer to hospital immediately. Never restart.
	Liver damage (Hepatitis)	Jaundice (yellow Colour of skin, eyeballs and urine) Loss of appetite and vomiting	Stop Dapsone. Refer to hospital. Restart after the jaundice subsides
	Kidney damage (Nephritis)	Oedema of face and feet. Reduced urine output	Stop Dapsone. Refer to hospital

Dapsone may cause haemolysis of red blood cells. People with glucose-6- phosphatase dehydrogenase deficiency are more susceptible to haemolysis. It is usually mild and symptom less. Methaemoglobinaemia may also occur due to dapsone therapy. Lips and nails may develop blue hue that may disappear spontaneously or on reducing the dose and is not an indication to interrupt therapy. Both are rare in therapeutic doses used for Leprosy.

Table 7.4 Side effects of Rifampicin

	Side effects	Signs and symptoms	What to do if side effects occur
Minor adverse effects	Red discoloration of body fluids	Reddish coloration of urine, saliva and sweat	Reassure the patient and continue treatment
	Flu like illness	Fever, malaise and body ache	Symptomatic treatment
	Abdominal symptoms	Abdominal pain, nausea, and vomiting	Symptomatic treatment. Reassure the patient Give drug with food
Serious adverse effects	Hepatitis (liver damage)	Jaundice (yellow colour of skin, eyeballs and urine). Loss of appetite and vomiting	Stop Rifampicin. Refer to hospital. Restart after jaundice subsides.
	Allergy	Skin rash or Shock, purpura, renal failure	Stop Rifampicin

Table 7.5 Side effects of Clofazimine

Side effects	Signs and symptoms	What to do if side effects occur
Skin pigmentation (Not Significant)	Brownish-red discoloration of skin, urine, and body fluids	Reassure the patient, it disappears after completion of treatment
Acute Abdominal symptoms	Abdominal pain, nausea and vomiting on high doses	Symptomatic treatment. Reassure the patient Give drug with food If intractable stop clofazimine
Ichthyosis (diminished sweating)	Dryness and scaling of the skin, itching	Apply oil to the skin. Reassure the patient.
Eye	Conjunctival dryness	Moistening eye drops/frequent washing of eyes

NOTE:

1. In case of urticaria or drug rash stop both Dapsone and Rifampicin and refer to hospital.
2. Stop both dapsone and rifampicin in case of hepatic/renal symptoms and clofazimine in severe gastritis.

7.3.11 Ensuring regularity of treatment

Counsel the person adequately regarding the disease, its curability, duration of treatment and importance of regular and complete treatment. Encourage the person constantly to complete the treatment.

- Tell the basic facts about the disease e.g. disease is curable, skin patches may not disappear or take some time to disappear after the completion of the treatment.

- Explain the method of taking drug. Ask person to swallow first dose in front of the health worker/doctor (Assign a person to observe intake of first dose).
- Tell them that medicine is to be collected every 28 days (better to collect 1-2 days in advance).
- Tell the person about possible side effects and when to report.
- Encourage person to ask questions
- Ask person to bring the previous blister pack
- Every time patient comes to collect medicine, examine and assess for any complication or worsening of disability.
- Contact the person who has not reported to collect the monthly blister pack with the help of your team members or members of the community. Find out the reason and try to find a solution to the patient's problem. Reasons for interruption of treatment may be many like:
  - Poor accessibility of the clinic (Distance/connectivity/timings)
  - Difficulty in taking time off work.
  - Lack of understanding about disease and importance of regular treatment.
  - Stigma often fed by negative attitude and fear in the community.
  - A poor relationship with health care providers.
- Adopt, accompanied MDT, whenever it is essential.
- Ensure timely release from treatment of MDT.

If a Patient has discontinued treatment, they can still continue with the course as long as they have not missed:

- **More than three months of treatment for PB regimen**

or

- **More than six months of treatment for MB regimen**
- **Such Patients should be reassessed clinically to ascertain the group and**
- **Start the whole course of treatment again or as per expert's recommendation**

7.3.12 Accompanied MDT

Some people may find it difficult to come to the clinic every month especially people from remote areas or areas that are cut off during rainy season, or from areas with law and order problem. These patients are given more than one blister pack at a time. In this case, make sure that patient understands how to take the medicine. If possible, take help of another person (a family member, a reliable neighbour or a health worker) who can help the patient in taking the treatment regularly.

Encourage regular and complete treatment:

- **Patients who are not collecting drug on time should be contacted immediately to identify the reasons and take corrective actions**
- **Flexibility in MDT delivery (more than one pulse at a time) may be adapted whenever it is essential**

7.3.13 Follow up of patient on MDT

When ever a patient comes to the PHC, reassure the patient, ensure regularity of treatment and look for side effects of MDT or sign /symptoms of reaction/ Neuritis.

7.3.14 Completion of treatment with MDT

- Skin lesions due to Leprosy may not disappear immediately on completion of fixed duration treatment with MDT. In some people, light-coloured patches remain on the skin permanently. Persons with residual patches at the time of completion of treatment must be told this, otherwise, they may not understand why their treatment has been stopped and may try to take treatment from somewhere else.
- Loss of sensation, muscle weakness and other nerve damage may also remain. Educate the patient about the difference between persistence of light-coloured patches or loss of sensation despite successful therapy as an expected outcome, appearance of new lesions or new sensory loss, nerve involvement, ocular involvement or other signs and symptoms of reaction as danger signs for which the person should report immediately.
- Ensure that person with disability knows about "self care" for prevention of disability or it's worsening. For self care refer chapter on POD.

After the completion of the course of MDT, new nerve damage/Reaction may appear:

- **Do not start MDT for such patients**
- **Treat such persons for reaction (Refer Leprosy Reaction)**

- Ask persons with low risk for development of reaction/disability to report immediately on appearance of any of the signs/symptoms and people with high risk to come for follow up after three months for first year after completion of treatment and every six months for next two years. Those taking steroid therapy are asked to come after two weeks.

After completion of treatment, a very small number of patients may get new skin patches because of relapse. Refer such Persons affected by Leprosy to referral centre for confirmation of relapse and treatment.

7.3.15 Criteria to restart course of MDT

- On **relapse** of disease, MDT is restarted. Relapse must be differentiated from Leprosy Reaction.
- **Drop out** cases that discontinued MDT for more than three months in PB and more than six months in MB Leprosy regimen, restart treatment as other cases.
- If any **new lesion reappears** after completion of full course of MDT. Refer the case to identified referral centre for confirmation of relapse.

Chapter 8

Leprosy Reaction and its Management

Structure

8.1 Introduction

8.2 Risk for developing reactions

8.3 Types of reactions

- 8.3.1 Type 1 reactions
- 8.3.2 Type 2 reactions
- 8.3.3 Clinical Difference between Type 1 and Type 2 reactions
- 8.3.4 Mild & Severe Leprosy reactions

8.4 Diagnosis & examination of the person with lepra reaction

- 8.4.1 Differential diagnosis
- 8.4.2 Early diagnosis of reactions

8.5 Management of Reactions

- 8.5.1 Management of mild reactions
- 8.5.2 Management of severe reaction
- 8.5.3 Management of severe type 2 reaction
- 8.5.4 Recording steroid treatment
- 8.5.5 Treatment with surgery
- 8.5.6 Counselling of person in reaction

8.6 Precautions During Treatment with Systemic Steroids

- 8.6.1 Monitoring of the patient for side effects of prednisolone

8.7 Counselling persons affected by Leprosy in reactions/steroid therapy

- 8.7.1 Counselling patients at start /during steroid therapy
- 8.7.2 Counselling patients & follow-up on completion of treatment with steroids

8.8 Referral of patient in reaction

- 8.8.1 Referral before starting treatment with steroids
- 8.8.2 Referral during steroid therapy
- 8.8.3 Referral after completion of treatment with steroids.

8.9 Management of person with interruption of steroid therapy

8.10 Assessment of requirement of prednisolone tablets for Leprosy reactions

Learning Objectives

At the end of the session trainees will be able to:

- **Describe criteria and identify early reaction/neuritis**
- **Describe high risk persons affected by Leprosy for development of reactions**
- **Describe management of persons affected by Leprosy with reaction**
- **Describe principles of management of neuritis**
- **Describe monitoring of persons affected by Leprosy with reaction/ neuritis**
- **Enumerate conditions for referral of persons affected by Leprosy with reaction**

Teaching method: Lecture discussion using power-point Presentation, case demonstration.

8.1 Introduction

Though Leprosy is a chronic disease, sudden appearance of signs and symptoms occur during reactions. Skin and nerve lesions become inflamed and nerves may become extremely painful and tender due to acute neuritis:

- Occurrence of reactions is one of the characteristics of Leprosy.
- Long term problems related to Leprosy (disability) are due to damage from Leprosy reactions.
- Reactions occur due to abrupt change in immunological response of the body against M. leprae. Severity of reaction depends on –
  - Presence of bacterial load in the body of persons affected by Leprosy.
  - Strength of immunological response of the persons affected by Leprosy.
- Both Pauci-bacillary and Multi-bacillary persons affected by Leprosy, have some risk for developing reaction (either type1 or type 2).
- Leprosy reaction can develop at anytime i.e.
  - Onset of the disease/before starting the treatment
  - During treatment
  - After completion of the treatment

Fig. 8.1 Raised active patch with satellite lesion in reversal reaction

Patients developing reactions are at a higher risk of developing disabilities and deformities compared to people who do not develop reaction.

8.2 Risk for developing reactions

Though any persons affected by Leprosy can develop reaction, some are more prone/predisposed. People having few skin lesions and no nerve enlargement are at low risk of developing reactions.

Persons with following features are more likely to develop reactions:

- **Multiple lesions**
- **Lesions close to the peripheral nerve (predisposes to neuritis)**
- **Lesions on the face**
- **People with nerve thickening with/without functional impairment (including thickening)**

Reaction precipitating factors:

- **Infections and infestations**
- **Vaccination**
- **Hormonal changes: Puberty, Pregnancy and Childbirth**
- **Psychological stress**

These patients should be monitored more frequently for early detection of reaction and its prompt management.

8.3 Types of Reactions

There are two types of Leprosy reactions:

(1) Type 1 Reaction: Also called Reversal Reaction can occur in any patient with unstable CMI

(2) Type 2 Reaction: Also called Erythema Nodosum Leprosum (ENL) occurs in patients with MB Leprosy having a heavy load of bacilli

Both the types of reaction can be either mild or severe, clinically.

8.3.1 Type 1 reactions

Occur both in PB and MB Leprosy.

Cause: It occurs as a result of increased activity of the body's immune system, particularly cell mediated immune response fighting the Leprosy bacillus or remnants of dead bacilli.

Clinical presentation Reaction may be the first presenting sign of the disease and usually last for few weeks to few months.

General condition: General condition of the patient is satisfactory. Usually there is no fever and patient does not feel ill.

Inflammation of skin lesions: Signs of inflammation are seen in the existing skin lesions i.e. skin lesions become red, more prominent, swollen, shiny and warm. Lesions are usually not painful but some discomfort may be felt. Sometimes, only few patches are inflamed (Fig. 8.2 & 8.3).

Fig. 8.2 & 8.3 Raised active patch in reversal reaction

Appearance of new skin lesions: Some previously unnoticed or non visible patches may become visible, giving an impression of appearance of new skin lesions. Some or all of these new lesions may be inflamed.

Inflammation of nerves: Nerves are frequently affected in type 1 reaction.

- **Acute Neuritis:** Existing involved or new nerves become enlarged, painful/tender and their sensory, autonomic and motor functions get affected. Pain in the nerve is due to increased intraneural pressure because of oedema and cellular reaction of inflammatory process and gets aggravated when swollen nerve trunk becomes entrapped in bony or fascial tunnel. Pain may even be felt in the region supplied by the nerve (referred pain). Some times, involvement of nerve may be the only presenting feature of reaction without presence of any visible skin lesions.
- **Silent neuropathy/quiet nerve paralysis:** Sometimes, nerve function may get affected without any pain or tenderness of the nerve or inflammation of skin lesions making it much less obvious. It is seen infrequently. However, these patients need to be identified early and treated with corticosteroids.

Swelling of hands and feet: Swelling of the limbs and/or face may be present.

Eyes: Ocular tissue is not affected in type 1 reactions but patient may develop corneal anaesthesia and lagophthalmos due to involvement of trigeminal and facial nerves. (Refer POD & chapter on ocular Leprosy).

Involvement of nerve leads to permanent loss of function resulting in disability. Persons affected by Leprosy with severe type1 reactions (Refer table 8.1) should be identified in early stages and referred to higher centre for management.

Table 8.1 Difference between mild and severe Type 1 reactions

Mild Type 1 Reaction	Severe Type1 Reactions
• Occurs in some of the pre-existing skin lesions only (Other than those on face) • Erythema and swelling of skin lesions without ulceration • Nerves are not affected • No constitutional symptoms • No edema of hands and feet	• Red, painful, inflamed skin lesions with ulceration • Pain or tenderness in one or more nerves with or without loss of nerve function • An erythematous, swollen skin patch on the face around the eye • Skin lesion overlying major nerve trunk • Constitutional symptoms • Marked oedema of the hands, feet or face • Clinically mild reaction not responding to NSAIDs for a period of 2–4 weeks. • Increased or new muscle weakness noticed (motor loss)

8.3.2 Type 2 reactions

Patients having high load of Leprosy bacilli as in Multi- bacillary/ infiltrative type of Leprosy get type 2 reaction. Type 2 reaction can involve multiple organs & systems, causing generalized symptoms.

Relation to treatment: It may occur in the early stages of treatment and even after completion of the treatment with MDT, because body takes a long time to clear the dead bacilli within the macrophages. Type 2 reaction commonly occurs within first three years after the start of Leprosy treatment.

Cause: It occurs when large numbers of Leprosy bacilli are killed, followed by release of their antigens. These antigens from the dead bacilli provoke an arthus type allergic reaction (Coombs and Gell type III hypersensitivity) producing antigen antibody immune complex reaction in the presence of complement system. Immune complexes are precipitated in the tissues (skin, eyes, joints, lymph nodes, kidneys, liver, spleen, bone marrow, endothelium and testes) as well as in the circulation.

Clinical presentation: Type 2 reaction may be the first presenting sign of the disease and usually last for few weeks to several months.

General condition: In the beginning general symptoms like fever, headache and body ache appear before or along with the characteristic nodules that appear on the skin.

Skin lesions: Type 2 reactions exhibit the typical signs of erythema nodosum - red, firm, painful, tender cutaneous and subcutaneous nodules (about 1–2 cm across) and variable sized plaques appear in crops. Nodules blanch on pressure. Usually multiple, they tend to be distributed bilaterally and symmetrically. Nodules are better felt than seen when subcutaneous (Fig. 8.4). They appear preferentially on cooler parts of the skin (found on face and outer surface of limbs and less frequently on the trunk). They usually spare the warmer parts of the body like hairy scalp, axilla, groin and perineum.

Fig. 8.4 Typical ENL lesion

Rarely they can break down and suppurate/necrose producing Erythema Nodosum Necroticans (ulcerative ENL Fig. 8.6). These nodule crops are evanescent, melting away in seven to ten days. When nodules fade these leave bluish/brownish marks followed by brownish hue in the skin. Unlike type 1 reaction, there is no clinical change in the existing Leprosy lesions.

Fig. 8.5 Pustular ENL

Fig. 8.6 ulcerative ENL

Inflammation of nerves: Nerves may also get affected in type 2 reactions.

Differentiating ENL from other diseases: They differ clinically from erythema nodosum seen in other conditions like tuberculosis, streptococcal and viral infections and sarcoidosis, by the fact that the lesions in other cases persist for longer duration **(other lesions last up to 7 days) and requires longer therapy, where as ENL lesions of lepra reactions do not last longer than 2 or 3 days.**

Eyes: Ocular tissue may get affected in type 2 reactions. It may lead to the development of iritis or iridocyclitis (inflammation of the iris and ciliary body, Fig. 8.7) and impairment of vision. Eye becomes red, watery and painful, pupil becomes constricted and non reactive. Colour of iris becomes dull and patient complains of photophobia (pain in the eye when it is exposed to light). Involvement of eye is an emergency and need immediate referral to higher centre.

Fig. 8.7 Ocular lesions iridocyclitis in type 2 reaction

Swelling of hands and feet: Often there is non pitting oedema of face, hands and feet.

Table 8.2 Difference between Mild Type 2 and Severe Type 2 Reactions

Mild Type 2 reaction	Severe Type 2 Reactions
• Intermittent crops of few ENL • Nerves are not affected • Mild fever (less than 100^{0}F) may or may not be present • No other organs involved	• Red, painful, multiple/innumerable ENL in crops • Pain or tenderness in one or more nerves with or without loss of nerve function • ENL that becomes ulcerated (ENL necroticans) • Accompanied by a high fever (>1000F) • Pain and/or redness of the eyes with or without loss of visual acuity (Involvement of eye) • Generalized symptoms with painful swelling of the small joints with fever • Recurrent ENL (more than four episodes in a year) • Clinically mild reaction not responding to NSAIDs and/or within 2–4 weeks. • Enlargement of Lymph glands/testes with pain or tenderness • Involvement of other vital organs like kidneys, liver, bone marrow, endocardium, etc.

Involvement of other organs: In addition, there may be periosteal pain (especially tibiae), muscle pain (myositis), pain and swelling of the tendons and joints, rhinitis, epistaxis, painful dactylitis,

swollen tender lymph nodes especially femoral, acute epididymo-orchitis, hepato-splenomegaly with hepatitis and endocarditis with/without arhythmia. Presence of protein and red cells in urine are seen in glomerulonephritis that may occur due to deposition of immune complex in renal glomeruli.

ENL reaction may become **chronic** (when the condition persist for more than three months in spite of adequate treatment) or **recurrent** (more than four episodes in a year). It may persist for many months; it may get better and/or worse from time to time. A person with type 2 reaction may feel very ill. If not treated in time, involved organ may get permanently damaged and the patient may even die. Severe type 2 reactions (see table below) should be identified early and referred to higher centre for management.

8.3.3 Clinical Difference between Type 1 and Type 2 reactions

Type 1 reaction is localised where as type 2 reactions is more generalized. In Type 1 reaction, the skin lesions themselves become inflamed i.e. red and swollen whereas in Type 2 reaction existing lesions remain unchanged and new firm inflamed red nodules about 1–2 cms in diameter appear under the skin. See table below for details.

Table 8.3 Difference between Type 1 and Type 2 reactions

Signs	Type 1	Type 2
Type of reaction	Cell mediated delayed hypersensitivity	Antigen antibody (Immune complex), reaction
Inflammation of the skin	Skin lesions suddenly becomes reddish, swollen, warm, painful/ tender but the rest of the skin is normal, "fresh" lesions may be noticed	Red, painful, tender, cutaneous/subcutaneous nodules appear (not associated with Leprosy patches). ENL may appear commonly on face, extensor surfaces of arms and legs.
Nerve involvement	Nerves close to skin may be enlarged, tender and painful (neuritis) with loss of nerve function (loss of sensation and muscle weakness) and may appear suddenly/rapidly	Nerves may be affected
General condition (Constitutional symptoms)	Good, with little or no fever or other constitutional symptoms	Poor, with prominent fever and general malaise
Eye involvement	Weakness of eyelid muscles leading to incomplete closure may occur (nerve involved)	Internal eye disease (iritis, irido-cyclitis) occurs, lepromatous nodules are seen.
Other Organs/Tissues	Not affected	May be affected

8.3.4 Mild & Severe Leprosy reactions

Both the type of reaction can be either mild or severe. Presence of one or more of the features mentioned under severe reaction (see earlier tables) means persons affected by Leprosy is suffering from severe reactions and needs treatment with steroids and should be referred to higher medical centre identified for the purpose.

8.4 Diagnosis & examination of the person with lepra reaction

To prevent disabilities and deformities in Leprosy
Diagnose reactions and treat them promptly

Leprosy reactions are diagnosed by clinical examination (described above). Whenever Leprosy affected person is examined, ask for symptoms related to inflammation of skin lesions, presence of cutaneous nodules, pain and tenderness of the nerve, pain & redness in the eye, weakness in hand and feet and inability to close eyes completely.

Consider Reaction on:

- **Sudden appearance of symptoms**
- **Inflammation of existing skin lesions (type 1 reaction) or appearance of painful tender nodules (type 2 reaction)**
- **Inflammation of nerves**
- **Involvement of ocular tissue**
- **Swelling of hands, feet and pain in small joints**

8.4.1 Differential Diagnosis

Common conditions that can be confused with reactions are:

Cutaneous drug reaction: May present variably as exanthemata, urticarial, lichenoid, Erythema nodosum like, Erythema multiforme, Stevens-Johnson syndrome or as Toxic epidermal necrolysis. In some of these reactions the patients complain of itching or burning that is not seen in Leprosy reactions. The fresh eruptions do not correspond to pre-existing skin lesions.

Local infection: Localized pyodermas that develop in Leprosy patients are usually limited to one part of the body and history of cause of infection like injury or insect bite is usually elicitable.

Relapse: Reaction usually occurs within three years of starting anti-Leprosy treatment and is acute in onset with pain and tenderness of the old lesions. In relapse new lesions appear and are insidious in appearance (Refer table 6.5).

Other medical conditions:

- **Diabetes:** Diabetics are prone to infections as well as development of peripheral neuropathy. Further, if given corticosteroids the blood glucose tends to go out of control. All patients should be screened for diabetes and if diabetes is detected, the patient should be referred to an approved higher centre for further evaluation and management.
- **Bell's palsy:** This condition can mimic facial palsy caused by Leprosy reaction. These patients do not have nerve thickening and/or anaesthetic and/or hypopigmented skin lesions. This condition is better managed by an ophthalmologist. In bell's palsy widening of palpebral fissure is not due to sagging of lower eyelid.
- **Rheumatoid arthritis:** This condition can present in women of reproductive age group with skin eruptions, fever, joint involvement, deformities and multiple organ system involvement. RA factor is detectably raised almost invariably. However, sometimes

differentiation of this condition from Leprosy reaction may require referral to higher centre.

- **Rheumatic fever:** Patients may develop fever with joint pains and transient skin rash usually in a young patient. ASO titre will be raised and cardiac valvular involvement may result in detectable murmurs. These patients require consultation/management by specialist.
- **Disk prolapse:** Patient may present with acute onset neuropathy of lower limbs. Patient usually gives history of straining the back or lifting heavy object before the onset. These patients will not have any skin lesion or thickened nerves. They should be managed by an orthopaedic specialist.

8.4.2 Early diagnosis of reactions

Take the following steps for early diagnosis and prompt treatment of Leprosy reactions to prevent development of disability.

- **Diagnose Leprosy early and treat with MDT.**
- **Build capacity of the staff to enable them to identify and refer persons affected by Leprosy with reactions**
- **Counsel persons affected by Leprosy and family members regarding importance of regular and complete treatment**
- **Educate persons affected by Leprosy and family member for signs and symptoms of reaction and neuritis and ask them to report immediately on appearance of these signs and symptoms**
- **Retrieve the defaulter as soon as possible**
- **Monitor and frequently examine high risk persons on monthly interval and others after every three months for early detection of reaction and nerve damage**
- **Timely treatment of reaction and appropriate referral helps in prevention of disability due to Leprosy**

Examine the person with reaction thoroughly to assess the extent of involvement of various systems (refer pathogenesis & diagnosis) and decide whether the reaction is mild or severe in type.

Those at risk of developing reactions or with thickened nerves without any pain/tenderness/ functional impairment are registered for treatment with MDT (if not taken previously), counselled to report immediately on earliest sign of development of reaction and monitored closely.

Principles of Management of mild reactions:

- **Anti-Leprosy drugs to be continued as earlier**
- **Counseling to relieve stress**
- **Treatment of inter-current infections and infestations**
- **Analgesic, anti-inflammatory drugs (NSAIDS)**
- **Anxiolytics (at bedtime)**

8.5 Management of the reactions

8.5.1 Management of mild reactions

Mild reactions are treated symptomatically without steroids. Treatment includes:

- **Reassurance:** Patient is reassured that it will subside within few weeks with medicine.
- **MDT:** Start MDT, if person has come for the first time and MDT not taken previously. People still on anti-Leprosy treatment (MDT) must continue their treatment. However, those who have completed their course of MDT do not need anti-Leprosy treatment while on treatment for reaction.
- **Analgesics and Anti-inflammatory agents:** Mild cases of both the types of reactions are treated symptomatically with NSAIDs like Aspirin (Adult dose 600 mg which can be given upto six times a day)/ Paracetamol (adult dose 1 gm up to four times a day).

Reactions, which are mild (show no signs of severity) and are limited to mildly inflamed skin lesions may be treated symptomatically with Aspirin/Paracetamol.

8.5.2 Management of severe reaction

If any of the features of severe reaction (see earlier tables) are present, treatment with steroids is required. Management of severe reaction includes:

Bed rest: Admission and bed rest for two weeks or more (as required).

Rest to the affected nerve using splint: Rest to the affected nerves is provided by use of static splint. Splint is applied involving joint in the vicinity of the affected nerve. It prevents injury to the affected nerve that may occur due to repeated movement of the joint. While applying splint, affected portion is kept in the functional position. Splint is applied for 24 hrs and removed only for exercise. Initially, person is assisted to carry out gentle passive exercises for the splinted joint where as rest of the adjoining joints are moved twice a day with full range of movement to avoid stiffness. When acute phase is over i.e. pain and inflammation subsides (recovery begins), passive exercises are started to maintain the range of movement of all the adjacent joints. Later, even if there is some permanent nerve damage, active exercises are started to restore strength of the affected muscle.

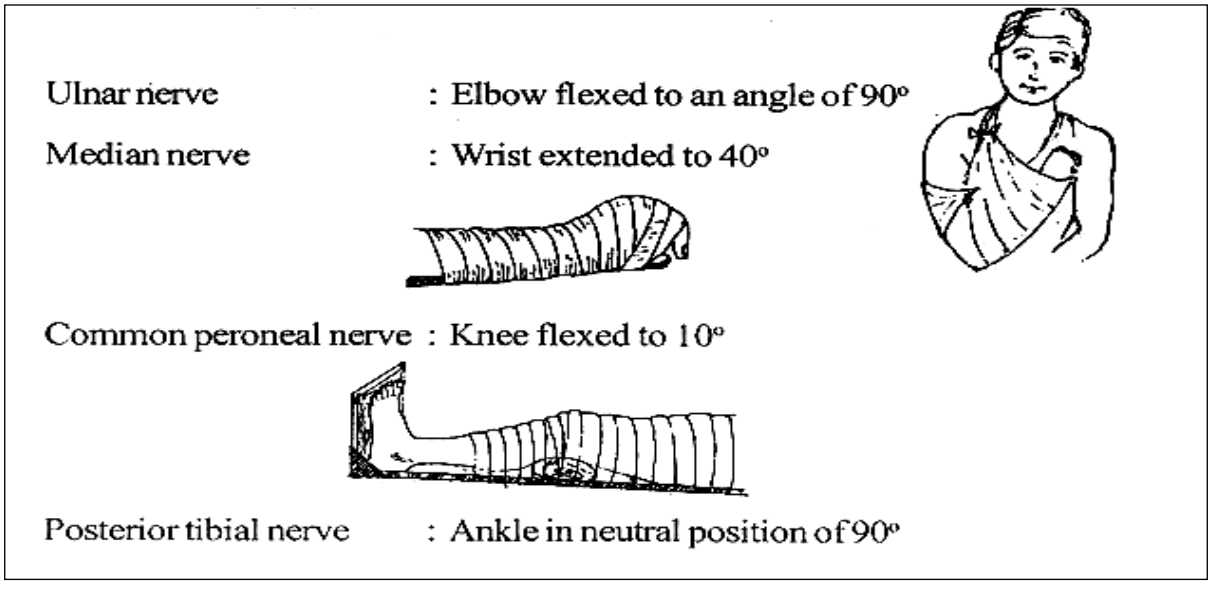


Fig. 8.8 Functional positions for splinting

Analgesics: Analgesics are given as required as described above.

Prednisolone: The main drug for the treatment of severe reactions is corticosteroids.

- It relieves pain and inflammation in the nerve and the skin. Reduction in pain, tenderness and oedema helps in gradual restoration to normalcy. It is easily absorbed when taken orally. It is a very effective drug and its affect starts in a few days. It should never be stopped abruptly.

Fig. 8.9 & 8.10 Type 1 reaction before and after treatment with steroids

- The usual adult dose of steroids to begin with, is 1 mg/kg of body weight to immuno-modulate the reaction. Duration of treatment is 12–24 weeks depending on the severity of reaction and response to the therapy.

Fig. 8.11 & 8.12 Type 2 reaction before and after treatment with steroids

- If inflammation of skin and nerve subsides and there is no new nerve involvement, the dose of Prednisolone is gradually reduced at fortnightly interval depending on the response and eventually stopped (as given below).
- In case of neuritis, (inflammation of peripheral nerve trunk) the period of treatment is prolonged according to the response. From 20 mg onwards (in table below), duration of each dose is increase to four weeks.

Prednisolone is given in the following regime/doses:

Note: Treatment with prednisolone is not linked to MDT i.e. It can be given after adequate MDT is given and stopped.

(i) Start tablet prednisolone(dose at 1 mg/kg body wt/day) is given as a single morning dose after breakfast (consider giving tab ranitidine 150 mg along with prednisolone).

(ii) After the reaction/inflammation is controlled, prednisolone is tapered by 10mg, fortnightly till the dose of 20mg/day.

(iii) Thereafter prednisolone is tapered by 5 mg/day, fortnightly till withdrawal.

8.5.3 Management of severe type 2 reaction

Type 2 reactions can often last for many months so that there is a risk of people becoming dependent on steroids. It becomes difficult to taper steroids and eventually stop the treatment. These patients should be managed in higher referral centres where admission of the patient is possible. Persons who suffer from persistent ENL or who can not be weaned from steroids need drugs other than Prednisolone like higher doses of clofazimine and/or thalidomide for the management of the reaction. Treatment with thalidomide is only recommended in tertiary care hospitals after taking necessary consent. Since this drug is teratogenic, it is contraindicated for use in women of reproductive age group.

Fig. 8.13 & 8.14 ENL necroticans reaction before and after treatment

Clofazimine is given with corticosteroids in every case in the following regime:

One capsule (100mg) 3 times a day x 4 or more weeks (depending on the response) then

One capsule (100mg) 2 times a day x next 4–12 weeks, followed by

One capsule (100mg) once a day x next 4–12 weeks or more

Though Clofazimine is less potent than steroids and often takes 4–6 weeks to develop its full effect; it is extremely useful in reducing or withdrawing corticosteroids in patients who have become dependent on them. Total duration of clofazimine therapy should not exceed 12 months.

8.5.4 Recording steroid treatment

Information regarding Leprosy reaction and details of steroid therapy are filled in Leprosy reaction/ neuritis form (form P-III) kept at the PHC, to monitor the nerve function by comparing the current findings with that of the previous visit. If steroids are being given, record the details in the Leprosy Treatment Register and on the Patient Record Card by red ink. To ensure regularity of the treatment, in people on steroid therapy, who have completed course of MDT, add their names in the treatment register with old registration number in red for the duration of the steroid therapy. Details of the referred person must be recorded in the register (P - V).

8.5.5 Treatment with surgery

Presence of abscess along the course of the nerve needs surgical intervention at referral centre

In some cases of neuritis, despite treatment with steroids for 2–4 weeks; pain persists and there is no improvement in motor function of the involved nerve. To relieve nerve pain and restore nerve function in such cases, nerve pressure is relieved by surgery called nerve decompression. Nerve decompression can be done at referral centre if facilities are available.

8.5.6 Counselling of person in reaction–Refer section 11.6

8.6 Precautions during treatment with systemic steroids

Before starting treatment with steroids take a detailed history and examine the person thoroughly to exclude conditions that are likely to worsen. Treatment for some of these ailments like worm infestation, diarrhea, dysentery, conjunctivitis, fungal infection, scabies and epigastric pain must be started along with the steroids. Persons with conditions like diabetes, hypertension, presence of any infection, red eye, ulcer, osteomyelitis, tuberculosis, and severe depression are referred to higher centre before starting steroid therapy because they need additional resources, precautions and close monitoring during steroid therapy. **Pregnant females and children under 12 years of age also need close monitoring during steroid therapy.**

NOTE: When there are no contraindications to steroids, Mebendazole is given to treat any worm infestation (if not taken during the last six months) and steroids are started.

8.6.1 Monitoring of patient for side effects of prednisolone

Side effects of prednisolone therapy can be serious and sometimes even fatal. Before starting the treatment with steroids, exclude medical conditions that make a person more vulnerable to side effects of steroids and refer such patients to identified referral centre for management.

Person with recent nerve damage not having any of the above mentioned conditions (requiring referral) can be treated with steroids at PHC.

Exclude the following before starting prednisolone (and also monitor after starting steroids):

- **Hypertension,**
- **Diabetes,**
- **Peptic ulcer,**
- **Osteoporosis,**
- **Growth retardation,**
- **Cataracts/Glaucoma,**
- **Weight gain and/or pitting oedema,**

If any of these above conditions are present or suspected, refer the patient to identified referral centre for management.

8.7 Counselling persons affected by Leprosy in reactions/steroid therapy

8.7.1 Counselling patients at start/during steroid therapy

Patients on steroids must be counselled regarding reason for treatment, duration of treatment importance of complete and regular treatment, not to stop treatment abruptly on their own, possible side effects, conditions when they must report immediately.

These persons affected by Leprosy should report to the PHC fortnightly for clinical review and delivery of prednisolone.

8.7.2 Counselling patients & follow-up on completion of treatment with steroids

- People who have been given a course of steroids for reactions or nerve damage are at a greater risk of recurrence of reactions and damage to other nerves. They must be followed closely. Tell all patients that they must report immediately to the PHC/treatment centre; whenever they see any change or recurrence of similar episode.
- People who have not developed reaction but are at high risk of developing reaction must be made aware regarding the condition for which they must report immediately and may be asked to come every three months after completion of MDT course for the next one year.
- Counsel and train the person and one of the family member in self care (Refer POD).
- People who still have lag-ophthalmos (weakness of eyelids) should be referred to a specialised centre.

8.8 Referral of patient in reaction

Patient may need referral before starting the steroid therapy or during the treatment.

8.8.1 Referral before starting treatment with steroids

- If a patient has any relative or absolute contra-indication for steroid therapy he/she should be referred to the appropriate referral centre.

- Eye involvement: must be referred immediately because it may lead to impairment of vision and even blindness.
- Type 1 reaction that occurs after completion of the treatment, must be referred and managed at the referral centre.
- Nerve Abscess: Start anti inflammatory drugs/corticosteroids, provide splint and refer the person.

8.8.2 Referral during steroid therapy

- Patient with neuritis is also referred if condition of the patient does not improve after two weeks of steroid therapy.
- Condition of the patient worsens at any time during treatment.
- Patient develops side effects of steroid therapy that cannot be managed at PHC.
- Any deterioration of general physical condition of the person.

While referring a person on steroid therapy, continue the same dose as is being taken by the person.

8.8.3 Referral after completion of treatment with steroids

- People who still have persistent lag-ophthalmos (weakness of eyelids) after completion of treatment with steroids are again referred to a specialised centre.
- While referring the person, details are noted in the referral register; this would be helpful in keeping the track of the referred person and in providing follow up services to the person according to the Guidelines from the referral centre. Person is also given a referral slip with details of the condition and their treatment. Person would be referred back with details of the follow up treatment required for the concerned person. See referral system chart in annexure II.

8.9 Management of person with interruption of steroid therapy

Some times, patient may not come back for next dose of steroid therapy, try to retrieve the patient with the help of the health worker. Explain the importance of continuing the therapy. Whenever patient returns after interruption in the steroid treatment:

- Assess the nerve function.
- Irrespective of the duration of interruption of steroid therapy; management of reaction depends on the condition of the patient:
- If the original problem does not exist (no sign of reaction/impairment of nerve function). Stop the steroid treatment.
- If nerve damage of less than six months duration and/or sign of reaction still persist, restart the whole course of steroids. Make sure that the person understands the importance of completing the course without interruption.
- If the nerve damage has worsened/duration of nerve damage is for more than six months, restart the course of steroids and refer the patient to higher centre.

8.10 Assessment of requirement of prednisolone tablets for Leprosy reactions

Medical officer needs to indent the prednisolone tablets for the health centre. To calculate the required number of prednisolone tablets.

It is presumed that nearly 10% of the newly detected cases in the preceding year will require steroids and total number of 5 mg tablets of prednisolone required for each case is 336 for recommended standard 12 weeks schedule – starting with 40 mg/day.

Chapter 9 Ocular Leprosy

Structure

9.1 Introduction

9.2 Causes of ocular involvement in Leprosy

9.3 Causes of blindness in Leprosy

9.4 History & Examination of eye

- 9.4.1 History for ocular lesions
- 9.4.2 Examination of eye
- 9.4.3 Lesions due to involvement of ocular tissue
- 9.4.4 Red Eye – Differential Diagnosis
- 9.4.5 Ocular lesions due to involvement of nerves
- 9.4.6 Consequences of nerve paralysis
- 9.4.7 Grading of Disability (WHO)

9.5 Management of ocular lesions in Leprosy

- 9.5.1 Basic principles for management of ocular lesions
- 9.5.2 Management of Episcleritis/Scleritis
- 9.5.3 Management of Acute Dacyrocystitis
- 9.5.4 Management of conjunctivitis
- 9.5.5 Management of corneal lesions
- 9.5.6 Management of Iritis/iridocyclitis
- 9.5.7 Prevention & treatment of lagophthalmos
- 9.5.8 Management of cataract

9.6 Self-Care of eye:

- 9.6.1 Principles of eye care
- 9.6.2 Protect eyes from dryness, sun, dust and injury
- 9.6.3 Early detection of signs of irritation, injury and involvement of ocular tissue

Learning Objectives

At the end of the session trainees will be able to:

- ☞ **Enlist common lesions of ocular tissue in Leprosy**
- ☞ **Describe the precautions one must take as medical officer to preserve vision in a person affected with Leprosy**

Teaching method: Lecture Discussion using power point presentation, demonstration and hand on practice for examination of eye.

9.1 Introduction:

Eye is the most important organ to be affected in the disease process. Eyes are affected by direct invasion of bacilli or during lepra reaction. Most eye complications may lead to visual impairment and blindness. Early detection and appropriate treatment of ocular lesions is essential to prevent blindness. During early stages person with ocular lesions may remain asymptomatic. Hence, routine examination of eye is important for detection ocular lesions.

Preservation of vision is very important in persons affected with Leprosy

9.2 Causes of ocular involvement in Leprosy

Ocular manifestations of Leprosy are due to:

- **Direct invasion of ocular tissue:** Infiltration of ocular tissue by M. Leprae is followed by inflammatory reaction at a much later stage. This inflammatory reaction may result in conjunctivitis, episcleritis, scleritis, keratitis, Iritis &/or Iridocyclitis. It is common in persons with MB Leprosy
- **Involvement of nerves:** Involvement of trigeminal and facial nerves leads to loss of sensation of cornea and weakness of muscles of eyelid (orbicularis oculi) respectively, predisposing eye to exposure keratitis, repeated injury, secondary infection and other lesions. It is more common among PB Leprosy having patch on the face with or without Type 1 reaction (Unilateral) and MB Leprosy of long duration (Bilateral)

Persons with high risk of ocular involvement:

- **Skin lesion on face – PB Leprosy with or without Type 1 Reaction**
- **In untreated MB Leprosy of long duration it is usually bilateral.**
- **Present or past Type 2 reaction**
- **Present or past ocular pathology**
- **Present or past Type 1 reaction and lagophthalmos**

9.3 Causes of blindness in Leprosy

Three major causes of blindness due to Leprosy are:

- **Corneal opacity** due to exposure of cornea associated with lagophthalmos and diminished corneal sensation. Lid abnormalities like entropion and ectropion may also affect cornea.
- **Iridocyclitis and its squelae** especially in persons with multi-bacillary Leprosy.
- **Cataract** as a complication of disease process. It also occurs due to complication of uveal and corneal disease.

9.4 History & Examination of eye

Involvement of eye must be detected in the early stages to prevent impairment of vision and blindness.

9.4.1 History for ocular lesions

While taking history; ask for:

- Any problem in the eye, pain in the eye and blurring of vision
- Duration of the problem and its progress

- Photophobia – Does light makes eye painful (iridocyclitis)/uncomfortable
- Blurring of vision: Does blurring clears on blinking the eye (due to discharge/stickiness of eye)
- Past h/o Red eye and any treatment taken for it
- H/o any surgery in the past for eye problem

Note: While taking history; observe for frequency of **blinking** of the eye.

☞ Count the number of Blinks per minute – each eye separately without the knowledge of the patient.

9.4.2 Examination of eye: Look for the following conditions during examinaiton

9.4.3 Lesions due to involvement of ocular tissue

Changes can be seen in almost all the parts of the eye. Some changes are seen only through Slit-lamp biomicroscope.

Changes that are of importance and can be detected by simple physical examination of eye are described below:

(i) Eyebrows:

- **Thinning of eyebrows** (lateral half)/ complete loss of eyebrows (Superciliary madarosis) due to deep infiltration.

(ii) Eyelids:

- **Thickening of eyelids** occurs due to diffuse infiltration of skin and eyelid structures following invasion by M. leprae and results in loss of elasticity of the skin and heavy **drooping of upper eyelid.**
- **Entropion:** In-turning of eyelid margins
- **Ectropion:** Out –turning of Eyelid margin
- **Macule/nodule** on the eyelids
- **Weakness of eyelid movement**
- **Thin floppy upper eyelid** occurring due to atrophy of the tarsal plate and pre-tarsal muscles rendering eyelid less effective in spreading the tears and cleaning of cornea

(iii) Eye lashes:

- **Scanty, small and thin/ absent eye lashes** due to atrophy of the tissue supporting hair follicles (ciliary madarosis)
- **Trichiasis -** In turning of eye lashes rubbing against bulbar conjunctiva and Cornea. Person with insensitive cornea may ignore the situation and may get **corneal abrasions and ulcers.** Persons must be instructed specifically to look for trichiasis. Corneal ulcer may heal leaving **corneal opacities.**

(iv) Meibomian glands:

- **Dryness of eye** occurs due infiltration and atrophy of meibomian glands resulting in poor quality of tears.

(v) Naso lacrimal Apparatus:

- **Dacyrocystitis:** Blockage of naso-lacrimal duct may occur due to bacillary infiltration in the nasal mucosa. Nasal ulceration/scarring or nasal collapse causes stagnation of the secretions and acute, sub-acute or chronic infection of the lacrimal sac. Pus can be expressed from lacrimal punctum by pressing the fundus of the lacrimal sac between eye and nose, at the medial canthus of the eye. In case of chronic dacryocystitis redness

and/or swelling and tenderness over lacrimal sac (between eye and nose) can be noticed.

(vi) Sclera:

- **Episcleritis:** Benign inflammation of the Tenon's capsule overlying Sclera is called Episcleritis. Hard, dirty yellow nodule, most commonly on upper outer quadrant is seen with or without any symptom. Sometimes, nodules may become inflamed causing epiphora (overflowing of tears), pain and general ocular discomfort. It is a superficial lesion and rarely has long-term complications.
- **Scleritis:** Inflammation of the sclera. Scleritis in Leprosy is found in Multibacillary cases and is associated with iridocyclitis. Eye is painful and tender. Initially, a deep red, tender, scleral patch may be seen. Repeated episodes of scleritis results in scleral thinning and pigmented tissues of the Uveal tract are seen bulging through sclera and is called Anterior staphyloma, which may even perforate (Refer Fig 9.1). Person may complain of severe deep circum-orbital pain radiating back to temple.

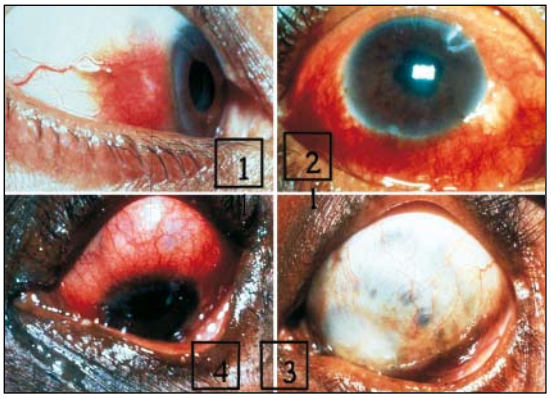


Fig. 9.1 Development of scleritis

To elicit tenderness in the Red eye:

Ask the patient to look down and palpate above the upper tarsal plate through the closed eye

(vii) Conjunctiva:

- **Lepromatous nodule** (ENL) may appear on conjunctiva.

(vii) Cornea: Cornea is directly affected by the bacilli in multibacillary Leprosy. Common corneal lesions are:

- **Superficial punctate keratitis:** Few punctate greyish superficial spots (miliary leproma – aggregation of Leprosy bacilli) like grains of chalk are seen on the cornea especially upper part of the cornea. It is associated with pannus formation (Superficial vascularisation) starting from superior portion of cornea and spreading all around the cornea (Differential Diagnosis- In trachoma, pannus is in the upper part of cornea) Person may complain of mild irritation in the eye and watering.

Fig. 9.2 Superficial punctate keratitis

- **Interstitial keratitis:** A grayish patch is seen extending from limbus towards the centre of the cornea. Sometimes, cornea becomes thickened due to excessive infiltration. Vision is severely affected and may lead to blindness.

(viii) Iris:

- **Iritis:** Inflammation of iris is more frequent and serious condition. Inflammation may also affect the ciliary body resulting in iridocyclitis. **Iritis may be Acute/ Chronic**. Particles resembling chalk particles are seen on the iris, near pupillary margin in early stages called **"Iris Pearls".**

Fig. 9.3 Iritis (Iris Pearls)

- **Acute iridocyclitis:** It is part of ENL reaction (type 2 lepra reaction). Person has photophobia, increased lacrimation, pericorneal redness and blurring of vision. Pupil is small, either sluggishly reactive or non reactive to light. If left untreated may rapidly lead to loss of vision.

Fig. 9.4 Atrophy of the iris (chronic iritis)

- **Chronic iritis:** It is a slow degenerative process. In early stages small round, dull yellow nodule(s) around 0.5 to 1.0 mm in diametre (iris pearls) are seen on the surface of the iris. Chronic iritis may lead to **atrophy of the iris** that presents with dull coloured iris along with pinpoint, non-reactive, irregular pupil due to formation of posterior synaechiae. Person may complain of dull pain in the eye. Person may become blind due to combination of small pupil and mild corneal changes or cataract in the visual axis. Such patients must be referred to ophthalmologist.

(ix) Lens:

- **Opacity of lens** (Cataract) occurs due to intraocular invasion of ocular tissue by bacilli or is made worse by iridocyclitis and/or use of local and/ or systemic steroids. Development of cataract is more common in persons suffering from multi-bacillary Leprosy with evidence of chronic uveitis. Cataract may occur due to any other cause or because of normal ageing process. Person affected with Leprosy can under go cataract surgery with lens implant like any other normal person.

Note: Differential diagnosis of opacity:

Corneal ulcer: Presence of white spot on cornea with redness of eye and photo phobia

Corneal scar: Presence of white spot on cornea without redness and photophobia

Cataract: Opacity behind iris

(x) Intra-ocular pressure

- **Glaucoma:** Intra-ocular pressure may rise in patients treated with cortisone (Leprosy reactions) and as sequelae to repeated iridocyclitis. Topical cortisone administered as eye drops is more dangerous than systemic cortisone.

Digital tonometry: Intraocular pressure can be estimated by digital tonometry. For this, ask the patient to look down, Elicit fluctuation of the globe by placing two index fingers on the lid skin above the tarsal plate of the upper lid; Compare with the other eye.

Prompt recognition and adequate treatment of iridocyclitis is the key to prevent secondary glaucoma and blindness.

9.4.4 Red Eye – Differential Diagnosis

Sign/Symptom	Iridocyclitis	Conjunctivitis	Corneal Ulcer	Acute Glaucoma
Type of redness	Dull red	Bright red	Dull red	Dull red
Location of redness	Peri-corneal redness	Redness more widely spread	Peri-corneal redness	Widely spread
Secretions	No secretions	Secretions present	Watering	Watering
Pain	Present	Absent (only discomfort, no pain)	Present	Present
Photophobia (Inability to open eye in light)	Present	Absent	Present	Present
Anterior Chamber	Normal/ Slightly shallow	Normal	Normal	Very shallow
Pupil	Pin point	Normal in size	Normal	Dilated
Shape of pupil	Irregular	Round and Regular	Round and Regular	Vertically oval and Regular
Reaction to light	Non reactive	Reactive	Reactive	Non-reactive
Iris	Dull coloured	Normal	Normal	Dull
Intraocular pressure	May be high	Normal	Normal	Very high

If Red eye is present:

- ☞ Examine the eye, if diagnosed as conjunctivitis, treat it
- ☞ Refer all other cases immediately to the eye specialist as any neglect can lead to impaired vision and blindness

PAINFUL RED EYE IS AN EMERGENCY

9.4.5 Ocular lesions due to involvement of nerves

Most important nerves to be affected are trigeminal nerve and facial nerve.

(i) Paresis of Trigeminal Nerve

Reduced sensations/loss of corneal sensation (Neuropathic keratitis):
Sensory part of the trigeminal nerve supplies the cornea and part of the facial skin. Damage to the small branches of trigeminal nerve innervating cornea, causes loss of sensation of cornea and affects blinking of the eye. Blinking protects eyes from dryness by spreading tears. It also protects eye from external injuries and wash away dust or dirt and keep the eyes clean.

Testing of corneal sensation is avoided in field conditions. Hence, observation for blinking rate of the eye is done. Irregular/infrequent/absent blinking indicates involvement of trigeminal nerve. (Normal blinking rate is 16–20 blinks per minute)

(ii) Paresis/Paralysis of facial nerve

- **Lagophthalmos/sagging of lower eyelid (Ectropion): Lower eyelid ectropion:** The involvement of Zygomatic and temporal branch of facial nerve causes weakness of orbicularis oculi muscles resulting in incomplete closure of the eye. Lower eyelid is affected first and shows greater degree of paralysis. Involvement of marginal fibres

Fig. 9.5 Sagging of lower eyelids (Ectropion)

of Orbicularis Oculi results in sagging of the eyelid with exposure of the lower palpebral conjunctiva and falling away of the eyelid from the eyeball (Ectropion). This leads to over flowing of tears (epiphora) because punctum and lower canaliculi are not in apposition to the eyeball.

Fig. 9.6 Lagophthalmos right eye

Lagophthalmos may be partial or complete, unilateral/bilateral. In mild cases, weakness of the muscle results in widening of the palpebral fissure with out any other disability. In more severe cases, palpebral fissure is widened and on making an attempt to close the eye, there may be little or no movement of the eyelid but eyeball moves up (Bell's phenomenon). If muscles of the face are not paralysed, eye can be closed using facial muscles exercises. A gap of 1.0 mm or less between the two eyelids is considered normal.

Note: Paresis of strong peripheral preorbital part of the orbicularis oculi muscle is not common and this can be used in deliberate closure of eye by force in the presence of lack of protective blink and serious deficiencies in closure of the eye.

Test the strength of **muscles of the eyelid**.

- Make patient comfortable on stool
- Stand by the side of the person
- Raise chin and ask the patient to close the eyes and keep them lightly closed as if in sleep.
- Look for the gap between the two eyelids. It is considered normal if there is **no gap or gap of less than 1mm** is present. In Leprosy this gap is due to sagging of lower eyelid in the early stages. (DD Bell's palsy)
- To assess early weakness of orbicularis oculi muscle, ask the person to close the eye tightly and try to pull the lower lid down to see whether the patient is able to keep his eyes closed against resistance.

Fig. 9.7 Measuring lid gap

If gap between the two eyelids is **more than 1mm;** see whether person is able to close the eye completely using peripheral part of orbicular oculi muscle (that may remain unaffected) and other facial muscles.

If facial muscles are not weak/paralysed, person is able to close the eye by pushing cheek muscles upwards. Train person to close the eye using facial muscles.

Fig. 9.8 VMT for facial nerve

A gap visible between the upper and lower eyelids (more than 1mm)	Grade 'P'
Able to keep his eye closed against resistance	Grade 'S'
Not able to keep the eye closed against resistance	Grade 'W'

Grade the muscle power as 'S', 'W' or 'P'.

Grading muscle power of eye:

Other muscles of the face may also be affected in the late stages of involvement of the nerve and can be recognized by:

- Flat asymmetrical face
- Loss of naso-labial fold and/or all other creases
- Diversion of angle of mouth towards healthy side on smiling or showing teeth
- Inability to raise eye brow on the affected side and absence of wrinkling of the forehead on the affected side

9.4.6 Consequences of nerve paralysis

Fig. 9.9 Acute conjunctivitis

(i) Conjunctiva:

- **Conjunctivitis:** Continuous exposure of conjunctiva to dust and heat due to incomplete closure of eye, may lead to chronic inflammation of the conjunctiva.

(ii) Cornea:

- **Exposure Keratitis:** Absence of blinking and lagophthalmos predisposes eye to injuries, foreign bodies, insect bite and constant exposure of cornea to heat, dust and wind.
- **Corneal ulcer:** Constant exposure of cornea leads to its dryness, abrasion of corneal epithelial and also predisposes it to injury by foreign body, followed by secondary bacterial invasion and corneal ulceration. Cornea looses hard polished surface resulting in blurring of vision. Cornea may also get damaged by trichiasis, get infected and may heal with scarring.

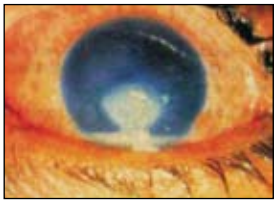


Fig. 9.10 Corneal ulcer

- **Corneal Opacity:** Corneal ulcer may heal by scarring which interferes with vision if central in location, or progresses to perforation leading eventually to blindness.

(iii) Impairment of vision: Vision may be impaired due to consequences of involvement of the nerve(s) like exposure keratitis, corneal ulcer and opacity or due to involvement of the ocular tissue by the disease such as iritis, iridocyclitis and cataract.

Check the Visual Acuity of each eye separately, using an E chart/Snellen chart; if chart is not available, ask the person to count fingers at six metres.

Testing Visual Acuity:

- To test the vision, ask person to stand six metres away and cover one eye.
- Ask the person to read the chart or hold up your hand and ask the person to count the number of fingers shown by you.
- Repeat the procedure with the other eye in the same way.
- If the person cannot read the top line of the chart, or count fingers at six metres, they are visually impaired and have grade -2 disability in that eye.
- This can be due to complication of Leprosy.
- Refer the person to (eye specialist).

Check for following conditions of eye on every visit:

- **Recent impairment/recent deterioration of vision**
- **Infrequent blinking/absence of blinking (insensitive cornea)**
- **Lagophthalmos/increased weakness of eye lid muscles (lid gap >1mm)**
- **Examine for sagging of lower eyelid and Dacryocystitis**
- **Trichiasis and/or entropion**
- **Red/painful eye–iritis/iridocyclitis and complications**
  - **Examine iris: Colour of iris, presence of nodule**
  - **Examine pupil: Shape and reaction to light**
- **Corneal opacity/irregular corneal reflex (corneal ulcer)**
- **Cataract**

9.4.7 Grading of Disability (WHO)

Disability is graded as 0, 1 & 2:

Grade 0: No disability found

Grade 1: Eye is not given grade 1.

Grade 2: Visible damage or disability like red eye, corneal ulcer or uveitis in eye.

9.5 Management of ocular lesions in Leprosy

9.5.1 Basic principles for management of ocular lesions

- **Check** for conditions that may lead to impairment of vision and refer them immediately. especially red painful eye, infrequent blinking, Lagophthalmos
- **Start MDT,** if not taken previously in the presence of ocular lesions due to Leprosy. Most infiltrative lesions in the eye respond well to MDT.
- Look whether **eyelashes** are touching the eyeball, patient may/may not feel the foreign body, epilate the eye lashes as a temporary measure and then refer at the earliest to eye surgeon.
- Give **follow up treatment** as advised by the referral centre to persons referred back.
- **Self care:** Train person in self care after acute phase is over.

9.5.2 Management of Episcleritis/Scleritis:

- Systemic and topical corticosteroids
- Most cases respond well to MDT with topical steroids.
- Clofazimine may be considered in severe/recurrent Scleritis
- Refer to ophthalmologist

9.5.3 Management of Acute Dacyrocystitis

- Oral & local antibiotics
- Refer to Eye surgeon for further management

9.5.4 Management of conjunctivitis

- Frequent washing with clean water (boiled and then cooled)
- Local antibiotics
- Rest to the eye
- Refer if does not improve in 48 hours

9.5.5 Management of corneal lesions

- **Treatment for hypo/anaesthetic cornea:** (Often it occurs in combination with lagophthalmos, sometimes without lagophthalmos)
  - Protect eyes by sunglasses, hat or cap during the day and by eye shield at night
  - Practice 'think - blink' (Refer self care)
  - Self-examination for redness of the eye in mirror.
  - Seek treatment if eye becomes red
- **Treatment for corneal lesions (corneal abrasion/ulcer)**
  - Start systemic and local antibiotic drops/ointment
  - Protect eyes with goggles
  - Refer the person to specialised eye care centre

9.5.6 Management of Iritis/ iridocyclitis:

- **Acute Iritis/iridocyclitis**
  - Can start Tab. Diamox 250 mg four times a day orally to reduce ocular tension if intraocular pressure is found high
  - Repeated episodes of Iridocyclitis (cases with ENL reaction) benefit from high doses of Clofazimine (100 mg TID, reduce gradually)
  - Cover the eye with shield and refer immediately to ophthalmologist
- **Chronic Iritis/iridocyclitis:**
  - Local antibiotics
  - Systemic steroids as prescribed by specialist
  - Check intraocular pressure periodically
  - Continue treatment until no inflammatory cells are visible in aqueous humour or for three months after all the signs and symptoms subside

9.5.7 Prevention & treatment of lagophthalmos

- **Reversal Reaction (RR)/lagophthalmos occurs particularly when skin** patches surround the eye or lie over the course of the facial nerve):
  - Course of Prednisolone, as for type 1 reaction and all precautions as mentioned in chapter on lepra reactions.
  - MDT if not treated for Leprosy in the past
  - Protect eyes using (sun)glasses during the day
  - Cover eyes with eye shield at night
- **Recent Lagophthalmos** of ≤ 6 months duration: same as above. Refer the person to higher centre
- **Established mild lagophthalmos** (> 6 months duration, lid gap of ≤ 6 mm on mild closure; no signs of exposure keratitis): Advise self- care (Refer section 9.6)
  - Protect eyes using (sun) glasses during the day
  - Cover with eye shield at night.
  - Blinking exercises (20 times a day, every time 3–5 times) to strengthen the orbicularis oculi muscle. 'think- blink' habit to moisten the cornea.
  - Artificial tears if felt feasible
- **Established severe lagophthalmos** (> 6 months duration, large lid gap of > 6 mm in mild closure), **or signs of exposure keratitis**:
  - Referral to ophthalmologist/surgeon for eyelid surgery
  - Antibiotic eye ointment in case of exposure keratitis (opacity in lower cornea, together with redness and pain).

"Corneal ulcer is an emergency. Do not use corticosteroids. Refer immediately"

"atropine causes photophobia; use of goggles help reduce photophobia"

9.5.8 Management of cataract

- Person affected with Leprosy can safely undergo "Cataract Surgery" with intraocular lens implantation. Patient should be referred to Secondary eye care centre/District Hospital for the same.
- Regular post operative follow up as advised should be followed strictly.

9.6 Self-Care of eye

Protective mechanism of eye is affected in persons affected with Leprosy who is unable to blink/ close the eyes completely due to damage to the 5th & 7th cranial nerve predisposing it to dryness and injury. Direct involvement of the ocular tissue may also occur due to the disease.

9.6.1 Principles of eye care:

- Protection of eyes from dryness, sun light and dust
- Detection of signs of irritation and injury in early stages
- Detection of signs of involvement of ocular tissue in early stages

9.6.2 Protect eyes from dryness, sun, dust and injury

People protect their eyes from dryness, dust, insects and external injury by blinking during the day and closing their eyes during sleep. Persons with insensitive cornea cannot blink and those with Lagophthalmos cannot close their eyes and are taught to protect their eyes by:

- **Keeping the eyes moist and clean:** Teach person to wash eyes frequently with clean water/instill oil drops (boiled and cooled)/sterile liquid paraffin to keep the eyes moistened
- **Think-Blink:** Person affected with Leprosy who cannot blink automatically must develop a habit to blink voluntarily i.e think-blink for which they are taught to remember to blink and make an effort to close their eyes forcefully. To remember to blink, person is asked to develop a habit to blink every time they pass a tree/house/person/while eating every time they swallow the food or when ever they see another person blinking. Even if person affected with Leprosy is unable to close the eyes completely, teach them to close eye forcefully, because on closing eyes, eyeball rolls up and get wiped by the upper eyelid. People with normal facial muscles are taught to push their cheeks up/use other facial muscles to close their eyes.
- **Eye shield: person is taught to:**

  Protect eyes from dryness, dirt, insects, by using sunglasses with side pieces/hat with broad rim to shield the eyes during the day.

Fig. 9.11 Use of goggles for protection of eyes

If face muscles are weak and gap between the lids is present even on forced closure of eyes, person needs passive exercise to keep the eyes healthy and prevent the deformity from worsening. The person is taught to place their fingers at the outer corner of the eye and gently pull outwards and upwards until the eye closes and count till 10. Person must repeat the procedure throughout the day.

Fig. 9.12 Lid exercise for Lagophthalmos

- Person is also asked not to rub the eye on irritation and practice the same exercise.
- At night, Eye shield is used to keep the eyes closed
  (Ready made plastic eye shields are available in the market)

9.6.3 Early detection of signs of irritation, injury and involvement of ocular tissue

Fig. 9.13 Daily inspection of eyes

- **Tell person to:**
  - Inspect eyes daily to detect any redness of the eye/corneal injury/dust/eyelashes touching the bulbar conjunctiva or cornea/foreign body/any other injury to the eye
- **Teach person**
  - To inspect the eyes, with clean hands (Wash hands with clean water before touching the eyes).
  - Use a mirror/take help of a friend or relative to look for any redness.
  - Remove any spec of dirt with a piece of clean and soft cloth, gently.
  - Epilate the eye lash touching cornea and report to eye specialist immediately.
  - To develop a habit to observe a few selected objects placed at a distance daily, for early detection of any deterioration in the vision.
- **Report to the health centre if notice any of the following**
  - Itching, redness, watering
  - Unexplained pain in the eye
  - Difficulty in keeping eyes open in the sunlight and
  - Any deterioration in vision

Criteria for Referral for eye involvement:

- **Lagophthalmos with large lid gaps (> 6 mm and /or exposure keratitis).**
- **Acute red eyes**
- **Trichiasis, Ectropion, Entropion**
- **Poor Visual Acuity (VA < 6/60) or recent deterioration in vision.**
- **Cataract**

Chapter 10

Disability Prevention & Medical Rehabilitation

Structure

10.1 Introduction

10.2 Definitions of impairment, deformity & disability

- 10.2.1 Impairment
- 10.2.2 Deformity
- 10.2.3 Disability

10.3 Disabilities associated with Leprosy

- 10.3.1 Nerves involved in Leprosy and associated disabilities
- 10.3.2 Consequences of nerve damage
- 10.3.3 Grading of Disability (WHO)

10.4 Prevention of disability & impairment

- 10.4.1 Prevention of disability
- 10.4.2 Assessment of disability and risk status in Leprosy

10.5 Protection/Care of body part with nerve function impairment

- 10.5.1 Aim of self care activities
- 10.5.2 Principles of self care activities

10.6 Care of insensitive limbs

- 10.6.1 Keeping skin soft and supple
- 10.6.2 Protection of limbs from injury
- 10.6.3 Care of the footwear
- 10.6.4 Characteristics of appropriate footwear

10.7 Care of limbs with weakness/paralysis of muscles (Physiotherapy)

- 10.7.1 Management of Contractures
- 10.7.2 Care of paralysed muscles
- 10.7.3 Monitoring self care

10.8 Prevention and management of ulcers

- 10.8.1 Callosities & cracks
- 10.8.2 Ulcers & Blisters

10.9 Disintegration of the anaesthetic foot (without associated ulceration)

10.10 Conditions managed at referral centre

10.10.1 Conditions of the eyes
10.10.2 Conditions of the hand
10.10.3 Conditions of the foot

10.11 Surgical treatment for persons disabled by Leprosy

10.11.1 Conditions requiring surgical interventions
10.11.2 Referral of persons affected by Leprosy for surgery
10.11.3 Criteria for selection for reconstructive surgery
10.11.4 Facts about reconstructive surgery
10.11.5 Priorities for reconstructive surgery

10.12 Support to persons affected by Leprosy with disability

10.13 Community based rehabilitation

10.13.1 Basic Principles of CBR
10.13.2 Potential of the community
10.13.3 Implementation of CBR
10.13.4 Advantages of CBR
10.13.5 Monitoring & Evaluation of CBR

Learning Objectives

At the end of the session, trainees will be able to:

- **Enlist and describe the common disabilities and deformities due to Leprosy**
- **Describe the consequences of impairments**
- **Define criteria for increased risk of disability**
- **Describe care of secondary impairments**
- **Describe and demonstrate self care procedure for prevention of disability in person affected with Leprosy without disability and worsening of the existing disability**
- **List methods for encouraging and monitoring the practices of self care by persons affected with Leprosy**
- **Enlist criteria for re-constructive surgery for persons with disability**
- **Describe community based rehabilitation**

Teaching methods: Lecture discussion, case demonstration, demonstration of aids & appliances, group exercises

10.1 Introduction

Disabilities/deformities in persons affected with Leprosy occur mostly as a result of nerve damage. Damage to the nerve results in impairment of autonomic, sensory and motor functions; leading to loss of sweating, anaesthesia, weakness/paralysis of muscles of eyes and extremities.

Delay in treatment of Leprosy, lepra reaction and neuritis are the main causes of development of disability. If neglected, these disabilities/deformities may worsen gradually and even lead to dehabilitation of the affected person.

- **Most disabilities due to Leprosy are preventable**
- **Disabilities occur as a result of direct/indirect effect of damage to peripheral nerves supplying eyes, hands and feet**
- **Damage to nerves occur due to lepra reactions or insidious process during the course of the disease**

10.2 Definitions of impairment/disability

Terms used in relation to POD

10.2.1 Impairment: Any change in body structure and functions is called impairment.

It is classified as:

- **Primary impairment:** Changes in the structure and functions of the body tissue directly due to disease process like damage to the nerve e.g.
  - Anaesthesia of area supplied by the affected nerve
  - Impairment of motor function.
  - Impairment of autonomic function.
- **Secondary impairment:** changes in the structures and functions of the body part due to neglect, excessive use, careless and improper care of organs with primary impairment.

  For example, in case of:
  - Insensitive hand or foot: Development of **cracks, ulcer, septic hand/ foot, shortening of fingers/toes, even mutilation of hands or feet and disorganisation of foot or wrist**
  - Weak/paralysed part: **Joint stiffness or formation of contractures**

10.2.2 Deformity: Loss or abnormality of structure of body part which is visible i.e. anatomical changes in form, shape or appearance. It can occur due to infiltration of the tissue by the bacteria or damage to the peripheral nerve trunk by invasion of bacteria. Anaesthesia of sole is not a deformity but presence of ulcer/claw foot is a deformity.

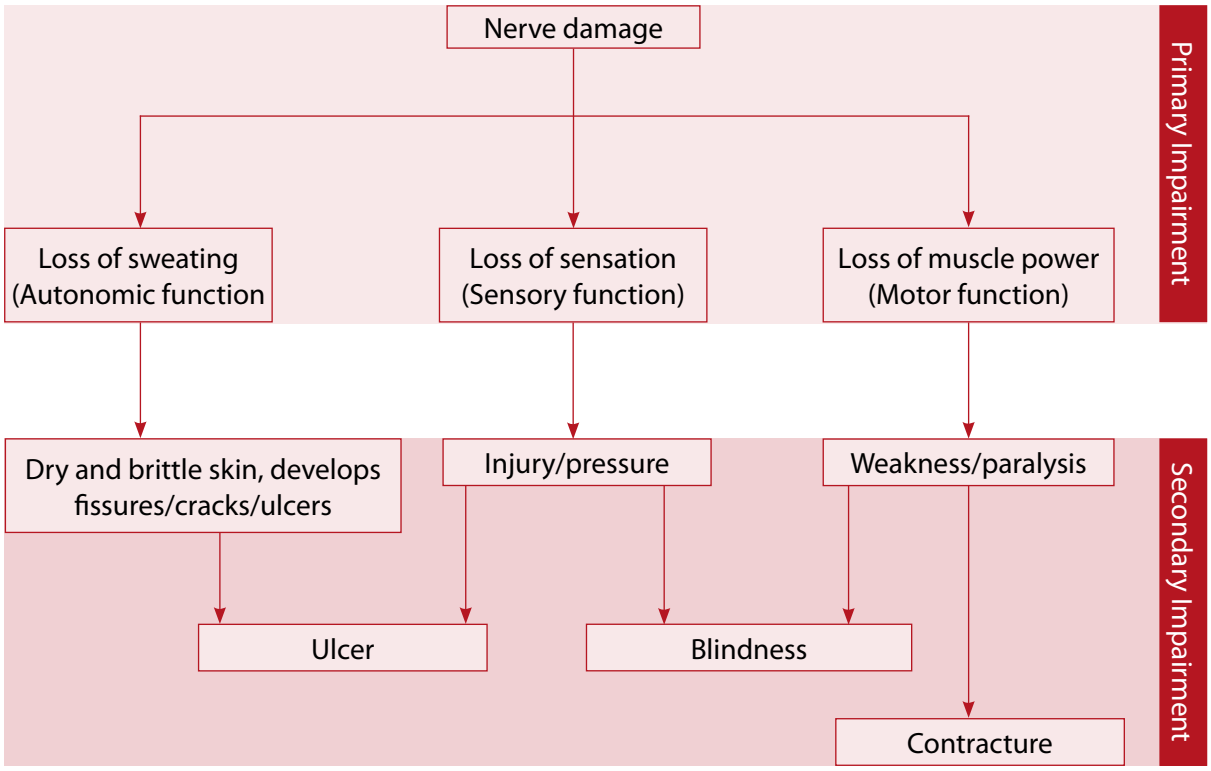
10.2.3 Disability: Inability to perform an activity that is considered normal for a human being of the same age, gender and culture. This includes any impairment, activity limitation or participation restriction that affects a person.

10.3 Disabilities associated with Leprosy

10.3.1 Nerves involved in leprosy and associated disabilities

Site	Nerve	Disabilities
Hand	Ulnar nerve	Clawing of fourth and fifth finger Loss of sensation and sweat over little finger and over ulnar half of ring finger
	Median nerve	Inability to abduct and oppose thumb Loss of sensation and sweating over the thumb, index and middle fingers and radial half of ring finger
	Ulnar and median nerves	Clawing of all five fingers Loss of sensation and sweating over whole palm
	Radial nerve	Wrist drop Loss of sensation over dorsum of hand
Foot	Lateral popliteal nerve	Foot drop Loss of sensation over dorsum of foot and lower leg
	Posterior tibial nerve	Claw toes Loss of sensation and sweating over sole of foot
Face	Facial nerve	Lagophthalmos
	Trigeminal nerve	Loss of sensation over cornea

10.3.2 Consequences of nerve damage



10.3.3 Grading of Disability (WHO)

Disability is graded as 0, 1 & 2:

Grade 0: No disability found

Grade 1: Loss of sensation in hands and feet due to damage of peripheral nerve(s) must not be confused with loss of sensation in the skin patches. Eye is not given grade-1, disability grading for eye is either 0 or 2.

Grade 2: Visible damage or disability like red eye, corneal ulcer or uveitis in eye, lagophthalmos, foot drop, claw hand, wounds or ulcers, loss of tissue due to partial absorption of fingers or toes are grade-2 disability.

For EHF score: Please refer section 6.11 in chapter 6 on diagnosis

Fear of developing **disability** (inability to perform activities like writing) and its consequences are like becoming **dependant** (inability to carry out certain responsibilities like support family economically), **rejected** (leaves house) or denied basic needs like food, water and shelter is often seen in the society.

10.4 Prevention of disability & impairment

10.4.1 Prevention of disability

It means:

- Prevention of occurrence of disability **in people without disability**.
- Prevention of worsening of existing disability in **people with disability** (limitation of disability).

Prevention of disability includes:

- Timely detection of disease and its effective treatment with MDT.
- Identification of high risk people and their frequent monitoring.
- Early detection and treatment of reaction and neuritis (acute & silent) with steroids.
- Early recognition and treatment of impairments.
- Care of insensitive hands, feet and eyes for prevention of secondary impairment (through self care).
- Provision of appropriate footwear, other aids and appliances.
- Enabling sensory and motor recovery by medical and surgical means (Refer 18.13.1-viii).
- Minimising disability by use of splint and other physiotherapy measures and surgery.
- Prevention of dehabilitation and destitution through community based rehabilitation.

10.4.2 Assessment of disability and risk status in Leprosy

(For assessment of disability refer chapter 6 on Diagnosis)

After complete examination of the persons affected by Leprosy, assess the risk status for development of disability and monitor in the following manner:

Those who have already developed some impairment and disabilities are at greater risk of developing new disabilities as well as worsening of existing ones and need urgent specific action. Such persons are identified and monitored more frequently. Risk status for development of disability changes with change in overall condition of persons affected by Leprosy affecting

Table 10.1 Monitoring & Management of cases according at risk status for developing disabilities

Condition	Risk status	Monitor/Management
❖ PB leprosy ❖ Skin soft and supple ❖ No thickening of nerve ❖ No lepra reaction ❖ Normal sensory/motor function	No risk	❖ Need NFA once in three months ❖ Counsel early reporting on development of sign and symptoms of impairment of nerve function
❖ MB leprosy ❖ Positive skin smear ❖ Multipal skin patches ❖ Lepra Reaction ❖ Nerve trunk thickened or tender but no sensory loss ❖ Pregnancy ❖ Skin lesion on or near nerve trunk ❖ On hormonal therapy	At risk of developing NFI (Nerve Function Impairment)	❖ Need NFA once in three months during MDT or every six months after completion of recommended course of MDT ❖ Counsel for early reporting on development of sign and symptoms of impairment of nerve function ❖ Regular treatment of lepra reaction ❖ Refer, if NFI develops after the completion of the recommended course of treatment with MDT.
❖ Only impaired sensation (Grade 1 disability)	Risk of injuries or burns, blisters and ulcers Risk of involvement of more nerves	❖ All of the above ❖ Self care to keep skin of the affected part soft and supple ❖ Protection of insensitive part from injury ❖ Early detection of any secondary impairment and its treatment
❖ Callosities ❖ Cracks ❖ Blisters/ulcers ❖ Scars ❖ Weakness of muscles ❖ Contractures ❖ Loss of vision	Risk of progressive damage and disability	❖ All the above including Self care ❖ Active and passive exercises to maintain range of movement and improve strength of the muscles

Aims of self care activities are:

- **To protect** anaesthetic hands, foot and eyes from any external injury
- **To exercise** the affected part to prevent contractures and preserve vision
- **To report** any impending ulcer and signs of nerve damage and adverse response to treatment without delay

management and monitoring of the person. Hence, risk status of a person must be revised frequently during assessment of disability and the affected person is counselled and monitored accordingly.

10.5 Care of body part with nerve function impairment

10.5.1 Aim of self-care activities

Person with nerve function impairment are trained and encouraged to minimise their disabilities by practicing **self-care**. Health care functionaries at the PHC can support development of self care practices at home or through self care groups.

10.5.2 Principles of self care activities

- To keep the skin soft and supple;
- To Protect anaesthetic hands feet and eyes from any injury that may be acute/chronic; Mechanical/thermal;
- Early detection and management of blisters ulcers/ injuries;
- Prevent development of contractures and preserve vision.

10.6 Care of Insensitive Limbs

Loss of sensation is usually accompanied by loss of sweating; leading to dryness of the skin. Insensitive portion with dry skin predisposes the affected area to recurrent injury, cracks and ulcer. These in turn lead to chronic infection, stiffness and loss of tissue, leading to worsening of disability. Activities of daily living need modifications to prevent worsening of disability.

10.6.1 Keeping skin soft and supple: (Skin care procedures)

Sebaceous secretions retain the moisture with in the skin. To keep the skin soft, people with loss of sweating must practice soaking the limb in plain water, scraping of any dead tissue and oiling preferably twice daily.

Train the person to:

- Soak dry hands and feet in a bucket of water for 20 – 30 minutes (Fig. 10.1) more until any hard and dry skin becomes soft. Container should have enough water to cover hands/feet.
- Rub off the surface layers of keratin by rough cloth/stone with out any sharp edge. In the presence of a crack, thin the edges of the crack by rubbing it along the line of the edge and not across the edge (Fig. 10.2).
- Rub in oil immediately after soaking without wiping. It helps to retain water and keep the skin soft. Use neem oil/liquid paraffin/vaseline. Edible oil may attract rats and insects, which is especially dangerous to insensitive limb.

Fig. 10.1 Soaking-scraping

Caution: Hard and thickened skin should be removed gradually by soaking and scraping over a period of weeks. Trying to remove it in a few days will result in injury to the limb.

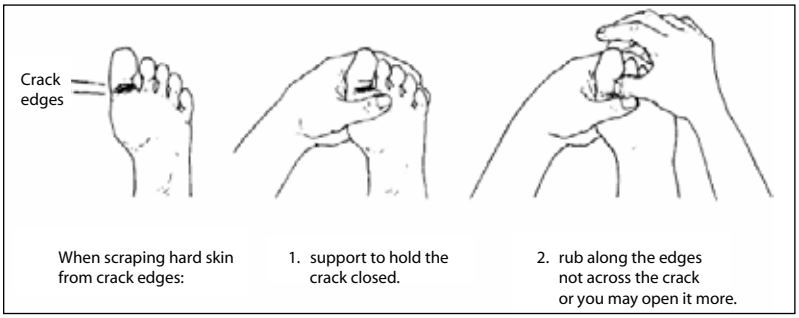


Fig. 10.2 Procedure of scraping cracked skin

10.6.2 Protection of limbs from injury

To protect the insensitive limb, person is made aware about the insensitive part of the body and sensitized regarding possibility of sustaining injury with out knowing about it.

Fig. 10.3 Inspecting foot

Teach them:

- To inspect insensitive hands and feet daily and frequently after work; both at home and at work place, for signs of impending ulcers like redness (hot spot), swelling, blister and dry hard skin, cracks in the skin.
- To feel for "hot spots" (areas of warmth, redness and tenderness) by holding insensitive hand against sensitive area and press gently to find a sore spot.
- To rest the limb if "hot spots" are present.

In case person has sustained injury, train them to think and find:

- Why did the injury occur?
- How can rest be provided to the injured part?
- How can similar injuries be avoided in future?

Fig. 10.4 Handle fire carefully

Method of protecting insensitive hands:

Teach and encourage person to use safe methods of handling hot, hard or sharp implements by using simple protective devices like:

- Keep away the insensitive hand from fire, use stick/tongs to poke the fire (Fig. 10.4).
- Handle hot/sharp objects using gloves/cloth/insulated handles/holders (Fig. 10.5 to 10.9).
- Avoid washing in hot water/check temperature of hot water using sensitive part of the body before using it for insensitive part.
- Avoid doing one type of job for a long duration/change job/give rest/inspect hands frequently for any red hot spots to avoid blisters.

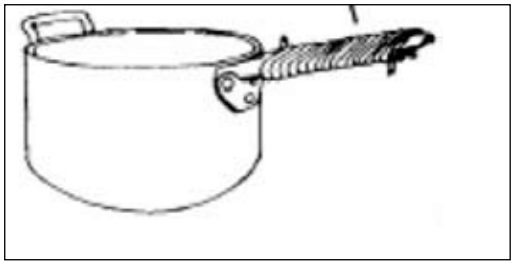


Fig. 10.5 Insulated handle

Fig. 10.6 Use cloth for padding tools

Fig. 10.7 Use cloth to hold hot utensil

Fig. 10.8 Use holder to hold hot tumbler

Fig. 10.9 Use cloth to hold hot glass

Methods of protecting insensitive foot tell the person to:

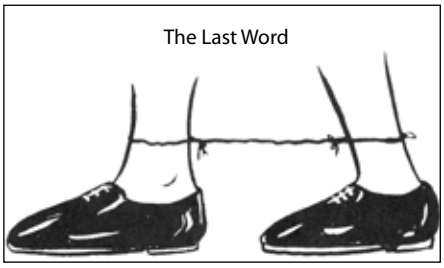


Fig. 10.10 Take small steps while walking

- Avoid standing or squatting for a long time. Avoid walking for long distances/for long duration and on rough/uneven surface. Take frequent rest.
- Walk slowly, avoid running/jumping.
- Take small steps.
- Use bicycle or any other means of transport.
- Use appropriate footwear (soft inside but hard outer sole, never tight but not very loose, no nails) or MCR footwear.
- Look for any hot spot/swollen foot/seek advise

10.6.3 Care of the footwear

Teach person to:

- Check footwear daily for presence of any damage i.e. cracks, torn, embedded sharp objects, gravels/dust that may injure the foot.
- Clean inside of the footwear daily/frequently by piece of a cloth.
- Make sure that nails are not used in footwear.

10.6.4 Characteristics of appropriate footwear

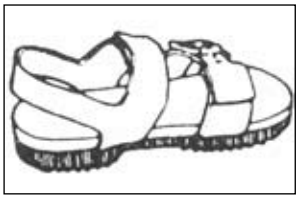


Fig. 10.11 MCR footwear

- Shoe must fit well, neither tight nor loose.
- Usually one size bigger than the required size with broad front so that it has plenty of space for clawed toes or any orthosis if needed (Fig. 10.11).
- It may be designed with adjustable strap to allow adjustment for bandage (Fig. 10.11).
- Back strap to be able to retain footwear.
- Velcro straps instead of buckles to avoid injury.
- Hard outer surface that can not be pierced by thorns (Fig. 10.12) to protect the foot from external injuries.

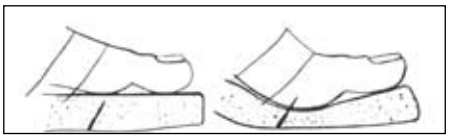


Fig. 10.12 Danger of soft outer sole

- Soft insole of Micro-Cellular Rubber (MCR) of 1cm thickness (known as 15 shore) to provide cushioning to the foot and to avoid pressure on specific points and thus reduce risk of ulceration.
- Metatarsal bar (if needed) fixed obliquely across the outer sole about 2.5 cm proximal to the metatarsal heads (Fig. 10.13).

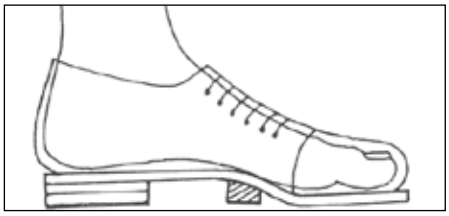


Fig. 10.13 Metatarsal bar

- Arch support (if required) (Fig. 10.14).
- Insole moulded to the contours of the weight-bearing sole for badly deformed foot.
- Support for foot drop if needed.
- Nails or braded thread are not used (may cause injury).

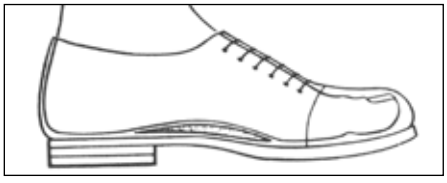


Fig. 10.14 Arch support

Note: Special MCR footwear is not recommended routinely for all the persons affected with Leprosy. A comfortable, locally available, socially acceptable footwear with the above mentioned characteristics is recommended to those who can afford.

However, MCR shoes are also available under NLEP; for those with insensitive sole of foot and cannot afford to buy appropriate footwear. Ask District Leprosy Officer or Medical officer of District nucleus team to make it available.

10.7 Care of limbs with weakness/paralysis of muscles (Physiotherapy)

Involvement of peripheral nerve trunks may result in impairment of motor function of the nerve that leads to either weakness or complete paralysis of the muscles.

Deformities of hands (Claw hand/drop wrist) and feet (drop foot) develop due to paralysis of muscles that can be corrected by surgery. If proper care of deformity is not taken, joints of fingers, thumb and ankle may become stiff.

Stiffness develops for two reasons:

1. **Injury and healing with scarring/fibrosis**
2. **Long-standing untreated deformity**

Skin around the joint is loose to permit movement. Any wound (crack/ ulcer/ injury) near the joint that heals with scarring results in contracture of the skin and may even involve tendon. Such scars restrict the movement of the joint making it stiff. Once fibrosis develops exercise may not help.

Fig. 10.15 contracture

When muscles get paralysed, the limb gets deformed due to imbalance of muscle force around the joints. If the joint is not moved passively for its full range of movement, lax skin on one side of the joint is not stretched and becomes shortened (Formation of contracture) resulting in fixed deformity of the joint that restricts the full movement of the joint (Fig. 10.15).

10.7.1 Management of stiffness

Stiffness is prevented by stretching the unstretched side of the joint daily by moving the joint through full range of movement allowed by the joint. This prevents shortening of the skin around the joint.

Shortened tissue of the stiff joint is stretched daily, gently and firmly by massage and kept in the stretched position for long period with the help of a splint. Thus the range of the movement of the joint is increased gradually over a period of time. Shortened tissue gets lengthened and stiffness improves. Care must be taken to avoid over stretching of the tissue. These exercises are part of self care.

10.7.2 Care of paralysed muscles

Aim of muscles care:

- To prevent contracture from setting in/reduce existing contracture/stiffness of joints.
- To strengthen weak muscles.

Physiotherapy is very important in the management of disabilities and deformities for prevention of worsening and in pre and post operative period. It comprises:

- Exercises
- Oil massage
- Wax bath
- Hydrotherapy
- Splinting
- Electrical stimulation of muscles
- Short wave diathermy
- Ultrasound therapy

Physiotherapy helps in:

- Restoring the normal tone of the muscle and preserving the physiological properties of muscles
- Preventing muscle atrophy and the over stretching of paralysed muscles
- Preventing contractures and keeping joints mobile by improving the range of movement
- Maintaining and improving blood circulation
- Making the skin soft and supple.

Massage

Gentle but firm massage with oil (any locally available oil that does not attract insects and rodents) stimulates muscles, increases local circulation and makes skin soft and supple. It helps in reducing stiffness and prevents contractures. Massage is done for few minutes before exercise or applying splint.

Splints

Most frequent indications for splinting are:

- Flexion contracture of proximal interphalangeal joint of fingers and thumb,
- Web contracture of thumb
- Paralysis of short muscles of thumb
- Open wound at finger flexion creases
- Foot ulcers/foot drop
- Wrist drop

Fig. 10.16 Static splints

Splints are of two types:

- **Static splints:** Static splint does not permit any movement of the joint (active/passive). A well padded splint helps in immobilization of the joint, adjacent to the affected nerve to reduce pain and stimulate healing of the nerve during reaction. It can be used at night to prevent development of contractures or reduce it gradually taking care not to stretch too much to avoid splitting of contracted skin.
- **Dynamic splints:** Dynamic splint has elasticity and works on the principle of recoil. It permits active and passive movement of the joints and needs correct fitting to avoid injury due to friction. They are used for active exercise of the weak muscle to regain strength.

Fig. 10.17 Dynamic splints

Exercise

Both the above mentioned aims can be achieved by doing exercises daily for few minutes while the affected part is still oily.

Note: Avoid exercise or stop exercise if hand has wounds or cracks. Skin must be strong for it to stretch during exercise.

Two types of exercise that can be done are:

- **Active:** The person uses his weak muscles to do the exercise. This prevents contracture and strengthens the weak muscles.
- **Passive:** The person is helped to move the paralyzed part passively to prevent development of contracture.

Exercises for individual nerves that can be taught to persons affected by Leprosy are given below:

Ulnar Nerve Weakness or Paralysis

***Active:* If interphalangeal joints are mobile (Refer Fig. 10.18 to 10.20)**

- Cup the knuckles joints (MP joints) of the affected hand in the cupped palm of the other hand and keep them firmly bent (Fig. 10.18).

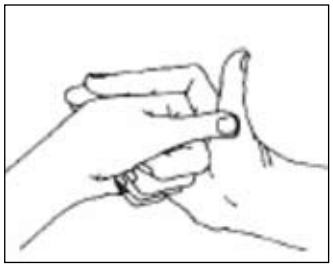


Fig. 10.18

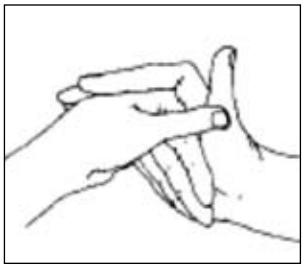


Fig. 10.19

Fig. 10.20

Active exercises for ulnar nerve

- Keep the wrist straight
- Stabilize the joint between the hand and the fingers with palm of other hand.
- Extend/straighten both the interphalangeal joints of the fingers as strongly as one can, keeping the same position till count of ten (Fig. 10.19).

Passive exercises

- Rest the hand on the thigh or on a table padded with cloth (Fig. 10.21).
- Using the other hand; rub the fingers gently to straighten the clawed fingers of the weak hand repeatedly, taking care not to crack weak skin of the fingers. Straighten fingers repeatedly using the other hand (Fig. 10.22 & 10.23).
- Increase range of movement gradually if contracture is present.

Fig. 10.21

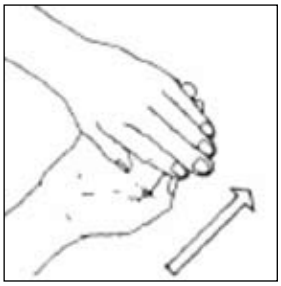


Fig. 10.22

Fig. 10.23

Passive exercises for ulnar nerve

Median Nerve Weakness or Paralysis

Active exercises

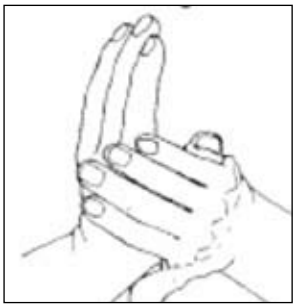


Fig. 10.24

Rest the little finger side of the affected hand on the thigh.

- Use the other hand to support the back of the thumb firmly and hold it straight for a few seconds (Fig. 10.24).
- Straighten the metacarpo-phalangeal joint as strongly as you can (Fig. 10.25).

Fig. 10.25

Passive exercises

Fig. 10.26

- Pull the thumb gently but firmly at meta-carpo-phalangeal joint using the other hand as though trying to lengthen and straighten the paralyzed thumb, but do not bend backwards (Fig. 10.26 & 10.27).
- Holding the thumb at the base with the other hand, pull it away towards the palm and keep in position till count of ten (Fig. 10.28 & 10.29).

Fig. 10.27

Fig. 10.28

Fig. 10.29

OR

Fig. 10.30

- The person must grip around the weak thumb so that the flat part of the thumb lies on the top of the hand (Fig. 10.30).
- The gripping hand is drawn over the joint of the paralysed thumb. This action will force it to straighten. The thumb is held straight till a count of ten before relaxing (Fig. 10.31).

Fig. 10.31

Foot-drop/Common peroneal nerve weakness/paralysis

Active exercises

- Practice bending the foot up and holding it in this position for a few seconds.

Passive exercises

- Sit with the leg straight.
- Pull the foot up using a towel and keep it in this position for some time (Fig. 10.32).
- Repeat this movement several times.

Fig. 10.32

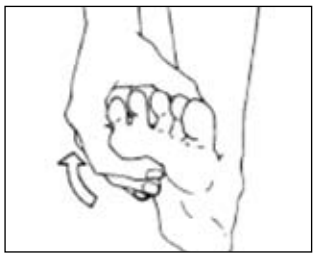


Fig. 10.33

OR

- Hold the outer border of the foot and pull it up to turn the foot out (Fig 10.33 & 10.34). It prevents stiffening of foot in turned-in position.

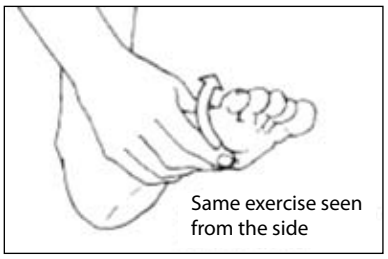


Fig. 10.34

OR

- Stand facing a wall with toes at arms length from the wall.
- Keeping the feet straight, heels touching the ground and knees straight.
- Lean forward against the wall and retain this position for some time. This stretches the calf muscles and prevent its shortening (Fig. 10.35).

Fig. 10.35

Lagophthalmos:

Active exercises

- Close eye forcefully using facial muscles and keep them closed for a count of ten.

Passive exercises

- Keeping finger at the outer canthus of the eye, pull it outwards and upwards and maintain the position till count of ten (Fig. 10.36).

Fig. 10.36

Exercise must be avoided during active Neuritis.

10.7.3 Monitoring self care

PHC staff must monitor the practice of self care by persons affected by Leprosy with disability and support them by:

- Motivating persons affected by Leprosy to practice the preventive measures.
- Verifying that person has understood what to do? How to do it? Knows the reason for doing it.
- Correcting wrong practices adopted by the persons affected by Leprosy.
- Discussing problems and finding feasible solutions.
- Identifying needs for aids and appliances.
- Helping health functionary and persons affected by Leprosy to learn from experience.

During the visit to the village, Health care functionaries must visit the house of Leprosy affected person with disability and look for:

- Condition of the skin, whether soft and supple or not; presence of cracks, callosities and ulcers.
- Range of movement of the affected joints.
- Any stiffness being felt in the movement of the joint.
- During the visit, observe the person performing various activities.
- Watch working tools, footwear and assess whether precautions are being taken to avoid injury to the affected part. In case person is not taking the required precautions; explain the person why the current practice is harmful and how can it be modified according to the person's need.
- Ask persons whether they are facing any problems related to the disease and find a feasible solution with the patient.
- Sometimes, patients solve their problems through innovation which can be utilized for the benefit of the other persons affected by Leprosy in similar situations.

Visit to persons affected by Leprosy shows your concern for them and motivate people to follow the advice.

10.8 Prevention and management of ulcers

To prevent recurrent ulcers and worsening of deformity; detect and manage **cracks, callosities, blisters and ulcers of palm and sole** during the early stages.

10.8.1 Callosities & cracks

Skin of insensitive hands and feet are prone to become thickened and hardened in localized areas (callous) due to abnormal pressure and repeated friction. Callous is actually protective but dry and thickened skin lying opposite a joint breaks open on repeated movement of the joint. If neglected these cracks can develop into ulcer and may even get infected. Hence, all the calluses around the creases of hand and fingers and those under the feet should be removed.

Prevention of occurrence of callous/crack and its management requires:

- Interposing a soft cloth or pad between the hard surface of handle of tools used by the persons affected by Leprosy and insensitive portion of the body to reduce the pressure and friction.
- Keeping hard skin with callosity soft and supple by soaking, scrubbing and oiling (refer self care).
- Covering cracked skin by dry dressing to prevent infection and hasten healing.

10.8.2 Ulcers & Blisters

Reasons of ulcer formation in Leprosy:

Ulcer develops due to neglected cracks and fissures in dry and hard skin (due to loss of sweating) and external injury/burns in the insensitive hands/feet.

While walking, pressure on insensitive feet is normally countered by contraction of intrinsic muscles which elevate the Meta-tarso-phalangeal (MTP) joint region upwards and forwards. When posterior tibial nerve is affected this mechanism is not available due to paralysis of small muscle. More over, there is sagging at MTP joint resulting in increased pressure at localized areas causing local ischemia, traumatic inflammation and breakdown of subcutaneous fat underneath the MTP joint. If sensation in the foot is normal it is recognized as fatigue and the person tends to rest the part providing time to heal; but persons with insensitive skin can not realize the situation and continues to use the foot causing further damage to the tissue. Area of traumatic inflammation undergoes necrosis and liquefaction resulting in formation of blister. If neglected, covering skin of the blister may break down resulting in formation of ulcer.

The location of planter ulcers depends on the mechanical factors. Planter ulcers are most frequently located on the forefoot because forefoot bears most of the force exerted to move the body forwards. Ulcers usually occur at pressure points like beneath the heads of the metatarsal bones.

Ulcers usually heal by secondary union i.e. formation of scar tissue and process of healing begins only when causal factor is removed. If factor causing ulcer persists, ulcer does not heal and becomes chronic non-healing ulcer. Ulcers recur on continuation of the causal factor.

Stages of ulcer formation

Formation of ulcer passes through the following stages:

- **Stage 1 (stage of threatened ulceration):** Stage of ischemia and inflammation, which is recognized as fatigue by normal feet. Rest to the injured tissue at this stage, provides time to the injured tissue to repair itself and become normal.

  People with insensitive feet are not able to realize this warning and therefore, taught to inspect their hands/feet frequently and regularly. One can identify this stage by presence of the following features:

- Presence of deep oedema recognized by increased gap between toes/fingers.
- Deep tenderness at the affected site.
- Local warmth.
- Possibly puffiness over the corresponding site on the dorsum of foot/hand.

Appropriate management of the condition at this stage prevents formation of ulcer. It is managed by:

- Absolute rest to the affected part to allow healing.
- Elevation of the affected part for 48–72 hours to prevent further tissue damage and permit resolution of traumatic inflammation.
- Educating and demonstrating foot care to the person (refer self care).
- Providing protective footwear (MCR footwear).

Fig. 10.37 Blister on the sole of foot

❖ **Stage 2 (stage of concealed ulceration/blister formation):** If rest is not provided and stress continues; inflamed tissue under goes necrosis and liquefaction. Skin over it remains intact and is identified by presence of blister (Fig. 10.37) (necrotic tissue under intact skin).

Teach persons affected by Leprosy to manage Blister (Concealed ulcer) at home.

Manage blister by:

- Gently cleaning the skin over and around the blister with soap and water.
- Mopping it dry taking care not to damage the overlying skin.
- Padding the lesion well and covering it to avoid injury (Fig. 10.38).
- Bandaging it firmly.
- Providing rest to the affected part to allow healing.
- Elevating the affected part.

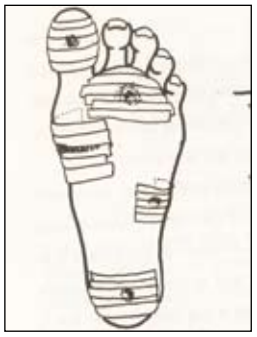


Fig. 10.38 Covering ulcers

If necessary, blister could be snipped away and the area covered with sterile Vaseline gauze dressing. Blisters of foot may need below knee plaster cast with provision for walking made in it after 72 hours. Retain plaster cast for three weeks to allow blister to heal.

- Examine foot for any complicating factors.
- After healing teach foot care to the affected person and provide protective footwear.
- Find the cause of blister and think of a way to avoid the circumstances/activities causing it.

If blister is between the toes or close to a toe, put some padding between all the toes so that toes are kept apart and do not rub against each other. Provide rest to the foot for at least 72 hrs. If unavoidable, ask the person to use crutches with sling for walking. Blistered foot should not be made to bear weight, instruct patient to keep the foot elevated. Re-examine after 72 hrs. If improves, continue the treatment.

❖ **Stage 3 (stage of overt ulcer)**

Blister may break open due to external injury or continuous use of the affected part or increased pressure from inside due to oedema leads to breakdown of tissue and formation of ulcer. Formation of ulcer results in exposure of damaged tissue to external environment.

Available options for resting foot for healing of blister or simple ulcer caused by walking:

- **Resting the foot in a plaster cast**
- **Using a sling for the foot and crutches during walking**
- **Using crutches during walking, keeping the foot off the ground**
- **Walking on the unaffected part of the foot, using a cane or stick (limping)**

Early signs of breakdown are considered an emergency. At this stage ulcer is simple and not infected and is managed by:

- **Rest and elevation of affected part:** Wounds heal if they are rested by using splint (hands) and/or crutches (foot) and cause of ulceration is removed. What ever may be the circumstances, the injured part must not be allowed to perform normal functions whilst the tissue is still being repaired.

  The best option for the person is to lie down with the foot raised above the level of the heart (bed rest). If rest is not possible, other options like using crutches/stick, using a transport or swapping the activities must be explored
- **Maintaining good wound Environment:** A good wound environment means that wound is free of foreign bodies and toxic substances (dead tissue is toxic and dressing material, especially cotton wool is treated like a foreign body) and free of pathogenic micro-organisms. Wound is kept clean, moist and covered with clean/sterile dressing.
- **To clean** the raw area in the foot or hand (deep crack, wound/ulcer) add boric acid crystals and calcium hypochloride (bleaching powder – 2.5 gram i.e. table spoon in one litre water) in water near body temperature. This prevents sudden change in the temperature of the wound and prevents raw area from getting infected and becoming septic. **Mop** the wound gently with soaked gauge swabs to avoid any damage to the granulation tissue. Do not use cotton wool for mopping because strands of fibre may be left in the granulation tissue and act as a foreign body.
- Wound heals better if it is **kept moist** and the temperature of the wound doesn't change quickly. Wounds should be **covered** with dressing soaked in normal saline to keep it moist and changed after 2–3 days to keep the **temperature stable;** but it should neither become dry nor too wet. Discharge from wounds must be drained and dressing changed whenever it becomes wet to avoid infection. Recent foot ulcers give a heavy discharge in the early stages of healing. Hence, change the dressings at least once in a day. As the wound begins to heal, discharge becomes less and dressings can be left in place a little longer (2 to 3 days before changing). While changing dressing, always soak gauze stuck to the wound, using normal saline or clean warm water to avoid damage to granulation tissue.
- **No local application:** No medication is required in the management of cracks and simple ulcers. Many lotions that are commonly used are actually harmful because they delay the healing of wounds. Some medications may be used in certain situations for specific reasons. Betadine (povidone iodine) is a good skin disinfectant but it should only be used on intact skin. Soap can also be used to clean the skin, including blistered skin, if it is not broken.
- **Medications to be avoided:**

  There are a number of products that are widely used but should be avoided for various reasons:

  - Gentian violet, a widely used purple dye, is a powerful anti-septic, but it dries the wound too much, damaging the new tissue that is formed in the healing process.

- Salt is an anti-septic which also causes too much drying and damages new tissue.
- Soap is also an anti-septic, causing drying when used on an open wound.
- Topical antibiotics should never be used in the treatment of ulcers in Leprosy cases
- Treating the ulcer is a great opportunity to reduce fear and stigma through demonstrating ulcer care without any discrimination. Family members are also encouraged to learn and practice dressing of ulcer and provide nursing care to the patient.

Examination of Ulcer:

While treating the ulcer determine whether ulcer is simple or complicated.

Observation:

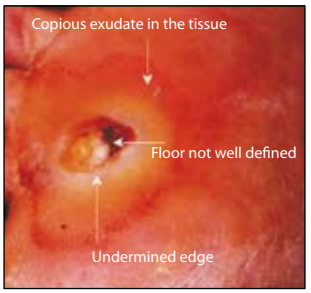


Fig.10. 39 Active ulcer

- **Size of the ulcer:** Person having ulcer with maximum diameter more than 2 cm should be referred.
- **Edges of the ulcer:** Undermined edge means (ulcer is expanding and is in active stage (Fig. 10.39). Sloping edge means ulcer is healing; slight bluish hue of the edges merging with surrounding skin means ulcer is healing well and epithelization is taking place (Fig. 10.40).
- **Discharge:** Determine whether it is copious or scanty. Clear straw coloured discharge is transudate. Creamy, discoloured, thick, sticky but not foul smelling discharge is exudate. Wound with transudate and exudate does not need antibiotics. Thick pale foul smelling discharge is infected and need treatment with antibiotics.
- **Look at the base:** Look for granulation tissue whether healthy or not and its amount. Gel like bright red tissue not bulging above the edge of the ulcer is healthy. Bright red tissue bulging above the edge of the ulcer is called hyper-granulation. It occurs due to some foreign body or sequestrum irritating inside the wound needs referral. Wound with pale necrotic tissue (infected and unhealthy tissue) should also be referred. If bone tendon or muscle is visible at the base of the ulcer (complicated ulcer), refer the person to tertiary care.

Fig. 10.40 Epithelium from edges started covering

Palpation:

- **Palpate the surrounding tissue:** Assess, whether the surrounding tissue it is normal and elastic (normal ulcer treatment)/inflamed and oedematous. Surrounding tissue is still elastic/ firm but fixed to underlying tissue in chronic ulcer (non healing) needs referral.
- Press the surrounding area firmly while looking at the ulcer for any increase in **discharge through any sinus connected** with deeper structure.
- **Palpate the edges of the ulcer:** If hard with callous formation means non healing ulcer and needs referral.

All the wounds and ulcers are categorized as grade 2 disability and must be referred to district hospital after initial treatment (first aid). They are referred back after initial management for follow up management at primary health centre.

A simple ulcer is an ulcer that is:

- Not infected
- Has non infected discharge
- No involvement of underlying structure
- Absence of slough
- Has sloping/healing edge

Rest is the only way to heal a simple ulcer but usually patients cannot afford such rest. They need to work to earn their daily wages. For option of rest refer management of blister.

Healing while walking can occur if the patient is provided with Below Knee Total Contact Cast with or without a Bohler Iron. These casts rest the tissues of the foot by immobilizing them while permitting the patient to ambulate.

Refer, a simple ulcer if it does not heal within six weeks with appropriate management.

A complicated ulcer (Fig. 10.41) is an ulcer with the presence of one or more of the following features:

- Infected discharge (foul smelling).
- Not healing within two weeks.
- Involvement of underlying structures.
- Ulcer fixed to surrounding deeper structure.
- Hyperkeratotic edge, hard fibrosed base.
- Pale unhealthy granulation tissue.
- Presence of slough.
- Malignant change.

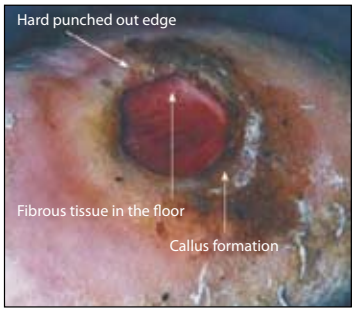


Fig. 10.41 Complicated ulcer

Management of the complicated ulcer consists of treating the complication by:

- Surgical Debridement
- Immobilisation in a splint
- Appropriate footwear

It is the complicated ulcer, which require surgical management.

Principles of Debridement of wound include:

- Removal of all the septic foci.
- Provision of adequate drainage.
- Not to leave behind any:
  - Sharp spiky bony ends and/or,
  - Bony prominences over scarred weight bearing areas.

Presence of these features cause recurrence of ulcers or sinuses.

Recurrent ulcer:

Most plantar ulcers recur on return of the cause for ulcer or may recur despite adequate care, even on walking for small distance. These ulcers need special care to prevent recurrence.

Causes of recurrence are:

- Factors of ulcer formation continue to operate.
- Brittle scar from healing of ulcer is unable to withstand stresses generated during walking.
- Deformity produces excessive stress on scar.
- Flare of lingering infection in deeper structures.

Recurrence is prevented by:

- Preventive care of the foot and reducing stress on foot by limiting walking and using protective footwear.
- Eradication of infection through debdridement if needed.

- Improve the quality of scar by excising scar and closing gap by re-suturing/skin grafting, use of flaps including myo-cutaneous flaps and free flaps.
  - Surgical procedures to modify architecture of foot for equal distribution of body weight.
  - Reduce the load on the scar by modifications in footwear (metatarsal bar, arch support, moulded insole).

Family members are also encouraged to learn and practice dressing of ulcer and provide nursing care to patient.

Prevention of ulcers: it is essential to prevent the occurrence of the first ulcer because after the formation of ulcer in the foot, recurrence is common and difficult to prevent. To prevent the occurrence of ulcer it is essential that person is made aware about loss of sensation, inspect feet frequently, press deeply on the pressure bearing part of the sole to find warm and sore spots, rest on appearance of first sign of injury to avoid ulcer formation, practice SSO (Soaking, Scraping, and Oiling) to keep the skin soft. Use appropriate footwear, take care of the footwear and walk slowly taking small steps and short distances. Never run or jump.

Criteria for Referral:

- Not healing (with in a period of 6–8 weeks),
- Recurrent ulcer,
- Complicated ulcer (deeper structures like bone/ tendons is exposed).

10.9 Disintegration of the anaesthetic foot (without associated ulceration)

It is also known as 'Charcot's foot', 'Hot foot' or simply 'neuropathic disintegrated foot'. Charcot's foot is progressive degeneration of the bones and joints of an insensitive foot due to repeated and sustained trauma. It involves ligaments, cartilages and bones of forefoot and midfoot.

Reasons

It occurs due to:

1. **Torn ligaments (sprain/strain),**
2. **Fracture of cartilages or bone (tarsals or meta-tarsals).**

It can occur in a normal appearing insensitive foot or in an already deformed foot. Where previous acute disintegration was not noticed or diagnosed or was inadequately managed or even after being well managed.

Clinical presentation

Person usually presents with the following features:

- Swollen foot without any ulcer or pain.
- Warm but non tender foot on palpation.

Person with Charcot's foot may keep walking normally with swollen foot and if it remains undiagnosed or untreated it progresses to total disintegration of foot.

Management of hot foot includes:

- Elevation of foot.
- Non-weight bearing plaster cast for one month (till oedema settles and cast becomes loose).
- Re-apply plaster cast (weight bearing) for 5 months.
- Follow up with fixed ankle brace for 1½ years.

Such patients must be referred to tertiary care unit for management.

10.10 Conditions managed at referral centre

Persons with conditions that cannot be managed at a particular health centre due to lack of training or necessary resources are referred to appropriate centre for management and staff at the centre must know where a person should be referred.

Following conditions need referral and can be managed only at centres with specialized facilities:

10.10.1 Conditions of the eyes

- Any acute eye problem must be managed at an eye clinic.
- Corrective surgery may be helpful in severe cases of lagophthalmos.
- Cataract is the commonest cause of blindness in elderly people, whether or not they have Leprosy; Leprosy does not prevent routine cataract surgery.

10.10.2 Conditions of the hand

- Modification of tools to avoid injury to insensitive hands.
- Removal of thick callous and trimming of ulcers.
- Need splint to wear at night for weak muscle or a contracture.
- An invasive infection (the hand is hot, red and swollen) is an emergency and is referred for intensive antibiotic treatment and surgery.
- Surgery is appropriate in some cases of weakness or claw-hand, as long as the joints remain mobile.

10.10.3 Conditions of the foot

- Removal of thick callous by trimming.
- Chronic ulcers requiring orthosis or surgery.
- An infection (the foot is hot, red and swollen) is an emergency and must be referred for intensive antibiotic treatment and surgery.
- "Hot foot".
- Foot-drop requiring surgery.

10.11 Surgical treatment for Persons disabled by Leprosy

Leprosy leads to physical, functional, social and/or economical problems. Physical rehabilitation includes physiotherapy and occupational therapy, orthotics and prosthetics services, assistive and protective devices and sometimes corrective surgery. Persons affected by Leprosy with residual disability and deformity can be referred to specialist for surgical correction of disability. At present such facilities are available at three Central Govt. Institutions, some Physical Medicine and Rehabilitation (PMR) Institutions, PMR departments of selected medical colleges and referral centres managed by NGOs as per the list enclosed in the Annexure-X. Facilities for reconstructive surgery are also being created in selected District Hospitals in a phased manner.

Reconstructive surgery (RCS) aims to restore function and form of the affected part as far as possible and to prevent further disability. It also plays an important role in the prevention of disability and rehabilitation process. All the people with disability due to Leprosy are not suitable for RCS. It is important to know the criteria to select suitable people for surgery.

10.11.1 Conditions requiring surgical interventions

(i) **Irreversible claw hand** due to paralysis of ulnar/median/both the nerves.
(ii) **Foot drop** due to paralysis of lateral popliteal nerve.
(iii) **Claw toes** due to paralysis of posterior tibial nerve.

(iv) **Lagophthalmos/facial palsy** due to paralysis of branch of facial nerve.

(v) **Wrist drop** due to paralysis of radial nerve

(vi) **Triple nerve paralysis:** Paralysis of ulnar-median-radial nerves in the same hand.

(vii) **Recurrent wounds of hands and feet.**

(viii) **Chronic nerve pain and nerve abscesses:** Patients who have chronic pain and swelling in peripheral nerves, which does not respond to analgesics and a course of steroids should be referred for consideration of nerve decompression.

(ix) **Deteriorating nerve function** despite steroid therapy.

(x) **Facial deformities requiring plastic surgery:**

- **Madrosis:** Graft from scalp or temporal artery island flap.
- **Sagging of face/mega lobule:** Rapid disappearance of lepromatous infiltrate after treatment with MDT and destruction of elastic and collagen fibres in the dermis produces wrinkling of skin and appearance like an ageing skin. Pre-auricular or naso-labial face lift can help selected cases.
- **Nasal deformity:** Due to invasion and destruction of nasal tissue especially nasal septum.

(xi) **Gynaecomastia (enlarged breast) in males:** Occurs due to hormonal imbalance produced by destruction of seminiferous tubules of the testes.

10.11.2 Referral for Reconstructive Surgery (RCS)

Health care functionaries can motivate suitable persons (those who needs surgery and would be benefited from reconstructive surgery or other forms of surgery), refer them for RCS at the right time and encourage them to practice pre and post operative physiotherapy.

Member of health team at PHC must be able to identify person for RCS. It is important that centres doing reconstructive surgery in Leprosy, liaise with other staff in developing local criteria and making arrangements for referral of appropriate patient.

A disability register must be maintained by collecting information from case cards, old and current registers. Help of other members of the team may be taken to update the list of disabled persons. Persons who can be benefited by surgery and are willing to undergo surgery are referred to District Nucleus team at district headquarter on the designated day for assessment and facilitation of reconstructive surgery.

Pre and post-operative physiotherapy is essential for a successful outcome of surgery and is arranged in consultation with the surgical centre. Those referred back after the reconstructive surgery need:

- Post operative exercise
- Monitoring of nerve function to check recurrence of reaction and neuritis.
- Prevention of reoccurrence of ulcers by adopting self care procedures.
- Care of orthoses/prostheses.

Instructions given by surgeon/physiotherapist at the time of discharge must be followed.

10.11.3 Criteria of selection for reconstructive surgery

The detailed criteria usually vary between reconstructive surgeons and it is important that surgeons make the members of health team aware of their local policy for referring people. The general criteria have been grouped into three categories: **social and motivation, physical, and the Leprosy treatment criteria.** Patient must be empowered to take the decision of surgery. The patients and the health workers must be involved in the decision of referral for surgery.

Social and motivational criteria

All patients who would be benefited, socially, occupationally or economically, are considered for surgery. The surgery must have the potential to make a difference to patient's acceptance in the society, family and improve the socio-economic situation.

Patients must be well motivated and should have demonstrated that they are responsible for their own health and follow instructions on treatment and care of their eyes, hands, and feet before surgery. Patients who are not well motivated in self-care are not likely to be willing to participate in essential pre and postoperative physiotherapy.

Financial support or compensation for loss of income and travel may need to be considered for patients who have dependent families. The surgery involves loss of economic activity for a period of several months and especially people who are the main breadwinner for the family, may not be able to undergo surgery unless assistance is provided. Contact DHO/DLO for the same.

Physical criteria

The best age for referral for tendon transfer is between 15 – 45 years, but patients younger than 15 years or older than 45 years may be operated on, depending upon the particular circumstance. The muscle paralysis should be present for at least one year and preferably not longer than three years. There may be exceptional cases where there has been muscle paralysis for longer than three years and the individual has kept the joints supple through passive exercises. Sometimes, the patient may not remember accurately how long muscle paralysis has been present, so suppleness of the joints is more useful criterion.

Patients with severe contractures or stiff joints are not suitable for tendon transfer, although physiotherapy or surgery can reverse some contractures.

There must not be any infection of the skin such as scabies and any deep cracks, wounds or ulcers at time of referral.

Leprosy treatment criteria

- Patients should have completed the scheduled course of MDT or at least a minimum of six months MDT.
- Patients should be free from reactions and symptomatic neuritis for at least six months.
- Patients should not have taken steroids during the past six months unless the surgery is for neuritis.
- There must not be any tenderness of any major nerve trunk in the limbs.

10.11.4 Facts about reconstructive surgery (RCS)

In addition to the above, person must be willing for the following before undergoing surgery.

Tendon transfer in Hand (Fig. 10.42 & 10.43):

- Person must have six months old paralysis of one or more nerve: ulnar, median or radial.
- Only mobile deformities without contracture are taken for surgery. Person with stiff hands and feet who are willing to under-go correction of deformity are referred to surgeon to let the surgeon decide for the surgery.
  - Person needs at least one week of pre-operative physiotherapy and should be willing to get admitted a week before surgery.
  - If afebrile, person is discharged after 2–3 days of surgery and asked to return on 21st post operative day for post-operative physiotherapy.

Fig. 10.42 & 10.43 Clow hand before and after Reconstructive Surgery

- At least four weeks of physiotherapy is needed after surgery commencing from 22nd day of surgery.

Tendon Transfer in foot:

- Person must have at least one year old paralysis of common peroneal or posterior tibial nerve.
- Person must be willing to spend four weeks in plaster cast after operation and under go physiotherapy for four weeks post operatively.
- If afebrile, person is discharged after 2–3 days of surgery and asked to return on 28th post operative day for four weeks (for physiotherapy) or may be admitted for entire period of eight weeks.
- Only mobile deformities are taken for surgery.

Tendon transfer for Lagophthalmos.

- Persons with Lagophthalmos are referred for surgery, irrespective of their age; because of the risk of impairment of vision.
- Lagophthalmos can be unilateral/bilateral.
- Minimum duration of paralysis must be 12 months.
- The patient should not be undergoing steroid therapy and should have completed steroid therapy at least three months prior to being taken up for surgery.
- Slit skin smear should be 1+ or less than 1+.
- Persons not fitting the criteria of RCS can be considered for simpler procedures like tarsorraphy.
- Person must be willing to spend three weeks on liquid diet post operatively and then under go physiotherapy.

Guidelines for surgery of the nose:

- May just have a collapsed nose or collapsed tissue defect of the nose.
- Should not have an ulcer in the nasal lining.
- Minimum duration of the collapse should be for 12 months.
- Should have completed 12 pulses of MB-MDT.
- Should not be in Type 1 or Type 2 reactions.
- Should not be undergoing steroid therapy and should have completed steroid therapy at least three months prior to being taken up for surgery.
- Nasal and slit skin smear should be negative.
- The patient should not have any complicated ulcers of the other limbs or in another part of the body.

10.11.5 Priorities for reconstructive surgery

Operations for lagophthalmos are usually considered as a high priority because of the possibility of secondary damage to the eye and impairment of vision. Feet are usually considered the next priority followed by hands, but this may depend on the needs of individual patients. Priority must be given to younger persons.

For most patients there is a period of few years during which surgery is most likely to be beneficial. This starts when the disease is stable (free of reactions and neuritis), MDT course is completed and the muscle paralysis is not likely to progress or recover. Motivation is a key factor as patients may need to be in hospital for at least six weeks and will have to work at physiotherapy. Patients in whom surgery will make a difference are considered for referral.

The proposed surgical procedure and its positive consequences are balanced against the consequences of not doing surgery. Discuss this with the patient and the decision whether to undergo surgery, must be taken by the patient. Methods of managing to live with the deformities, without causing further damages to the affected parts should be explained to patients who do not want or are not suitable for surgery.

General criteria of fitness for surgery:

- **Ideal age group is between 15 and 45 years**
- **Duration of the deformity should be > 6 months**
- **New cases on treatment must have completed at least 6 months of MDT course**
- **Patient should not have had any episodes of lepra-reaction or neuritis and or treated with prednisolone in last six months**
- **Absence of foci of secondary infection**
- **Patient should be willing, astute enough to be re-educated**

10.12 Support to persons affected by Leprosy with disability

For prevention of occurrence of disability/its worsening, disabled people need support of the health functionaries, family members and community. Encourage them to practice self-care at home and ensure that they understand its importance. Facilitate physical and socio-economic rehabilitation.

- **Check awareness of lifestyle** that can predispose the person to develop ulcers and injuries. Help the person to list all such activities (cooking, cutting grass, etc.) Encourage the patient to look critically at all objects, which can hurt him. Discuss ways to overcome the problem.
- Ensure that person understands the concept of self-care by explaining the importance of practicing self care, giving examples of aids that can be used to prevent injury e.g. Tongs, cloth etc.
- Explain and demonstrate procedure of preventing deformities repeatedly till the patient understands.
- Ask the patient to demonstrate to you that he has understood. Give the person a feedback on his performance.
- Ensure the **support of family members** and friends to persuade the patient, who can influence the patient's decision making and can be a powerful aid to convince him to accept

self-care. At least one of their family members must be taught self care to support and monitor practicing self care by the persons affected by Leprosy with disability.

- Visit the person at home to monitor the self care practices during visit to the village.
- **Find the cause:** If, in spite of the best efforts the patient does not follow the advice, try to find the cause and help her/him to solve the problem.
- **Self-care groups** may be started in the community. A number of people practicing self-care need support. To provide them support, facilitate them to form self help group and members of self help group can meet together regularly to discuss the practicalities of self-care. These groups are often supportive and can be very motivating for members.

10.13 Community Based Rehabilitation (CBR)

Disability arises due to deliberate/unconscious denial/limitation of equal access to opportunities for disabled people in their families and community. It may be because of cultural social institutional, environmental and attitudinal barriers.

Rehabilitation includes all the measures used for reducing the impact of disability for an individual, enabling him/her to achieve independence, social integration, a better quality of life and self-actualization.

The Ministry of Health & Family Welfare and Ministry of Social Justice & Empowerment (MOSJ&E), GOI are expanding rehabilitation services to the persons with disabilities. For example Ministry of Health & Family Welfare, GOI is establishing physical medicine and rehabilitation department in medical colleges and regional hospitals. An additional support is being provided to institutions conducting reconstructive surgery for polio disability to start surgery for Leprosy deformities. In addition, there are several NGOs/Institution supported by ILEP partners for carrying out rehabilitation services.

For many years, rehabilitation has been observed as an institution based programme. Institutional rehabilitation addresses the problems of individual disabled person and is often available only for a small number at a high cost. Moreover, the efforts and activities in an institution are often out of context to the felt needs of the disabled person and thus fall short of their expectations. In an institutional rehabilitation programme, the community is not linked with the process. Hence, when the disabled persons return home, it becomes difficult for them to integrate into their community.

Disability often requires life-long management, which should become a part of daily life. Therefore, activities aimed at enabling people with disability should be community based as much as possible. Community Based Rehabilitation (CBR) is a strategy within community development for the rehabilitation, equalization of opportunities, poverty alleviation and social inclusion of all the people with disabilities. It is implemented with combined efforts of people with disability, their families, community, social and government organisation.

The basic physical and social needs of an individual like food, health, education, shelter, social participation etc are same for all the people, including people with disability and people affected by Leprosy. CBR facilitates access to basic needs, and promotes equal opportunities and equal rights for the disabled. It is therefore a multisectoral strategy with some key principles to enable people with disabilities to participate in the whole range of human activities.

10.13.1 Basic principles of CBR

The principles outlined below are overlapping, complementary and inter-dependent.

- **Participation:** It means active involvement of people with disabilities in the various activities of the community as well as development of CBR programme. Disabled people are better aware of their needs, have abilities (not disability) hence, they should be involved in policy-making, implementation and evaluation of the programme.

- **Empowerment:** Local people, specifically people with disabilities and their families are adequately trained so that they are active in decision making, take leadership roles and control resources for their welfare. Service providers, CBR workers, and facilitators are trained to ensure that people with disabilities are included in all the stages of the CBR. This results in people with disability being valued/respected which improves their self-confidence.
- **Raising awareness:** CBR also addresses attitudes and behaviour of the people within the community. Community is told about the disease awareness by making them aware about their abilities as well as problems and support required by people with disabilities. Some of the sustainable benefits of CBR are reduction in stigma, employment opportunities, marriagability, active involvement in family and social welfare. It also promotes the need for and benefit of inclusion of disabled in all developmental initiatives.
- **Self–advocacy:** Advocacy means promoting or speaking for a cause. It involves speaking out for in-justice and working for equality of rights. CBR consistently involves people with disabilities in all issues related to their well-being. People with disability organise themselves to represent their needs, get support from other organisations, local community, community leaders, administrators, policy makers to create space for interactions and demands. They also coordinate with other organisations to utilize available resources for their rehabilitation.
- **Gender sensitivity and special needs:** CBR addresses needs of individuals as well as groups within the community with special needs like women, children, elderly and socio - economically disadvantaged groups.
- **Partnerships:** CBR depends on effective partnership which means all the organisations (community-based organisations, government organisations and other organised groups) working for people with disabilities, agree and work together for the common goal. It includes regular meetings, interactions, planning and monitoring on the progress made/ achieved.
- **Sustainability:** CBR activities and benefits must continue with minimal external support (trained manpower, money and material) after the initial interventions of the programme. It means locally available resources are used, local people are trained; benefits continue and become long lasting and help generation of its own resources for continuation of the programme.

In CBR, people with disabilities are able to work together to organise their own lives and their development, through active involvement and the support of their families and local communities. It helps in reducing poverty by increasing access to livelihood opportunities and empowerment.

10.13.2 Potential of the community

Community is the primary resource available for rehabilitation. It has access to resource, can provide long term support for effective rehabilitation and can understand problems that may arise. Even the poorest community has resources that can facilitate inclusion and participation. Therefore, community workers must have good understanding of the community and it's potential.

10.13.3 Implementation of CBR

Implementation of CBR varies with local situations (geographical, culture, socio-economic-political etc.) and existing organisations (Governmental, Non-governmental, Community-based organisations etc.). Comprehensive rehabilitation would include services for prevention of impairments, promotion of self-care, provision of assisting and protective devices (e.g. wheel chairs and prostheses) physiotherapy and occupational therapy, counselling, formation of self-help

groups, corrective surgery, vocational training including education, literacy, micro-credit schemes and other developmental activities. Community based interventions must be aimed at changing the attitude of the community towards disabled people from exclusion to inclusion; and mind set of disabled people from passive receivers to active contributors in the development of the community. It also includes making necessary changes in the environment and service delivery systems to encourage participation of disabled in the development of the community and aims at improving quality of life for them.

It includes the following activities:

- Generation of awareness in the community for prevention of disability.
- Provision of health care facilities for early detection and management of disabilities.
- Creating a positive attitude towards people with disabilities.
- Advocacy for inclusion and equal opportunities for disabled.
- Networking between community and other organisations.
- Provision of functional rehabilitation services.
- Supplying information to clients or communities about resources and opportunities available in and around them.
- Provide counselling to address psychological or social problems.
- Provision of educational and training opportunities for empowerment of the disabled persons.
- Facilitate in initiating small projects that provide income without the risk of aggravating disabilities.
- Creation of micro and macro income–generation opportunities.
- Refer client to other organisations providing specific services.
- Negotiate access to local government services, schools, pensions or benefits.
- Promote participation of people with disabilities in community development activities.
- Management/monitoring and evaluation of CBR projects.

Members of health team at PHC can identify Leprosy affected/disabled persons either by referring from treatment register, disability register and/or through survey. For survey, help may be sought from other functionaries working for the development of the community like Teachers, ASHAs AWWs etc. Assess the disability and needs for rehabilitation by discussing the issue with health workers and disabled people about their experiences, interests, expectations, frustrations and ideas to improve the situation. Provide basic services like drugs, dressing materials, protective footwear, counselling and training in self care. Assist in procuring protective devices. Encourage them to practice self care, discuss their problems, find feasible solutions and refer them to other organisations providing services. Encourage them to become member of an existing self help group or organise themselves in to a self help group.

Health worker can act as supervisor and trainer for health related aspects. Health functionaries can establish liaison with Village Health & Sanitation Committee to discuss the issues of disabled people, with referral centres to provide specialised care to those who are in need like physical rehabilitation services, ulcer care, physiotherapy, surgical treatment, treatment of eye complications, prostheses etc. and follow up services. Recognize professionals such as surgeon, physiotherapist, vocational trainers, counsellors, support staff, orthotists/prosthetists and technicians at district hospital or specialised centres to provide referrals services.

Medical officer can advocate on behalf of the people with disability and sensitize local leaders, community, members of health and sanitation committee regarding their needs. Medical officer along with the help of other community leader can communicate with district authorities regarding

various facilities available for the benefit of the disabled, coordinate with various agencies/ organisation, and help in dissemination of information to potential beneficiaries/users.

Facilitate accessibility to 'socio-economic rehabilitation services' through social welfare department. District Nucleus Teams can steer the rehabilitation activities and facilitate the accessibility to different services.

Officials from other departments/ministries like educational department, Ministry of Social Justice and Empowerment (MOSJ&E), corporate sector, ministry of labour can address the agreed needs or problems related to individuals or communities such as aids & appliances, grants and aid, occupational training and employment etc.

10.13.4 Advantages of CBR

- **Organising SHGs** provides visibility to the group members, support for individual group members; solve group problems, enhance mainstreaming of Leprosy disability services with general disability services and involvement of general disability issues into development projects. It provides identity to the individuals among the group members and to the group within the community so that the members of the group act as a resource to the community.
- **Empowerment of Disabled:** People with disabilities and their families are provided updated information and training so that they are able to take responsibility for their development within the context of general community development.
- **Change in Behaviour:** The expected outcome of CBR in NLEP is to change the mindset of the disabled people so that people affected by Leprosy do not remain a passive recipient but become active contributors and participate in family and community life like learning, playing, working, household activities, politics and cultural activities.
- **Empowerment of community:** Community must assume responsibility for ensuring that all its members, including those with disabilities, achieve equal access to all of the resources that are available to that community and that they are enabled to participate fully in the social, economic and political life of the community.

It also helps in:

- Reducing stigma & discrimination: Organising advocacy meetings, Participatory Rural Appraisal (PRA) and demonstration of non discriminatory behaviour during village health day, with 'Rogi Kalyan Samiti' etc reduces perceived fear of infection and misconceptions related to leprosy.
- Socio-economic rehabilitation: It increases accessibility to socio-economic rehabilitation services for people affected by Leprosy by developing links with social welfare departments. Meeting with MoSJ&E at national level and with social welfare department at district level will facilitate provision of the services.
- Legislative measures: Advocate repealing of some of the "Discriminatory Acts" that are not relevant now and can be changed to facilitate the process of rehabilitation and help in regaining self-esteem by persons affected by Leprosy.

10.13.5 Monitoring & evaluation of CBR

Monitoring helps in assessing the impact of the CBR activities, identify problems faced by the disabled, unaddressed needs, problems hindering the progress of the programme and assess impact of the programme. Monitoring is done by analyzing the reports, field visits, discussion during monthly/quarterly meeting with the stake holders.

Monitor and evaluate disability prevention activities as per Gannt chart/log frame of DPMR programme. Some of the indicators used are early case detection, cure rates by cohort, number of

new disabilities developed during treatment, changes in EHF score, proportion of cases treated for neuritis/operated etc.

There are other indicators that are qualitative (words) and/or quantitative (numbers) which can indicate the success of the programme at different stages like number of people with disability participating in CBR programme, participating in planning other required interventions for people with disability, number of people utilizing various services, participating in community activities, number of people employed/economically benefited or by statements like "I drink tea/coffee with my neighbour," "We walk to the market together," "Our children play together."

Refer Annexure-X for rehabilitation services for people with disabilities.

For further information on CBR, please refer to WHO/ILEP technical guide to CBR.

Chapter 11

Information Education and Communication (IEC) & Counselling

11.1 Introduction

11.2 Job responsibilities related to IEC of leprosy

- 11.2.1 Medical Officer
- 11.2.2 Health Supervisor/Health Assistant
- 11.2.3 Health Worker/Multi Purpose Worker
- 11.2.4 Pharmacist at Block PHC/CHC
- 11.2.5 Accredited Social Health Activist/*Anganwadi* worker/other volunteers

11.3 Messages to generate awareness

- 11.3.1 Features of a good message
- 11.3.2 Key messages to generate awareness
- 11.3.3 Massages to reduce stigma & discrimination

11.4 Planning IEC activities

11.5 Leprosy Awareness Activities

11.6 Counselling

- 11.6.1 Counselling at the start of MDT
- 11.6.2 Counselling on Completion of Treatment (RFT)
- 11.6.3 Counselling of family members of the people affected by leprosy

Learning Objectives

At the end of the session trainees will be able to:

- ☞ **Prepare Annual Plan for IEC and outline its implementation.**
- ☞ **Establish linkages with NRHM IEC plan**
- ☞ **Enlist key messages and describe methods to disseminate**
- ☞ **Describe counselling techniques**

Teaching method/Activity: Lecture, Discussion, Role-play and Group work

Teaching Aids: Case studies, Experience sharing by persons affected by leprosy and Audio-Visual aids

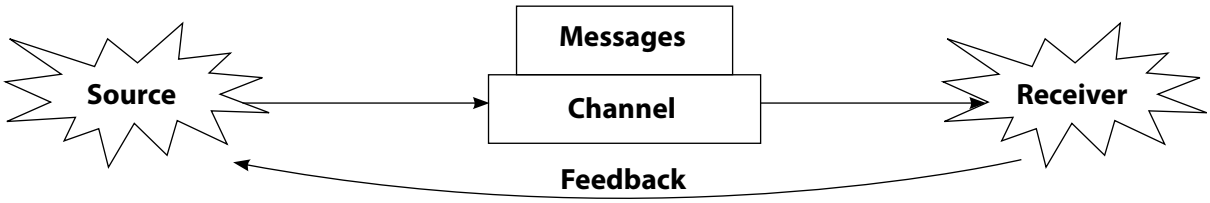
11.1 Introduction

IEC is a strategy for delivery of correct information by the source (Health department/health functionaries) to the recipient (Community including patients) using various channels (print media, electronic media, public address system and visual aids such as pamphlets). It has three inter-related components – Information, Education, and Communication.

- **Information** is knowledge based on scientific facts and figures
- **Education** is a process of bringing out ability of a person/community through learning.
- **Communication** is a process of transmission of information, ideas, attitudes, or emotion from one person (or group) to another (or others) primarily through symbolic messages
- Purpose of communication is to transmit right information and develop mutual understanding

Ultimate aim of IEC is to bring about desired change in the behaviour of the person.

Communication process involves:



Aim: Change in behaviour include,

- Cognitive – Knowledge;
- Affective– Behaviour & Attitude;
- Psychomotor – Skills.

Fig. 11.1 Communication cycle

Health functionaries must know and understand the NRHM initiatives related to IEC; interact with NRHM officials, members of *Panchayati* Raj Institutions, other community-based institutions and utilise the various opportunities available under NRHM for effective dissemination of leprosy related messages.

11.2 Job Responsibilities related to IEC of leprosy

11.2.1 Medical Officer

- Plan IEC activities for generating awareness, reducing stigma and encouraging self reporting and help team members, for their implementation and monitoring.
- Train members of health team and other volunteers in IEC, identification of persons with suspected symptoms and signs of leprosy.
- Counsel, train and encourage persons affected by leprosy, in self care practices for prevention of disability.
- Help members of health team in managing retrieval of absentees/defaulter of MDT treatment and disability care.

To accomplish these responsibilities, delegate various tasks to the other members of the health care team in the following manner:

11.2.2 Health Supervisor/Health Assistant

- Impart health education to the community on leprosy and its treatment.
- Carry out retrieval of absentees/defaulter.
- Counsel cases refusing to accept diagnosis and treatment.

11.2.3 Health Worker/Multi-purpose Worker

- Impart Health Education on facts about leprosy, related discrimination and availability of treatment to the community on routine field visits.
- Ensure completion of treatment and absentee/defaulter retrieval.
- Promote self-care practices by the Persons affected with leprosy having disability.
- Involve ASHA/AWW/PRI's and village health and sanitation committee for IEC activities.
- Generate awareness through specific programme such as school health programme, village health and nutrition day/health *melas* by including leprosy related IEC.

11.2.4 Pharmacist at Block PHC/CHC

- Provide information regarding MDT and associated red coloured urine and darkening of skin.

11.2.5 Accredited Social Health Activist/*Anganwadi* worker/other volunteers

- Generate awareness about leprosy and availability of treatment facilities to encourage self reporting.
- Identify suspected leprosy cases and refer them to Health centre for confirmation and management.
- Help adherence to MDT regimen.
- Identify persons with disability due to leprosy for self care practices.

11.3 Messages to generate awareness

To generate awareness in the community, message related to disease and its characteristics should be developed. Messages must be based on correct scientific information and contextualised in terms of local language, cultural and social/individual understanding.

11.3.1 Features of a good message: A good messages has the following four components.

- **Content:** Should be Clear, short, specific and need based
- **Appeal:** Must lead to/ ask for an action

- **Relationships:** Express relationship among health care system and community (including persons affected by leprosy)
- **Emotions:** Convey pleasing emotions, concern, care and motivation

11.3.2 Key messages to generate awareness

Following four key messages are suggested to generate awareness regarding leprosy in the community.

- **Leprosy is Curable:** The disease is caused by leprosy germs and can be cured with medicines (MDT) that are available free of charge in all the health facilities.
- **Early symptoms of leprosy:** Leprosy usually starts as a skin patch with loss of sensation or as numbness and tingling in hands and/ feet. Consult health worker on occurrence of any of these.
- **Disabilities can be prevented:** Early detection with appropriate treatment helps prevention of disability due to leprosy.
- **No place for segregation:** Leprosy is treatable and once on treatment patient does not infect others and hence there is no place for segregation of Persons affected by leprosy.
- **Accept persons affected by leprosy:** Persons affected by leprosy, once on treatment needs compassion and empathy. Discrimination of patients is inhuman.

11.3.3 Massages to reduce stigma & discrimination

Generic massages about leprosy that can be delivered to reduce stigma & discrimination. Refer Annexure-VII for stigma & discrimination in leprosy.

- Deformities and disabilities are unfortunate remnant conditions of leprosy, which can be avoided if reported early
- Treated persons even with disability are not infectious to others. Residual deformity after treatment does not mean that the patient is still having leprosy and can infect others
- People do not contract leprosy by dressing ulcers and attending to leprosy patients
- Disability due to leprosy is preventable through early diagnosis and appropriate treatment of the disease
- Continued self care by patients themselves improves their social life
- Some deformities can be corrected by operations to restore appearance and function

Treated person affected by leprosy can lead a normal life and become economically independent.

11.4 Planning IEC activities

The IEC plan needs to be formulated in line with the District IEC plan and NRHM initiatives. The plan has to be simple and achievable with limited efforts.

For planning IEC activities, identify the various problems that can be addressed through IEC. To identify these problems information is collected to analyse current situation during delivery of

services, through **dialogue with community** and **other stake holders like** health care providers, active social groups, community leaders, opinion makers/influencers) **during formal/ informal meetings** or through evaluation reports.

The collected data should describe status of awareness, prevailing perceptions about the disease, and also dimensions of stigma in the target group like.

- Knowledge about leprosy, its curability and availability of treatment.
- Usual Health/treatment seeking Behaviour.
- Utilization of available services.
- Reasons for non utilization of services.
- Expectations of community members.
- Reluctance to disclose the problem.
- Exclusion or rejection from school, work, social groups and activities.
- Blame and devaluation.
- Diminished self-esteem.
- Stigmatisation of family.
- Influence on marriage customs and procedures in the community.

Collected information is analysed for different target groups in relation to their influence in the community and programme expectations to prioritize the problem.

To make an effective IEC plan answers to the following questions must be sought.

- Why do we want to communicate?
- Who are the target audience?
- What are their interest, educational status, social needs, cultural back ground, and limitations?

Based on the above information identify:

- Focus areas for the particular target group.
- Identify the resources available.
- Identify the most appropriate time for communication like festivals, fair, village *melas* and avoid the time when people are involved with other activities e.g. villagers with agriculture as the prime occupation; time of roping, manuring, harvesting the crops are avoided for such activities because every body in the family is busy during that period and people are not receptive.
- Identify most appropriate intervention, channel for communication from the available options. Decide the messages to be conveyed, for the target group. While designing the messages keep age, literacy, socio–economical, cultural aspects of target group and spill over effect of that particular intervention (e.g generating awareness in children will also affect the awareness among parents and kins).

The following target groups presented in a table below are critical for a successful IEC strategy and need individual group specific education methodology.

Decide on verifiable objectives and method of monitoring. Identify the person responsible for implementation of IEC activities. Impart training to the concerned person if needed.

Table 11.1 Effective mode of communication for various target groups

Target groups	IPC	Group discussion	Mass
Health providers	xxx	xxx	
Influencers*	xxx	xxx	xxx
Clients	xxx	xxx	
Family Members		xxx	
Community		xxx	xxx
Other target groups **		xxx	xxx

* Influencers are people who can influence a decision of a person/family/group/community. The influencers as change agents also facilitate a changing process and initiate a positive community response.

** Other groups include schools, service clubs, and youth and women groups.

Action plan is made by enlisting the identified activities for implementation with time schedule and person responsible for their implementation as given below.

Table 11.2 Action plan for IEC activities

Target group	Activity	Time of Implementation	Person responsible	Monitoring indicators
School children	School Health talk	Once in six months	MPW (M)	Number of Schools visited in a year
	School quiz	One week prior to Anti leprosy day		Percentage of children with 60% or more correct answers
	Poster making competition	Anti leprosy day		Number of children participated
Women groups	Radio (Community/ AIR/FM) & TV broad/telecasting programme on leprosy and success stories of PAL	Once in six months on leprosy for 15 minutes.	Health supervisor (F)	Women aware of health awareness programme in Radio/TV
	Focus group discussion	Once in six months	MPW (F)	Percentage of people aware of at least one sign and symptom of leprosy
Persons affected by Leprosy at home/ family members	Inter Personal Communication	1 to 2 Persons affected by leprosy on village visit	MPW (F/M)	Percentage of persons affected by leprosy completed treatment in time. Percentage of persons affected by leprosy with grade 1 disability using protective devices. Percentage of PAL with disability regularly practicing self care.

11.5 Leprosy Awareness Activities

The leprosy awareness activities/campaigns are carried out to improve self reporting of cases and contribute to diminishing stigma against leprosy in the community.

Various activities for generating awareness in leprosy:

- **Use of mass media:** Community radio, television local newspaper, local channels may be used to sensitize the community in general.
- **Interpersonal communication** for persons affected by leprosy and their family members.
- **General Awareness activities can be** carried out for selected target groups like schools, youth clubs and colleges. Quizzes/painting competitions/debates may be organised to generate awareness.
- **Leprosy stalls/exhibitions:** These are set up along with other NRHM health exhibitions and *Melas*.
- **Observation of Anti Leprosy Day:** Rallies and exhibitions can be organised to generate awareness. Elected representatives and district administration are involved to felicitate and motivate best workers in health staff, ASHAs, members supporting the programme and patients working as 'change agents'/ 'catalyst' in improving perceptions about leprosy in the community. This can also be used to encourage children with prizes in the competitions during the event.
- **Focus Group discussions:** Focused group discussions are conducted to discuss, share experiences of successful stories and events in different social groups like groups of women (*Mahila Mandals*), school children and youth.
- **Self Help Groups (SHG):** Patient peer groups are organised for mobilising support and improve self care. These groups organise themselves to advocate. Health functionaries and members of other organisations can also support and advocate in different forums on their behalf to fight stigma against the disease and their rehabilitation.
- **Block Leprosy Awareness Campaign (BLAC)** are organised to generate awareness to enhance self reporting in areas with increased load of leprosy cases. Refer Annexure-IX.
- **Modern communication** tools like mobile, e-mail, toll-free number etc. can be used for spreading message.

11.6 Counselling

Counselling is a means to put oneself in the position of the client, guide/help the client to understand their own feelings, problems and situation bothering them and identify possible solutions for the problems and help client to decide on his/her own choice. This process takes time and perhaps more than one session. (For process of counselling Refer Annexure–VIII)

> The counselling depends on the dialogue process and talking points. The discussion is specific to each individual. Considering the principles of counselling, simple and understandable language must be used instead of scientific words.

Due to recognised stigma for leprosy, the patient needs counselling on at least three important points in time i.e. at the start of MDT, while making the patient RFT and at the time of the need.

11.6.1 Counselling at the start of MDT

- It is a disease like any other communicable disease, caused by leprosy germs.
- MDT kills the leprosy germs if medicine is taken regularly every day for six months (PB) and 12 months (MB).

- Person affected with leprosy can lead a normal life during and after treatment.
- Facilities for treatment of leprosy are available free of charge at the nearest health centre.
- Person is considered cured after the scheduled doses are completed. However, anaesthesia and hypo-pigmented skin patches may persist even after treatment.
- Please collect medicine on every 28th day.
- If you cannot come to collect medicine for any reason, please collect MDT for that month in advance. Always collect MDT, 3–4 days before the last dose of BCP is taken.
- MDT is safe to be taken during pregnancy and should be continued.
- May get red coloured urine initially or 1–2 days with use of every new MDT pack. This is due to medicine taken on 1st day of each month. For this one need not worry, as the same will pass off quickly.
- For MB patient– Don't worry about the change in skin colour which is due to the medicine. Normal colour of the skin will return after about a month of stopping MDT.
- Report immediately on development of skin rash that itches or jaundice or any other kind of problem.
- Report to the Health Centre immediately in case skin patches suddenly become red and swollen, nerves become painful and tender, feel pain and numbness in the limbs, weakness, and tingling sensation in the hands, feet or face; increase in area of sensory loss; increase in weakness of limbs, pain and redness in eye/s and any deterioration of the vision during or even after completion of treatment.
- New disabilities can occur any time during or after the treatment and must be reported immediately. New disability of recent origin can be treated but existing disability may or may not improve with treatment.
- Must practice self-care regularly to prevent disability and worsening of the existing disability.
- Close contacts and friends must examine themselves and report voluntarily for examination on next visit. All the children must also be examined and brought for confirmation of diagnosis and treatment in case of any similar lesions.

11.6.2 Counselling on Completion of Treatment (RFT)

- Congratulate persons affected by leprosy for completing the recommended treatment and tell them that they are now fully cured of the disease and need no further MDT.
- The skin patches that are still remaining on the body will take time to disappear. Some patches may remain forever, but these are harmless.
- Recurrence of the disease is rare but if any change in any of these patches showing reactivation of the disease or appearance of new patches is noticed, please come to the Health Centre immediately.
- Loss of sensation, muscle weakness due to nerve damage will also remain and persons affected by leprosy must take all the precautions to save these from injury.
- Come to health centre immediately for treatment if any of the previous symptoms come back again or signs of new nerve involvement, worsening of nerve impairment, reaction, eye involvement appear.
- Continue to follow self-care practices as before to prevent further deformity of insensitive/ weak/paralysed hand/foot.
- Existing residual deformity of hands and feet can be corrected with surgery and can be arranged in (specify) hospital, free of cost. If willing for the same, please let us know.
- On coming across anybody in the village having similar problem; please send him to the PHC immediately.

11.6.3 Counselling of family members of the persons affected by leprosy

Leprosy affected person needs support of the family members and community. Hence, it is essential to counsel the family members of the persons affected by leprosy in order to encourage the affected person to take the treatment regularly, complete it and practice self care for prevention of disability and deformity.

- The disease is caused by germs.
- The disease is not contagious.
- Leprosy is curable with MDT.
- The patient once on treatment will not spread disease to others.
- The person affected by leprosy can lead a normal life during and after their treatment.
- Support the patient to take medicines daily for the scheduled period of treatment.
- Support the patient, reach health facility in case of problems.
- Ensure that the patient follows the principle of self care.
- If any other member of the family has similar problem, please bring him/her to the PHC for examination by the Medical Officer.

Note: Identify suitable staff in each health facility for counselling. The points given above are about issues on which counselling should be centred. However, presentation of these may vary from person to person in different situation.

Chapter 12 Planning

Structure

12.1 Introduction

- 12.1.1 Need for planning
- 12.1.2 What is planning?
- 12.1.3 Desired approach for planning

12.2 Steps in Planning: 'Planning Cycle'

- 12.2.1 Situation analysis
- 12.2.2 Formulation of 'Objective' or desired result
- 12.2.3 Plan of action and work plan for implementation
- 12.2.4 Activity Planning

12.3 Planning document

Learning Objective

At the end of the session trainees will be able to:

☞ **Describe the process of preparation of an Annual action plan for the area covered by the Primary Health Centre**

Teaching method: Lecture discussion, group exercises

12.1 Introduction

Under NRHM, a medical officer of the PHC, besides clinical work, has to act as a manager for different health programme. This chapter deals with planning of the activities in the area of operation of a PHC.

12.1.1 Need for Planning

Planning provides direction to the team to move/work. Planning is crucial for allocation of resources like human resource, time, money etc. for requisite activities to achieve desired results/objectives. By careful planning one can foresee the problems, one is likely to encounter during implementation of activities and overcome them in advance rather than to deal with these in crisis. Planning is also important for monitoring the planned activities that helps in taking timely corrective action, if the activities are not proceeding according to the plan. It also provides an opportunity to evaluate activities in relation to the objectives that could be used for future planning.

12.1.2 What is planning?

It's a step-by-step account of the activities, which are to be undertaken, to achieve desired results/objectives. Planning is to predict the future (where do we want to go?). It's like a road map to reach the destination.

12.1.3 Desired approach for planning

There is a need to change our mindset from activity based planning to objective based/result oriented planning.

Examples: Normally we plan as to how many doctors or pharmacist or ANMs are to be trained (activity based) while our approach should be what for this training is being organised. We want to improve their knowledge and skills which in turn will add to improvement in their performance.

Similarly, we plan a number of supervisory visits to PHCs instead we should think why we are paying these visits and what change these visits should bring, to improve quality of services. There will be more activities required to improve quality of services. Hence in any planning, we should be clear as to what we want to achieve or where do we want to go (Objective based/result oriented planning).

12.2 Steps in planning: 'Planning Cycle'

Planning of health projects is a cyclical process, it start by analyzing the situation. On the basis of situation analysis, we set our goals/objectives and to achieve these goals and objectives plan our activities. During implementation of these activities, we should monitor and supervise the activities to know whether we are proceeding in the right direction or take a corrective action and then at the end of the project or end of the planning cycle, we evaluate to know whether we could achieve the desired effect/change. Refer planning cycle (Fig. 12.1).

12.2.1 Situation analysis

Analysis of existing situation of a block can be conducted by:

- **Collecting information** on the existing geographical, socio–economic and cultural background with prevailing health problems and analyzing relevant indicators.
- **Reviewing evaluation reports,** which contain observations and recommendations by the evaluators.
- **Block level and stake holders consultation:** NRHM places emphasis on community participation. The information should be brought from the village to the Gram *Panchayat* and subsequently presented at the block level for consultations. It should

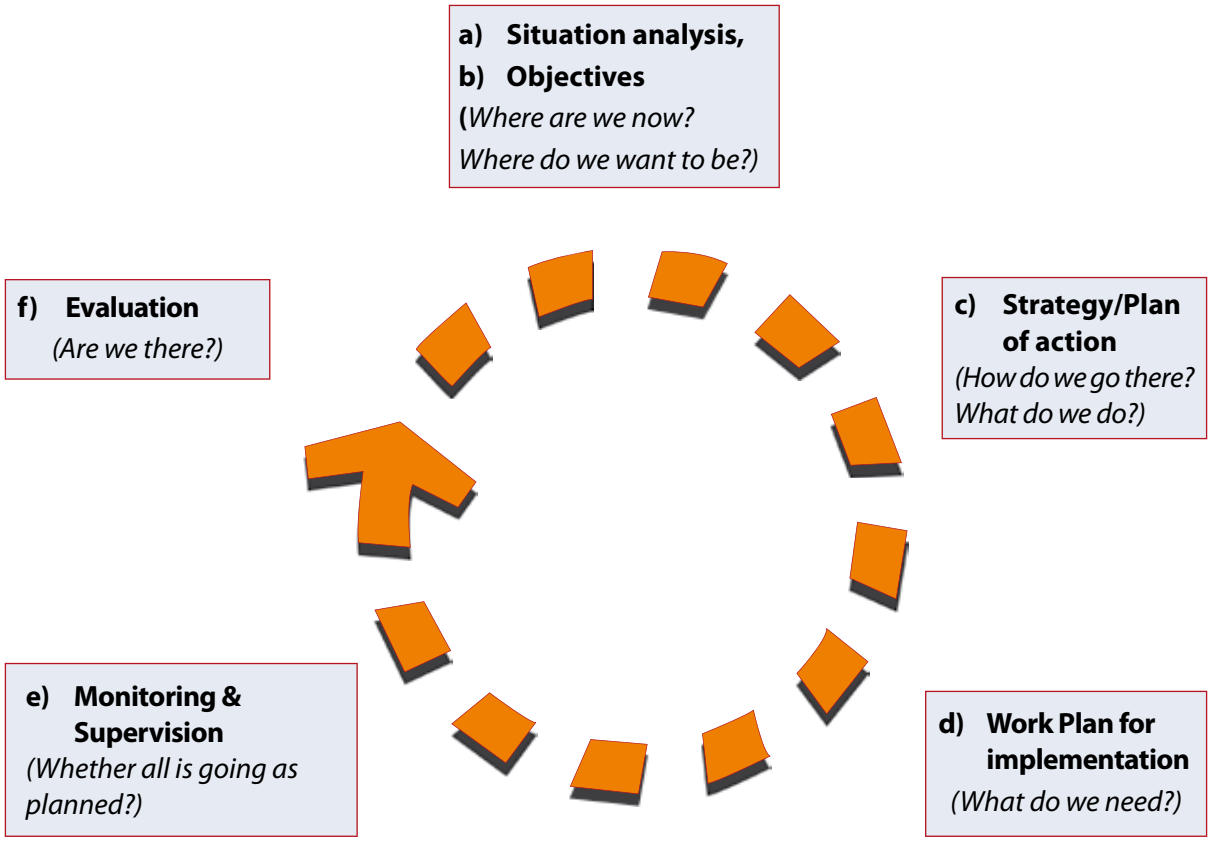


Fig. 12.1 Planning cycle

be indicative enough to help prioritization of activities and allocation of budget for different sectors. During planning at block level it is useful to include people from diverse sectors to bring in a range of perspective – each from his/her own lens. The team players will be:

- Sarpanch and *Pradhan* from *Panchayat*
- Representative from the district planning team,
- Child development project officer, ICDS,
- Block development officer,
- Block medical officer and health service provides,
- Education extension officer,
- Other community representative,
- Representatives of local NGOs/CBOs,
- Other line department officials linked with NRHM functioning at the block level.

It would also be important to include some very important stakeholders in the process of block level planning like.

- Representatives from existing Service Association of the Health Staff e.g ANMs association, *Anganwari* Association etc.
- Occupational groups like fishermen, miners etc.
- Representatives of marginalized (disadvantage) group especially. Women and the disabled.

- Situational analysis is also done by **SWOT** analysis (Strength, Weakness, Opportunities and Threats). It provides information on positive and negative aspects both within and outside the project. Detail of SWOT are as follows:
  - **Strengths & Weaknesses:** These are the resources and capabilities (within the organisation i.e. internal) that help or hinder the project to carry out leprosy control services. These strengths and weaknesses may be related to capability of staff and management, range of services available, organisational structure, financial management structure etc.
  - **Opportunities:** Opportunities are external factors/situations/circumstances, which are not under the control of the project or the programme and which are likely to affect/ help in improving the leprosy control activities. These factors or circumstances could be availability of funding agencies, availability of outside expertise etc.
  - **Threats:** Threats are also outside factors/situations/circumstances, which are not under the control of the project or the programme and these factors may influence the programme in negative way e.g. more importance given to other programme, stoppage of funding by international NGOs etc.

Through situational analysis, identify needs and problems of the community.

12.2.2 Formulation of 'Objective' or desired result

After analyzing the situation (i.e. where we are?) and having identified the problems and needs of the community, the next step is to think as to how to solve the problem and where do we want to reach (result) or what do we want to achieve in the programme (objective). Objective or result is like a destination or the end result or output and outcome of the activities. An objective should be SMART:

S: Specific: Objective/Goal should be specific e.g. there should not be any ambiguity. It should not be vague. Instead of saying improved awareness about leprosy; it should be "improved awareness about signs and symptoms of leprosy" or "improved awareness about availability of free treatment and curability" etc. Similarly in relation to disability it should be, "disability Grade–1 or Grade–2 among new cases" or "disability Grade–1 or Grade–2 among cases under treatment" or "total disabilities".

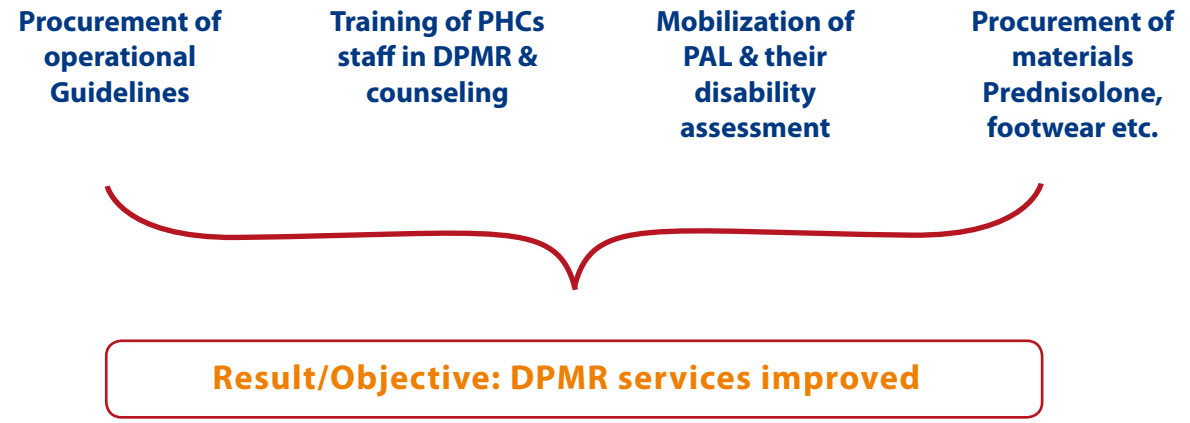
M: Measurable: It is difficult to understand the quantum of disabilities from the statement "The disabilities are reduced". How one would know whether they're really reduced. It is better to understand if we state that the awareness about sign and symptoms of the diseases has risen from say 40% to 80%, or proportion of Disability Grade–2 among new cases (specific) is reduced from 5% to 2% (measurable).

A: Acceptable & achievable: The objective, which the programme or planners want to achieve, should be achievable. Plan/objective should not be over-enthusiastic. Never plan to achieve objective which can not be achieved in relation to deadlines, numbers etc. In addition, the objective should be acceptable to all involved in the planning process.

R: Relevant & Realistic: Objective should be relevant and realistic. While planning for leprosy Control Programme, we should not think of achieving vaccination coverage of polio or achieving 85% cure rate in TB patients as these are not relevant to leprosy related problems and the objective should also be realistic means we should not plan to achieve the objective, which cannot be achieved in desired time e.g. no new case of leprosy by 2010 or to reduce disability Grade–2 among new cases from 5% to 0 % in one year.

T: Time frame: The objective should specify the time by which it has to be achieved. For example, if we want to achieve decrease in proportion of disability cases, we should be clear as to within how much time this reduction will be possible; so that at the end of this time, we can measure whether we have achieved that objective.

A number of activities are required to be implemented to reach the destination or achieve the objectives/results. The example is as under:



How to measure whether Objective is achieved?

Now we have to measure whether the activities, which were performed, led to the achievement of desired result or objective.

Example: One of the objective/result which is to be achieved under NLEP, is **Improved DPMR services.** During the implementation of the programme, one needs to know whether one is moving in the right direction to achieve the desired result/objectives and whether those results/objectives have been actually achieved. This is monitored/measured by single or a number of Objectively Verifiable Indicators (OVIs). Indicator is a tool, which measures change. Health programme indicators are depicted as a rate, ratio or proportion.

E.g. few Indicators to monitor/measure DPMR services may be:

- **Proportion of cases assessed for disability status** will be monitored through nerve function assessment'. What do we want to achieve is that all (100%) of new cases must be assessed for disability status and monitored by palpation of nerves and VMT/ST. This Indicator could be calculated as:

$$\frac{\text{Number of cases assessed for disability}}{\text{Number of cases put on treatment}} \times 100$$

- **Proportion of cases at risk of developing disability** will be assessed by nerve function assessment. All (100%) cases (measurable) at risk of developing disability (specific) are monitored by VMT/ST (relevant). This could be calculated as:

$$\frac{\text{Number of cases assessed with VMT/ST}}{\text{Number of cases at risk}} \times 100$$

- **Proportion of disabled cases practicing self care,** what do we want to achieve is that: All i.e. 100% cases (measurable) with disability are trained in self care (specific) and practice self care (relevant) by the end of 2010 (time bound).

  This could be calculated as:

$$\frac{\text{Number of persons practicing self care}}{\text{Number of persons trained in self care}} \times 100$$

12.2.3 Plan of action and work plan for implementation

In the planning cycle, after setting the objectives or results, number of activities required to achieve those results/objectives are enlisted. e.g. to achieve the objective 'DPMR services improved', a number of activities could be planned as under:

- Procurement of logistics e.g. operational Guidelines, MCR footwear etc.
- Training of PHCs staff in DPMR and counseling
- Mobilization of disabled and their disability assessment
- Identification and management of neuritis and Lepra reactions
- Developing self care group, referral for RCS and post operative care etc

After enlisting the activities, plan as to when these activities will be conducted, who will be responsible for implementation of these activities, what resources will be required including budget and then from which fiscal source this activity will be funded.

12.2.4 Activity planning: An example of training for health workers

Table 12.1 Activity planning for training of health workers

Activity	Training of Health workers
Duration & Date	3 days, 15th – 17th October
Responsible person(s)	MO (PHC)
Required items	Venue, travel, learning material, OHP, Black Board Stationery etc.
Budget	Explained in the next table below refer table 12.2
Funding resource	District Health Society (Leprosy)

Table 12.2 Example of budget calculation

Activities	Items required	*Budget calculation with example	Total
1. Training of Health Workers	Venue	Rs. 500/per day	500.00
	Travel (to & fro) for trainers	Rs. 100 (fare) x 2 (to & fro) x 2 in number	400.00
	Travel (to & fro) for Participants	Rs. 60 (fare) x 2 (to & fro) x 30 in number	3600.00
	Per diem/D.A. for trainers	Rs. 200 (Per Diem of 1 day) x 3 days x 2 persons	1200.00
	Per diem/D.A. for participants	Rs. 75 (Per Diem of 1 day) x 3 days x 30 persons	6750.00
	Lunch/tea	Rs. 50 x 3 days x 40 Persons	6000.00
	Stationery & Misc.	Rs. 50 x 30 persons	1500.00
		Total	**19950.00**
2. Training of Anganwadi worker	.....	.....	.....
3. Procurement of prednisolone	.....	.....	.....
4.			

* *Rate used for calculating budget in the table is arbitrary. The reader is requested to use the rate as per their state/GOI norms.*

Table 12.3 Tabular presentation of final/complete Plan of Action for improvement of DPMR service (an example)

Objective: DPMR Services improved						
Activities		**Responsible Staff**	**Duration & Date**	**Items required**	**Budget (details in annex)**	**Funding source**
1	Training of Health Workers	Medical Officer	3 days, 15th to 17th October……	Travel, per diem, Stationery etc.	19950.00	District health Society
2	Training of Anganwari worker	…….		…….	…….	…….
3	Procurement of Prednisolone	…….	…….	…….	…….	…….

To be clear as to which activity will be planned in which month, it is always helpful to prepare an activity schedule, which can be put in the form of a Gantt chart (Table 12.4).

Table 12.4 Activity Schedule (Gantt chart)

Act. No.	Activities	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar 09
1.	Training of Health Workers												
2.	Training of *Anganwari* worker												
3.	Procurement of Prednisolone												
4.	Etc.												
5.													
6.													
7.													

Gantt chart helps us in distributing the activities to be carried out month wise. This also helps us in keeping the track of the activities (monitoring). While preparing the plan, we can also get an idea whether many or few activities are planned in one month. If we see that many activities are entered in a particular month, we can re-adjust and space our activities accordingly.

12.3 Planning document

Whole of the plan can be produced in the form of a document, which could be prepared under following headings and submitted to NRHM to be included in PIP for the state:

Executive summary is the brief of the planning document which describes whole planning process and it is derived from the chapters written in the documents. Chapters of the documents can be divided as follows:

1. **Introduction:** This should include brief description of the district/PHC (e.g. geography, demography, culture etc.), about leprosy eradication programme of the district, achievements made so far, problems encountered and why this plan is made and the year of planning.

2. **Situation analysis:** A brief description of epidemiology of leprosy, progress of essential indicators (over the last five years), evaluation findings, if any, block level consultations and SWOT analysis.

3. **Objectives/ results**

4. **Activities**
   - Schedules with responsible persons and budget
   - Gantt chart

5. **Implementation arrangements**
   - Planning for Monitoring, Supervision and Evaluation
   - Management arrangements including procurement of logistic organising and conducting management information system etc.

6. **Annexes**
   - Map
   - Detailed budget calculations
   - References if any

Chapter 13 Monitoring

Structure

13.1 Introduction

13.2 Monitoring the planned activities

13.3 Monitoring the programme

- 13.3.1 Records & Reports
- 13.3.2 Epidemiological Indicators for monitoring the programme
- 13.3.3 Monitoring of stock and store
- 13.3.4 Meetings and feedback

Learning Objectives

At the end of the session trainees will be able to:

- ☞ Describe monitoring and its process
- ☞ Describe different records to be maintained and reports to be generated
- ☞ Enumerate, calculate and interpret indicators for monitoring the programme
- ☞ Describe analysis of reports and sending of feedback

Teaching method: Lecture discussion, group exercises

13.1 Introduction

After preparing plan of action and enlisting the activities for implementation, one has to keep track and ensure that the activities are being carried out as per the plan and that these activities are leading to desired results/objectives. This process is a continuous process and is known as monitoring. It helps in detection of any delay, discrepancy or deficiency, in carrying out the planned activities during early stages so that, corrective actions can be taken timely.

At the PHC level, two types of monitoring may be done:

- Monitoring of the planned activities
- Monitoring of the programme i.e. outcome of activities

13.2 Monitoring the planned activities

Medical Officers are supposed to monitor the implementation of activities as per the approved Project Implementation Plan (PIP) under NRHM and ensure that the proposed activities for Block PHC, Sector PHC, Sub-Centres and at community level, are carried out and completed within time frame in accordance with the operational Guidelines. They have to ensure that the activity wise earmarked budget is utilised, which can be verified from component wise Statement of Expenditure (SOE). Medical officer shares the responsibilities of implementation of activities with the assistance of other members of the health team at the health facility like BPO, BEE, PMW, HS etc. Medical Officers should ensure that the activities are integrated and implemented under NRHM. Each and every activity carried out should aim to improve quality of services provided to beneficiaries.

13.3 Monitoring the programme

Medical Officer should also monitor continuously whether the programme objective/outcomes like reduction in disease burden, high treatment completion, reduction in transmission of disease etc. are being achieved and that there is improvement in quality of service delivery to people affected by leprosy.

Procedures used for monitoring are:

Medical officer ensures maintenance of records and uses one or more of the following procedures/tools for monitoring the programme and its activities.

- Following the Gantt chart (as per the approved PIP).
- Using maps, graphs, charts, pie diagrams as a monitoring tool,
- Checking the records and reports for completion, regular updation and any discrepancy between records and reports.
- Checking the reports for accuracy, completion in all respects and timely submission.
- Analysis and interpretation of available data and reports.
- Calculation, analysis and comparison of indicators with previous reports/other indicators and their interpretation.
- Conducting field visit (supervisory visits) and direct observation of the activities.
- Checking of drug stocks for adequacy, quality, expiry dates.
- Conducting meetings.
- Providing feedback and taking corrective action.

13.3.1 Records & Reports (Refer Annexure–XV for reporting formats)

Maintenance of accurate and complete records is essential for imparting good quality services and to monitor the programme activities and programme outcome. Various records to be maintained at primary level and reports to be sent from PHC are as under:

❖ Patient card	LF – 01
❖ PHC treatment record	LF – 02
❖ Leprosy drug stock record	LF – 03
❖ NLEP monthly reporting form	MLF – 04
❖ Disability Register	Form – P-I
❖ Assessment of Disability and Nerve Function	Form – P-II
❖ Record of Lepra Reaction/Neuritis (LRN) cases	Form – P-III
❖ Prednisolone Card	Form – P-IV
❖ Referral Register	Form – P-V
❖ Referral Slip for health workers to refer to PHC	Form – P-VI
❖ Referral Slip for MO PHC	Form – P-VII
❖ Profile of disabled leprosy cases at PHC.	Form – P-VIII

Medical officers at PHC must ensure that the blank Patient cards (LF–01) are available and person is registered for treatment after confirmation of diagnosis of leprosy, fill the patient card themselves and put their signature on the card. Ensure that details of case as per patient card are entered into PHC treatment register (LF–02) and registration number derived from this register is entered into Patient cards (LF–01). First dose of MDT is given from common pharmacy and the date is entered both in Patient Card (LF–01) and Treatment register (LF–02) by the pharmacist. As per the convenience of the patient, subsequent doses of MDT are provided from the nearest Sub Centre and Patient card is handed over to the concerned health worker of the sub centre through the health supervisor. Treatment register (LF–02) at PHC is updated by the health worker/health supervisor on every Sector PHC or Block PHC meeting. Drugs are stored properly in cool and dry place and leprosy drug stock record (LF–03) is maintained and updated by the pharmacist of PHC.

NLEP monthly report is generated by the health supervisor every month after updation of Treatment Register (LF–02) & Drug stock register (LF–03). Before signing the report MO should verify that all the columns are complete and crosscheck figures from Treatment record (LF–02) and Drug stock register (LF–03).

MO should also ensure that the Disability register, and other records (Form P.I to P VIII) are maintained as per DPMR Operational Guideline.

13.3.2. Epidemiological Indicators for monitoring the programme

I. Main Indicators

1. Annual New Case Detection Rate (ANCDR)

ANCDR is the main indicator for monitoring National leprosy Eradication Programme (NLEP). It reflects burden of the disease as well as transmission of the disease and is calculated as below:

$$\text{ANCDR} = \frac{\text{Number of new cases detected during the year (from 1st April to 31st March)}}{\text{Population as on 31st March}} \times 100{,}000$$

This indicator is assessed at district level on 31st March every year. However, at block level only number of cases detected should be recorded for every month/year to assess the trend over the period. This should be kept in mind that number of case detection may go down due to floods or unforeseen circumstances and proportion may not reflect the true picture to have useful information from this indicator, the definition of new case should be strictly followed,

which is "a case with signs of leprosy, who has never received treatment before" provided methodology of case detection does not change.

2. Treatment Completion Rate (TCR)

Under NLEP, TCR is to be calculated for PB/MB, Male/Female and Urban/Rural areas separately, every year in the months of May–June. Calculation of TCR is done as below:

$$\text{PB TCR} = \frac{\text{Number of new PB cases who completed MDT in 9 months}}{\text{Number of new PB cases who started MDT in cohort of one year back}} \times 100$$

$$\text{MB TCR} = \frac{\text{Number of New MB cases who completed MDT in 18 months}}{\text{Number of new MB cases who started MDT in a cohort of two years back}} \times 100$$

Selection of cohort for TCR:

While selecting cohort for TCR, ensure that the last person entering the cohort has time to complete the treatment. i.e. PB patients are allowed nine months and MB patients 18 months to complete the full course of MDT. Hence, for calculating TCR for PB Leprosy, select a cohort, which ends at least nine months before the reporting date. Similarly for MB patients cohort must end at least 18 months before the reporting date (Refer Fig. 13.1 & 13.2).

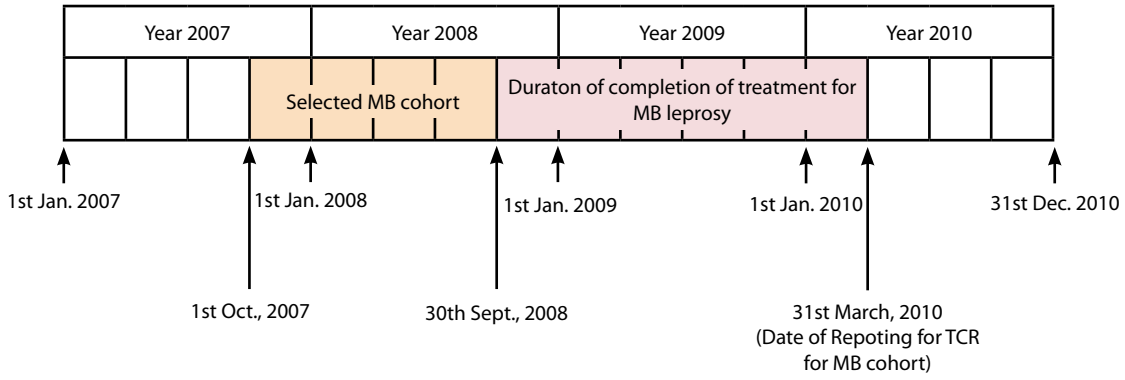


Fig. 13.1 For repoting Treatment Completion Rate for MB cases on 31st March, 2010 MB cohort is selected from 1st Oct. 2007 to 31st Sept. 2008

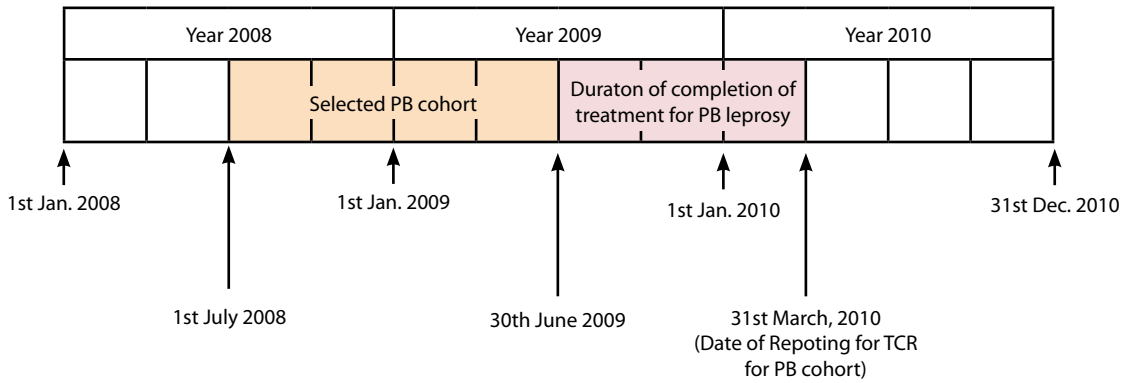


Fig. 13.2 For repoting Treatment Completion Rate for PB cases on 31st March, 2010; PB cohort is selected from 1st July 2008 to 31st June 2009

When the treatment completion rate is low, the medical officer should monitor and assess the factors responsible for this low completion of treatment.

(Please refer Annexure XIV – Detailed Guidelines on TCR estimation circulated vide letter No. M.12014/9/2007-Lep. (Coordn.), dated: 30th July 2007.)

3. Prevalence Rate (PR)

The prevalence rate is to be calculated as point prevalence as on 31st March, every year, and not on monthly basis, as below:

$$\text{PR} = \frac{\text{Number of balance cases under treatment as on 31st March}}{\text{Population as on 31st March}} \times 10{,}000$$

As indicated in various recent Guidelines, the Prevalence Rate is not a good indicator for use, after the elimination of Leprosy as a public health problem has been achieved at the National level. However, the PR value may be continued for assessments of disease load upto state level for some more time or till all states achieve elimination. It indicates the magnitude of problem i.e the total cases registered and undergoing treatment at a point of time. It is useful for assessing MDT requirement and also reflects efficiency in patient management (timely discharge of patients).

II. Additional Epidemiological Indicators

1. Proportion of grade-2 disability

This is calculated as under:

$$\text{Proportion of grade-2 disability} = \frac{\text{Number. of grade-2 disabled cases detected in a year among new cases}}{\text{Total new cases detected in a year}} \times 100$$

The proportion of grade-2 disability amongst new cases detected at the time of registraton for treatment in a year, gives a rough indication of how early the Leprosy cases are coming forward for diagnosis. Since the number of people with grade-2 disability may be small in some areas, it should also be recorded in numbers, which also gives an idea as to how many cases need special care like surgery, ulcer care etc. These cases are dealt on case to case basis.

2. Proportion of grade-1 disability

It is calculated as under:

$$\text{Proportion of grade-1 disability} = \frac{\text{Number of cases with grade-1 disability detected in a year among new cases}}{\text{Total new cases detected in a year}} \times 100$$

This also gives a rough estimation of late detection of cases with missed/delayed diagnosis. Since the number of disability grade-1 may also be small in some areas, it should also be recorded in numbers, which gives an idea as to how many cases need special care like self care, footwear etc. These cases should also be dealt on case to case basis.

3. Proportion of female cases

The indicator is calculated as below:

$$\text{Proportion of female cases} = \frac{\text{Number of female cases detected in a year}}{\text{Total New cases detected in a year}} \times 100$$

The proportion of female cases amongst newly detected cases in a year gives an indication whether the women have adequate access to diagnostic services. The ratio of two males to every one female is commonly seen. Very low proportion of female cases needs some action to improve access.

4. Proportion of MB cases

The indicator is calculated as:

$$\text{Proportion of MB cases} = \frac{\text{Number of MB cases detected in a year}}{\text{Total New cases detected in a year}} \times 100$$

High proportion of cases with MB Leprosy among new cases indicates delay in detection of Leprosy cases and high quantum of infection in the community. It is also useful guide to know that the risk of complications is high.

5. Proportion of child cases

The indicator is calculated as:

$$\text{Proportion of child cases} = \frac{\text{Number of child cases (under 15 yrs) detected in a year}}{\text{Total New cases detected in a year}} \times 100$$

High proportion of children among new cases indicates high transmission. The proportion of child cases when monitored over several years may show a trend. If the transmission of Leprosy declines in an area, it is expected that the proportion of children affected will also decrease.

All the above indicators are to be calculated on yearly basis as on 31st March. Monthly recording of actual number of new cases detected, MB, child, Grade-2 disability and female cases is important to detect any sudden change that needs investigation and corrective action.

Indicators should not be interpreted in isolation.
Try to interpret an indicator in relation to other indicators, to get an indication for the cause of the problem that can be investigated further to take a corrective action.

III. Quality of service Indicators:

Additional indicators that are used for assessment of quality of services being provided under the programme are as given below

1. Defaulter Rate

The indicator is calculated as below

$$\text{Defaulter Rate} = \frac{\text{Number of cases defaulted (continuous absence for three months in PB and six months in MB) from taking treatment}}{\text{Total Number of new cases started treatment as a cohort}} \times 100$$

The purpose of calculating the proportion of defaulters is to assess case holding at the health centre i.e. whether the workers and the staff are sensitive to the needs of the patients and ensure that none of the patients under treatment default (remain absent for 3 or 6 months as the case may be).

The reasons, for defaulting from the treatment, should be ascertained by the medical officer. Discontinuation of treatment due to other reasons like patients left the area, death of patient due to any reason and refused taking treatment can be calculated separately in exactly the same way.

2. **Number of relapses reported during the year**

Only the number of cases who are suspected to have relapsed may be indicated in the reporting format and should be referred to higher centre for confirmation.

3. **Proportion of new cases diagnosed correctly (should be calculated after validation by MO I/C of block PHC or District nucleus)**

This is a supervisory indicator and wrong diagnosis should be assessed on case to case basis to provide on the job training/coaching. The indicator is calculated as below:

4. **Proportion of new cases correctly diagnosed**

This indicator is calculated as below:

$$\text{Proportion of new cases correctly diagnosed} = \frac{\text{Number of cases correctly diagnosed}}{\text{Number of new cases validated}} \times 100$$

The accuracy of diagnosis should be assessed through regular supervision. If proportion of cases with wrong diagnosis/classification is high, concerned staff and authorities are informed to take action and help the health functionary to improve competency. A sample of the new cases should be validated within three months of diagnosis being made.

5. **New disabilities rate among cases under treatment**

This indicator is calculated as below:

$$\text{New disability rate} = \frac{\text{Number of cases with increased EHF score during treatment}}{\text{Number of cases put under treatment in a year (cohort)}} \times 100$$

This indicator is a measure, of early detection of new nerve damage and quality of care being provided through programme. Under Disability Prevention and Medical Rehabilitation plan, cases that develop new or additional disability are to be recorded and reported through the monthly progress reports.

13.3.3 Monitoring of stock and store

MDT must always be available for patients at PHC; stock of MDT must be managed according to the number of patients registered for treatment as per GOI Guidelines. (Annexure XIII)

Medical officer must check the Leprosy drug stock record (LF 03) regularly, physically verify the stock, its quality, date of expiry etc and relate it to the monthly progress report. If during this exercise any

shortage, or over stock, or short expiry drugs are found, immediate corrective actions should be taken in the form of indenting and procuring the required quantity of MDT, shifting of excess stock or near expiry stock to DLO office for distribution.

Medical officer of the PHC must also ensure that sufficient drugs are indented and procured for unforeseen events, e.g. flood calamity, cyclones etc. and also take into account the tentative number of cases which may require accompanied MDT.

While indenting the drug, care must be taken to consider the requirement of patients being treated as **"other cases"** to avoid unexpected shortage of the drugs. Prednisolone used for treatment of reaction cases should always be available. If it can not be indented it can be purchased through Rogi Kalyan Samiti (RKS).

13.3.4 Meetings and Feedback

Regular staff meetings are held at sector PHC and Block PHCs to discuss the progress made in implementation of planned activities, bottlenecks encountered, discuss possible solutions; seek guidance and cooperation from Districts/State authorities. Depending on the discussions in the meeting, modifications should be made in the planning schedule. During this meeting feedbacks should be given to the staff in relation to their functioning. This feedback should not be critical but in discussion mode and they should be encouraged to perform better. Progress in achievement of programme objectives can also be discussed with appropriate measures to be taken to improve the outcomes.

Chapter 14 Supervision

Structure

14.1 Introduction

- 14.1.1 What is supervision
- 14.1.2 The Objectives of supervision
- 14.1.3 Principles of supervision

14.2 Process of supervision

- 14.2.1 Supervision cycle
- 14.2.2 Preparation for supervisory visit
- 14.2.3 Activities involved in supervision
- 14.2.4 Activities involved in follow up of supervision

14.3 Skills of supervisor

14.4 Do's for effective supervision

14.5 Sample supervisory checklists

Learning Objectives

At the end of the session trainees will be able to:

- ☞ **Define supervision, describe objectives and principles of supervision**
- ☞ **Describe skills and procedure (Planning, Field visit and feedback) of supervision**
- ☞ **Enumerate and explain supervisory skills**
- ☞ **Prepare check list for supervision**

Teaching method: Lecture discussion, filed visit, group exercises to prepare check list and role play to demonstrate supervisory skills

14.1 Introduction

14.1.1 What is supervision: Supervision is a way of ensuring and improving staff competence and effectiveness through observation, discussion, guidance, support and on-the-job training.

14.1.2 The objectives of supervision are to ensure that:

- The technical skills required for Leprosy control activities are present,
- Any obstacles, faced by the peripheral health workers, are identified and removed,
- Plans, for future work and improvement in performance are made,
- Health workers are supported and motivated in their work and,
- Additional information, not available under the routine reporting system, is collected and analyzed to act towards improvement of performance of health staff,

14.1.3 Principles of supervision

Supervision is not a fault finding exercise but is carried out in supportive environment assessing the quality of work or analyzing individual staff performance. Supervisors work with the staff, observe supervisees performing the activities, review records and reports and critically analyze the situation. If supervisors observes some discrepancy between what is expected and what is observed they discuss it with the supervisee, demonstrate the skills and ask the health worker to repeat it in their presence, so that the supervisee becomes confident in performing the task. Supervisor also communicates with the staff and other stakeholders including beneficiaries to find the reasons affecting the quality of the services being provided. Such an on the job coaching and guidance improves the performance of the worker.

Good supervision is based on the following principles.

- **Open communication:** Communication must always be open and two way. Supervisor must take the communication in right spirit to find problems and must not take it as complaint.
- **Autonomy:** Supervisee must be provided adequate independence and should be made self-sufficient to perform an activity in their work situations. The ultimate goal of supervision is to make the person competent to carry out the tasks efficiently and effectively as per the job requirement.
- **Flexibility:** Adequate flexibility in approach is allowed to carry out a particular activity.

14.2 Process of supervision

14.2.1 Supervision cycle

Supervision for Leprosy can be conducted simultaneously while visiting health centre for other health programme.

MO is responsible for supervising the work of Health Assistants, Multi-Purpose Workers (M/F), Pharmacist, Lab Technician, Public Health Nurse and other supportive staff. Supervision is a continuous activity in which the visits are made in the field, activities are observed, gaps are identified, guidance and coaching is given, supervision report is prepared and the feedback is given to the supervisee as well as to the higher authorities. Frequency of supervisory visit depends on performance of the staff/centre, number of staff to be supervised and available resources. Poorly performing staff/centres are visited more frequently.

14.2.2 Preparation for supervisory visit

In order to carry out supervision in a systematic manner, the supervisor must plan their supervisory visit and make the following preparations:

- **Study of relevant documents:** Review the relevant documents for example any Guidelines issued, out come expected, report of previous supervisory visits, periodic reports of health centre and district reports and any feedback to previous reports.
- **Identification of priorities for supervision:** On the basis of job descriptions of the staff (Refer chapter 2), study relevant documents, available information and supervisory reports; identify areas/sub-centres with problems. Draw a checklist as per the requirement of specific centre for use during supervision. This checklist will spell out the job descriptions, activities and tasks to be observed e.g. multi purpose worker imparting health education, relevant questionnaire for assessing the knowledge about Leprosy, technique of sensory testing and self care practices, etc. (a sample checklist is given in section 14.5).
- **Preparation of supervision schedule:** Date wise Advance Tour Programme (ATP), should be prepared by 25th of every month. This ATP will be determined by the needs identified during preparation for supervision/previous visits. The ATP should be communicated in advance to District Programme (Leprosy) Officer/Chief Medical Officer and centres to be supervised.

14.2.3 Activities involved in supervision

During the visit one must introduce him/her and explain the purpose of visit, get familiar with the staff and develop rapport. Observe skills and activities being performed without dictating or instructing the staffs, make notes of observations, analyse the findings, know whether the staff knows and understands their job responsibilities. Review Documents (records and registers) maintained at the health centre for completeness, correctness and updated information. Interact with health workers positively, answer all the queries thoughtfully. If needed interview and examine the patients, demonstrate correct procedures.

During supervisory visit, observe the supervisee but never interrupt especially in the presence of the patient unless it is critical. In critical situations where immediate corrective action is required the supervisor tells the supervisee and the patient that the procedure/action can also be done in the way demonstrated. The supervisor can encourage the supervisee by asking the supervisee to repeat it for the patient once more. Explain the reason for interruption after the patient leaves and correct the technical aspect of the task. The purpose is respect the dignity and self esteem of the supervisee in his/her work environment.

14.2.4 Activities involved in follow up of supervision

After coming back from the field the supervisor prepares a tour report (Supervisory Report) with details of the places visited, details of staff met and their observed performance, his critical analysis of the situation, gaps found, actions taken (which were discussed with the supervisee and other health staffs) to fill up the gaps. The supervisor also mentions in his report; the institutional set up developed or required to be developed for the place of visit to improve efficiency and performance of the staffs that would lead to improvement of quality of services. The copy of tour report (Supervisory Report) is circulated to District Programme (Leprosy) Officer/Chief Medical Officer, centres and persons supervised and an office copy kept for future reference.

14.3 Skills of supervisor

Four basic types of skills identified for supervision of health care functionaries are:

- **Clinical skills** required for examination of a patient and assessment of patient's clinical status.
- **Human relation skills** refer to knowledge about human behavior and ability to work well with people.

- **Administrative skills** mean knowledge about the organisation and its functioning (how it works).
- **Decision-making and problem-solving skills** mean ability to analyse information and to reach a joint decision based on facts.

14.4 Do's for effective supervision

1. **Know your staff:** Know the people working with you by their name. Everybody likes to be called by his/her own name. Know what they expect, how they differ.
2. **Stay in contact with them:** Get away from your desk, mix and move around with your staff. Difficulties start when supervisors loose contact.
3. **Be a good listener:** Studies have shown that one of the most appreciated qualities of a supervisor is his ability to listen.
4. **Know when to make decisions yourself and when to ask for help from the Group:** As supervisor, it is your duty to see that the necessary decisions are made. Depending on the situation, decide whether you make the decision by yourself or involve others too. Consensus decisions are usually most effective but this is not always possible.
5. **Foresee problems:** Always try to look ahead and foresee what difficulties people may face while carrying out your decisions.
6. **Be concerned both about task and about your men:** People treated with trust and respect see the programme goals as their own and are more productive.
7. **Keep Cool:** Your men can lose their tempers but as their supervisor, you cannot lose yours.
8. **Be fair:** Don't play favorites. Justice is blind.
9. **Take responsibility, don't run away from it:** You grow as a person by taking responsibility. Stand up and be counted.
10. **Develop your staff:** By motivating, training, involving people in-group decisions builds their trust in your supervision.
11. **Know yourself:** A good supervisor knows himself. He knows his strong as well as his weak points. Knows the kind of support needed from the staff.
12. **Be yourself:** Don't pretend or bluff. When you say something, mean it. Remember a worker takes very seriously what a supervisor says to him.

14.5 Sample supervisory check list

Characteristics of the Check list for supervisory visit:
Check list should:

- Neither too long, or it will become cumbersome.
- Nor too short, or it will not give adequate information.
- Be based on the tasks for which health workers are responsible. If the tasks of health workers changes, then the checklist should also change accordingly.
- Incorporate or refer to the national or district Guidelines or manual when a specification is needed on how well a task has to be performed.

Supervisory Checklist *(Sample)*

Supervisory check-list for Medical Officers

1.	Making correct diagnosis with classification	Yes/No
2.	Making NFA	Yes/No
3.	Doing patient counseling	Yes/No
4.	MDT availability adequate	Yes/No
5.	Referral and feedback system appropriate	Yes/No
6.	Management of reactions	Yes/No
7.	POD and self care activities	Yes/No
8.	Capacity building of in-house staff	Yes/No
9.	Master register maintained	Yes/No
10.	Timely submission of MPR by 5th of every month	Yes/No
11.	Punctuality of staff ensured	Yes/No
12.	Stock register maintained	Yes/No
13.	IEC material displayed properly	Yes/No
14.	Cleanliness of PHC premises	Yes/No

Supervisory check-list for ANMs

1.	Is she involved in Leprosy work	Yes/No
2.	If so, does she keep records of Leprosy patients	Yes/No
3.	Does she give counseling to the diagnosed patients and informs patients about possible side effects of drugs	Yes/No
4.	Is she: 1. Suspecting the cases and getting confirmation by MO. 2. Contacting the family of patients and examining them 3. Visiting the house/neighbourhood of the patients if so, whether proper family counseling done. 4. With the help of ASHA, ensures the completion of the treatment of patients.	Yes/No
5.	Does she give Leprosy awareness through IEC material, IPC etc. to the community on village health day?	Yes/No

Supervisory check-list for Pharmacists

1.	Availability of MDT as per Guidelines	Yes/No
2.	Availability of Prednisolone and supportive medicine for reactions to patients	Yes/No
3.	Drugs stored appropriately	Yes/No
4.	Distribution of MDT as per time before expiry date	Yes/No
5.	Timely indenting of MDT on proper prescribed format	Yes/No
6.	Counseling of patients for regularity of MDT and normal side effects	Yes/No
7.	Check physical quantity, date of expiry, medicines	Yes/No
8.	MDT stock register maintained properly	Yes/No

Annexure I

National Leprosy Eradication Programme

Salient features of the National Leprosy Eradication Programme are:

1. 'Leprosy Eradication programme' is a centrally sponsored National Health Programme.
2. NLEP is decentralized, funds are sent through state health societies.
3. NLEP functions under umbrella of National Rural Health Mission (NRHM).
4. Quality of services and sustainability is the main focus.
5. Disability Prevention & Medical Rehabilitation (DPMR) is a priority.
6. Removal of stigma and discrimination is a part of strategy.

The National Leprosy Control Programme (NLCP) was launched in 1954-55. The strategy of NLEP was based on controlling the disease through reduction in the quantum of infection in the population and reduction in infective source, thus breaking the chain of disease transmission. The programme, therefore, had been planned on the following basic activities:

1. Survey and case detection.
2. Registration of cases for treatment.
3. Provision of continuous treatment with Dapsone to all cases, as close to their homes as possible.
4. Education of patients, their families and community at large about Leprosy.
5. Correction of deformities through care after cure programme.

Treatment with MDT was introduced under NLEP in phased manner in the year 1983 and programme was renamed as National Leprosy Eradication Programme.

At the 44th World Health Assembly held in 1991, WHO and its Member States committed to eliminate Leprosy as a public health problem by the year 2000, elimination being defined as prevalence below one case per 10,000 population. The Government of India was also a signatory to this commitment. To enhance the process of elimination, the first World Bank supported project on NLEP was started in the year 1993-94 and MDT made available to all the registered cases.

The Second World Bank supported National Leprosy Elimination Project was started for a period of three years from 2001-02. This phase was implemented with the following objectives:

- Decentralization of NLEP responsibilities to States/UTs through State/District Leprosy Societies.
- Accomplish integration of Leprosy services with General Health Care System (GHS).
- Achieve elimination of Leprosy at National level by the end of the Project.

A large number of voluntary organisations have been playing a pioneering role in anti-Leprosy work in India. While some of them were engaged in training, education and research, others

were also engaged, in case detection, treatment, rehabilitation and control work. A large number were voluntary, while some received grants from governmental organisations and others from international agencies.

In the Post elimination period, NLEP needs to expand the scope of Leprosy services provided to the patients, their families and community at large. The aims and objective under the 11th Plan (2007-2012) calls for:

- Further reducing the Leprosy burden in the country,
- Provide good quality Leprosy services,
- Enhance Disability Prevention and Medical Rehabilitation,
- Increase advocacy towards reduction of stigma and stop discrimination and Strengthen monitoring and supervision.

These objectives are also in conformity with the global strategy issued by WHO (2006–2010).

New Paradigm – In view of the need to sustain Leprosy services for many years to come, there has to be a shift from a campaign like elimination approach, towards the long term process of sustaining integrated high quality Leprosy services, which in addition to case detection and treatment with Multi Drug Therapy, also include prevention of disability and rehabilitation.

To get the programme move in the desired direction, the New Paradigms in NLEP have been detailed as below:

I. Burden of Leprosy

The burden of Leprosy can be looked at in three ways:

(a) Firstly, the most relevant epidemiological measure of the burden of Leprosy is the incidence of disease, which is the number of persons developing Leprosy during a defined period usually one year. Because Leprosy is an insidious disease, number of cases detected/ registered for treatment is generally lower than the actual number of incident cases for that time. Hence, incidence is difficult to measure directly and New Case Detection Rate (NCDR) is used as a proxy for incidence rate.

(b) Secondly, the burden may be related to the registered prevalence of disease, which is the number of people on treatment at a certain point of time. Although registered prevalence was a useful indicator to achieve the Leprosy elimination milestone, it is not an effective indicator to reflect changes in the epidemiological trend of Leprosy.

(c) Thirdly, the burden of Leprosy can be viewed as disability and deformity produced by Leprosy.

II. Improving the quality of services

The quality of care depends on the quality of technical supervision provided by the programme and availability of strong back up from an effective referral system. Quality Leprosy services means treatment by MDT is available at all the health units without any geographical, economic or gender barriers. Services provided are patient–centred; observe patient's rights, including the rights to timely and appropriate treatment, providing privacy and confidentiality. The quality Leprosy services addressing each aspect of case management, based on firm scientific evidence like diagnosis is carried out timely and accurately with supportive counselling, timely treatment with MDT, free of charge in a user friendly environment; appropriate disability prevention interventions; referral for complications and appropriate rehabilitation, maintaining simple records and encourage review and evaluation.

The services must be based on principles of equity and social justice. Equity means that Leprosy patients should have the same opportunity to attend health services that are of sufficient quality to

deal with their problems. Social justice means an absence of discrimination for any reason, including type of disease, level of disability, race, gender, social class or religion.

III. Integration of Leprosy services with primary health care system for sustainability

Integration means active involvement of general health services in Leprosy control activities. The general health care services take full responsibility for Leprosy control in their areas, as part of their routine day to day activities.

When we refer to case detection, it is important to recognize that in order to achieve Leprosy eradication, nearly every case of Leprosy in the community should be identified. In practice this does not happen in many situations. The major focus is on creating community awareness about the disease, its curability and the availability of MDT services.

Over the years the technology for diagnosis and treatment has been simplified to a great extent making it possible for general health care staff to deal with Leprosy effectively.

IV. Referral services and long term care

Effective Leprosy control requires an integrated approach, which implies that Leprosy control activities are implemented by the general health services, including integrated referral facilities. The referral network must be part of the integrated system, providing referral services for other diseases and conditions in the area e.g. district hospitals or medical colleges. Community health centre with adequate infrastructure, trained manpower and appropriate equipment may serve as first referral unit in the referral network. Referral services needed are ophthalmology for significant eye pathology; Dermatology for diagnosis of difficult skin conditions; laboratory for skin smears and histopathology, Physiotherapy for assessment and management of disability, Podiatry for the feet and footwear, occupational therapy for rehabilitation and adaptations, plastic surgery for reconstruction of body part and community based centres for socio-economic rehabilitation.

V. Prevention and management of impairments and disabilities

The current situation with regard to the number of persons living with Leprosy–related disabilities and impairments may need reassessment, particularly at national level. In addition, programme should ensure that persons affected by Leprosy have access to services by other programmes dealing with other disabling diseases or conditions.

Interventions aimed at preventing disabilities/impairments from occurring and/or worsening include early detection and effective management of Leprosy–related reactions and nerve damage, proper counselling on self care, participation of household members in home based care, development and use of locally produced and culturally and aesthetically acceptable footwear and other appliances.

VI. Improving community awareness and involvement

The major theme of community awareness is to provide accurate information about the disease, its curability and availability of services at the nearest health facility. The objective of such IEC efforts should be to encourage self–reporting of new cases and to reduce stigma and discrimination. There are four key messages for the general public that include **early signs of Leprosy, its curability, encourage people to support Leprosy affected people** to live a normal life and **no need to fear** as disease can be managed just like any of other diseases; can be expressed in many different ways.

VII. Support of National Rural Health Mission

Under the National Rural Health Mission (NRHM), institutional mechanisms have been created at each level to support National Health programmes and improve delivery of health care services.

At village level there is multi stake holders – village health and sanitation committee to decide the health priorities in the village and their appropriate solution. There is also Accredited Social Health Activist (ASHA) for every village. She is a female volunteer belonging to the same village, selected by the community. Services of ASHA could be utilized for early detection of suspected cases of Leprosy, referral of such cases to nearest health centre for confirmation and completion of treatment. Rogi Kalyan Samities at PHC, CHC and district hospitals are autonomous registered bodies constituted at each level to facilitate in management of hospitals and delivery of quality care to patients. The NLEP will be benefited by working in coordination with other programs under the NRHM. District Health Mission which is chaired by the president of Zila Parishad may be helpful for advocacy of the program.

VIII. Rehabilitation

Leprosy is feared because of the occurrence of disabilities it causes, very little has been done in this area. There are several reasons for this, inadequate efforts to develop effective tools and failure to address the issue through integrated services for all disabled in the community. The problem, in social, economic and human terms is enormous and will need many partners to solve it, including the affected communities.

A comprehensive approach to rehabilitation is needed to maximize the benefit for the individual, family and society at large. Community Based Rehabilitation (CBR) approach emphasizes community participation and empowerment of the affected individual. Govt. of India/State Government has schemes for providing financial support to disabled persons. We have to ensure that persons affected with Leprosy are also included in these schemes.

The Ministry of Health & Family Welfare and Ministry of Social Justice & Empowerment, GOI are expanding rehabilitation services to the persons with disabilities.

Persons affected by Leprosy, who are in need of rehabilitation, should have access to any existing (general) rehabilitation services. Similarly, where Leprosy specific rehabilitation services are available, people with other disabilities should be given access. This facilitates integration, helps to break stigma and promotes sustainability of rehabilitation services. Harmonization of rehabilitation services provided by public and private sectors would be crucial in making such services a realty.

NLEP – Operational aspects: Many operational factors affect the outcome of the programme. Some of the common operation factors affecting the programme are:

1. Availability of various Guidelines issued from Central Leprosy Division, GOI.
2. Supervision to improve the quality of services by check on wrong diagnosis, wrong classification, wrong registration, drop out cases, record keeping and delay in providing services.
3. Regular review meetings to see the implementation, progress and outcome of planned activities.
4. Vertical & horizontal communication (organisational) with its feedback.
5. Check on delay in self reporting of new cases and defaulters retrieval.
6. Improved accessibility to services by 'user- friendly- approach'.
7. Mobility for field workers and officers.

Annexure II

Referral System for Persons Affected with Leprosy

Majority of the persons affected with Leprosy can be managed at PHC because diagnosis of Leprosy is generally is based on clinical findings especially demonstration of sensory deficit and involvement of peripheral nerves. Treatment of Leprosy has been simplified with introduction of Multi Drug Therapy (MDT) and operational definition for "cure" has been redefined. But a small proportion of the persons may need specialised care and close monitoring and must be referred.

Referral System under NLEP

Previously, referral services were being provided by specialized institutions. After integration of NLEP with general health care system, referral facilities at secondary and tertiary level are being developed; medical officer at PHC must be aware of institutions providing referral services in their state and those in the neighbouring state. State Leprosy officer/District Leprosy officers/ medical officers of district nucleus team can be contacted to provide this information to medical officers, PHC.

Indications for Referral of persons affected by Leprosy

Persons in following situations need treatment and close monitoring that can be provided at referral centres. For details refer respective chapters.

1. **Diagnosis:** Suspected Leprosy where cardinal signs cannot be elicited clinically should be referred. Early form of Leprosy and lepromatous Leprosy are difficult to diagnose. All such patients need to be referred for diagnosis and classification.
2. **Lepra reaction** (especially neuritis/iridocyclitis) is an important complication contributing directly to disability and deformity. Expert advice may be required for diagnosis, initiation of steroid therapy and follow up. Some patients may need to be started on Clofazimine for recurrent ENL or weaning from steroid dependency. Reaction cases not responding to prednisolone and recurrent reactions should be referred.
3. **Starting MDT/**steroids in special situations like early pregnancy, tuberculosis, severe anaemia.
4. **Drug related side effects** like Jaundice, Dapsone hypersensitivity, abdominal colic need care at referral centre.
5. **Clinical events** during post treatment period:
   - Lepra reaction occurring after completion of treatment
   - Relapse

Both can occur simultaneously. It is difficult to differentiate from lepra reaction.

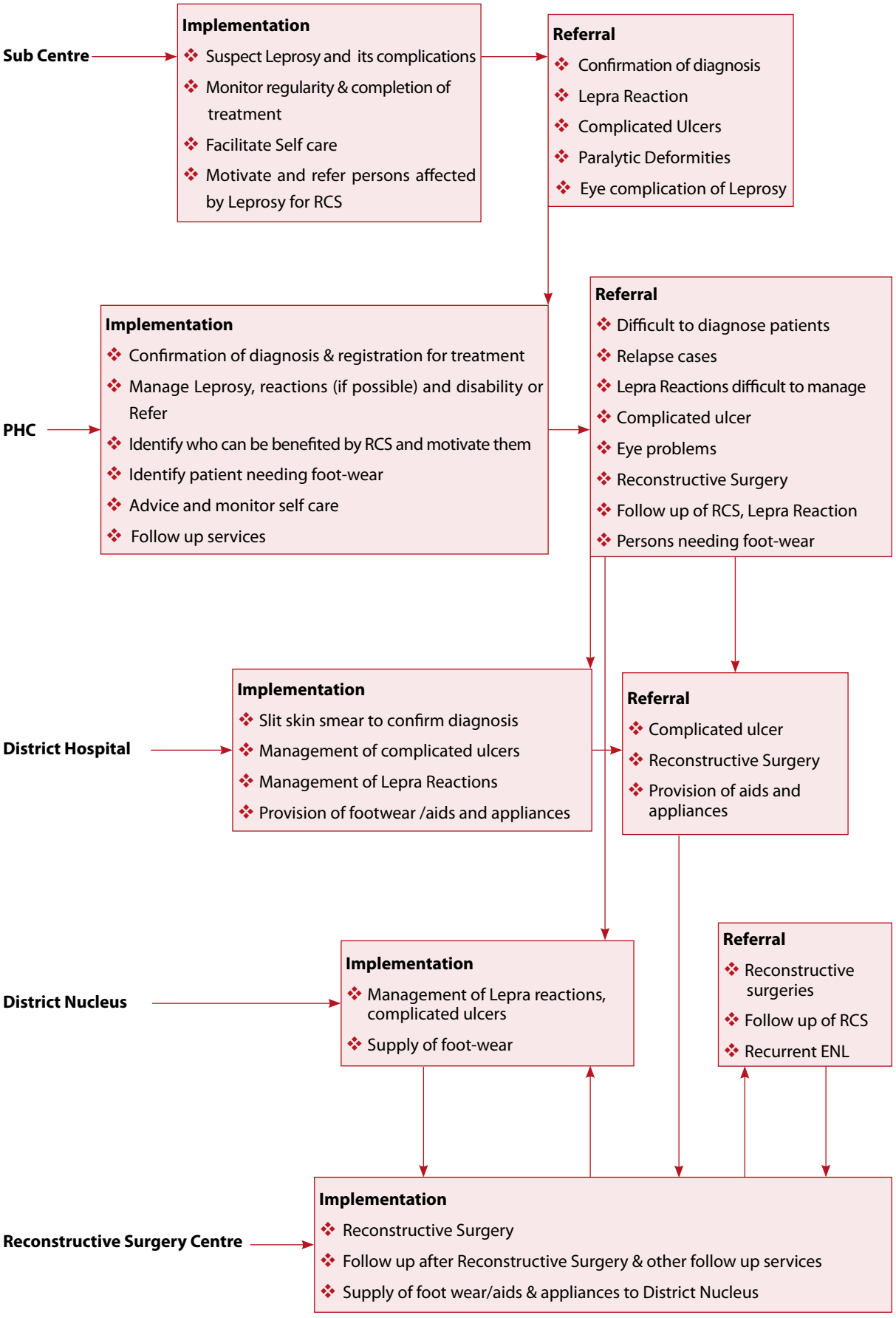
6. **Physiotherapy** for motor weakness, paralysis, contracture
7. **Secondary complications** like chronic ulcer, infected ulcer need special care
8. **Persons requiring reconstructive surgery** for nose, eye brow, eye lid, hands and feet

9. **Surgical intervention** may be required for following complications
   - Neuritis not responding to steroid for surgical decompression
   - Ulcer with bone involvement for sequestrectomy
   - Hot foot for fixation of small joints
   - Gangrene of toes or malignant ulcer for amputation
10. **Special footwear** for deformed foot
11. **Socio-economic Rehabilitation/occupational therapy**

For more details refer respective chapters.

The Medical Officer of health facility should have list of referral facilities including contact details and services available in each centre. Timely referral can preserve functions, prevent disability or its worsening.

Referral System



Annexure III

Differential Diagnosis for Leprosy

Differential Diagnosis of Flat Lesion

BIRTH MARK OR NAEVUS

- Present since birth
- Edges sharply defined saw tooth appearance
- Normal sweating
- Sensations intact
- Triple response normal
- Along line of Blaschko

VITILIGO

- Depigmented lesion
- Sweating normal
- Sensations intact
- White hairs on lesion

CONTACT DERMATITIS

- Itching common
- Sensations intact
- On exposed-contacting part
- History of acute oozing phase

LICHENOID DERMATITIS

- Sensation normal
- Patch itchy
- Hypo-pigmented to violaceous
- Small lesions coalescing

TINEA VERSICOLOR

- Sensations normal
- Patches have variable mild itchy ness
- Seasonal
- Fungus can be demonstrated
- Start around hair follicle opening
- In seborrhoeic sites

SEBORRHOEIC DERMATITIS

- Sensations normal
- Sever itching on patches
- Scalp commonly involved
- Oily yellowish scales

SCAR

- History of injury/trauma
- Sensation may or may not be present

Differential Diagnosis of Raised Lesions

GRANULOMA ANNULARE

- Annular lesions (ring shaped) over extremities
- No sensory impairment or nerve changes
- History/family h/o Diabetes may be persent

GRANULOMA MULTIFORME

- Large –dramatic geographic patches without skin sensory changes
- Nerve involvement absent

RING-WORM

- Sensations normal
- Scaly appearance at periphery of patches if untreated
- Itchy patches.
- Superficial look
- Fungus can be demonstrated (if untreated)

LYMPHOMA

- Sensations normal
- Long standing lesion
- Associated lymphadenopathy hepato- splenomegaly
- Nerves normal

LUPUS VULGARIS (Skin TB)

- Sensations usually normal
- Lymph node involvement
- Area of healing with scar
- Erythematous area of activity

PSORIASIS

- Silvery- Scaly lesions on extensor surface
- Sensations normal
- On scraping leaves bleeding points (Auspitz sign)
- Increases during winter/ summer (seasonality)
- Joint involvement may be present

Differential Diagnosis of Nodular Lesions

NEUROFIBROMATOSIS

- Coffee-ground coloured macules
- Soft multiple nodules, painful on pressure (sometimes)
- Skin smears negative for M. leprae
- Familial
- Present since birth/early childhood

DERMAL LEISHMANLASIS

- Nodules/infiltration on face, even on earlobe
- History of kala-azar
- Skin smears negative for M. leprae
- No sensory changes
- No nerve abnormalities

XANTHOMATOSIS

- Skin coloured to yellow nodules papules plaques on tuberosities (bony prominences)
- Uncommon condition
- Skin smears negative for M. leprae
- Blood cholesterol level high
- No nerve lesion

Differential Diagnosis of Neurological Conditions:

- Post infectious (viral) peripheral neuropathy
- Diabetic Neurophathy
- Alcoholic Neuropathy
- Syringomyelia
- Tabes-dorsalis

1. Post Infectious (VIRAL) peripheral neuropathy

- Acute/sub-acute onset
- Correlation (temporal) with recovery from viral illness
- Neuritic symptoms heralds onset, may quieter later
- Variable sensor/motor loss-different from Leprosy
- No nerve thickening/skin patch

2. Diabetic neuropathy

- Distal bilateral neuropathy
- 'Glove & stocking' type of anaesthesia
- 'Burning feet' syndrome
- Knee and ankle reflexes lost
- High blood sugar level
- Peripheral nerves normal on palpation

3. Alcoholic neuropathy

- Patient has alcoholic history
- Face that of an alcoholic
- Red-angry tongue
- Cheilitis (Inflammation of the lips) often present

4. Syringomyelia

- Uncommon condition
- Disease of CNS
- Cause unknown
- Temperature and pain sensation lost
- Touch sensation present
- Peripheral nerves not enlarged

5. Tabes-dorsalis

- A variety of neurosyphilis.
- Intense, recurring lightening pain in legs
- Stamping type of gait
- Romberg's sign positive
- (Inability to stand erect with eyes closed & feet together)
- Knee reflexes absent
- Common Peroneal nerve normal

Annexure IV

Clinical Aspects of Ridley-Jopling's Classification of Leprosy

Observation or test	Type of Leprosy				
	TT	BT	BB	BL	LL
Number of lesions	Single usually	Single or few	Several	Many	Very many
Size of lesions	Variable	Variable	Variable	Variable	Small
Surface of lesions	Very dry, sometimes scaly	Dry	Slightly shiny	Shiny	Shiny
Sensation in lesions (not face)	Absent	Moderately or markedly diminished	Slightly or moderately diminished	Slightly diminished	Not affected or minimally affected
Hair growth in lesions	Absent	Markedly diminished	Markedly diminished	Slightly diminished	Not affected
AFB in lesions	Nil	Nil or scanty	Moderate numbers	Many	Very many (plus globi)
AFB in nasal scraping or in nose blows	Nil	Nil	Nil	Usually Nil	Very many (plus globi)
Lepromin test	Strongly positive (+++)	Weakly positive (+ or ++)	Negative	Negative	Negative

AFB = Acid-fast bacilli; TT =Tuberculoid; BT = Borderline tuberculoid; BB = Mid-borderline; BL= Borderline lepromatous; LL = Lepromatous;

Note: 1) **PB=** Paucibacillary (1–5 skin lesions/single nerve trunk); **MB** (6 or more skin lesions/ 2 or more nerve trunks)

2) **Indeterminate Leprosy:** Single or few asymmetrically located macules with vague/ doubtful sensory impairment considered and treated as PB Leprosy. The immunological status of these patients are in evolution and not stable/settled.

3) **Pure Neural Leprosy:** Some patients have a clinical form of disease limited to nerve involvement alone. It may be of PB type if, only one nerve trunk is affected or of MB type when more nerve trunks are affected. These patients can be classified in the Ridley-Jopling scale on analysis of AFB, Lepromin, Granuloma type etc. in the nerve biopsies.

Annexure V

Bacterial Index (BI) and Morphological Index (MI)

M. leprae can be seen lying singly or in clumps in a split skin smear, stained with Zeihl–Nelson method of staining. On treatment with MDT bacilli die but dead bacilli are eliminated slowly and remain in the tissue for long time, even on completion of treatment for 12 months because their elimination from the tissue takes a long time. *M. leprae,* like other mycobacteria, stains red with Carbol Fuchsin and resists decolorization with acid/alcohol, even when dead. A lab technician examining skin smears during treatment, may get the impression that the patient is not improving, despite regular and adequate treatment, unless one can differentiate living bacilli from dead bacilli. Familiarization with the appearance or morphology of the bacilli, seen after Zeihl-Nelson's staining, is important, since living bacilli appear as uniformly stained rods (solid-staining) and dead bacilli appear irregularly stained (fragmented bacilli) or as granules (granular bacilli). Hence, two types of indices are reported.

Bacterial index

The density of bacilli in smears is known as the **bacterial (bacteriological) index (BI)** and includes both living and dead bacilli. It can be recorded in Ridley's logarithmic scale This is based on the number of bacilli seen in an average High Power microscopic field, using an oil-immersion objective (1/12 in or 2mm).

Ridley's Logarithmic Scale for BI

6+ Many clumps of bacilli (> 1000) in each field (on an average)
5+ 100–1000 bacilli in each field (on an average)
4+ 10–100 bacilli in each field (on an average)
3+ 1–10 bacilli in each field (on an average)
2+ 1–10 bacilli in 10 fields
1+ 1–10 bacilli in 100 fields

When several smears are taken, mean index is calculated. In bacilliferous (MB) patients, on treatment, it may be found that there is no fall (or only a slight fall) in the **BI** during the first 12 months, because dead and living bacilli are both being counted (both being stained by carbol fuchsin), but after this, a steady fall in density of bacilli takes place over the next 5 –10 years. With adequate and effective treatment BI declines by 1 log /year i.e. 1+ per year.

Morphological index

A more sensitive index of bacteriological improvement is required for patients; hence introduction of a system of classifying the bacilli in smears into two groups, solid stained (living), and irregularly-stained (dead). Gerhard Hansen, (in 1895) was the first to put forward the view that granular bacilli should be considered dead. The **morphological index (MI)** is the percentage of solid stained bacilli, calculated after examining 200 red staining elements, lying singly, and this index indicates whether the Leprosy is active, responding to treatment,

and whether the patient has defaulted on treatment or developed bacterial resistance to chemotherapy. An increase in MI therefore indicates a worsening of the patient's condition, and a decrease indicates improvement. In general, it can be said that the MI of lepromatous patients, commencing treatment, will be somewhere between 25 and 75 (%) and there is a steady fall in MI to zero in 4–6 months of multi-drug therapy.

Of the two indices, it should be noted that the BI is the most commonly used. The MI calls for consistently high standards of fixation, staining and microscopy which are not usually available outside referral centres, and is thus not routinely advised. Furthermore, it is important to note that the current WHO advice on skin smears in Leprosy is that the procedure to the essential minimum (particularly in the field setting), since all skin-piercing methods have the potential risk of transmitting HIV and HBV infection.

Annexure VI

Referral of Persons with Reaction before Starting Steroids

Pregnancy

Steroids affect the growth of the foetus. Steroids given during the third trimester, may suppress adrenal function of the foetus. All pregnant women requiring steroids must be treated at referral centre, so as to minimize the effect of steroids and new born infants of these mothers should be monitored closely for a few days after birth. Prednisolone is given in lower doses and/or for shorter duration, during pregnancy. To avoid harmful effect on foetus; refer all pregnant women with lepra reaction who require corticosteroid therapy.

Children

All children under the age of twelve should be treated with corticosteroids at a referral centre so as to minimize its effects on their growth. Children are also given lower dosages and/or for shorter duration and the starting dose of prednisolone should not exceed 1 mg per kilogram of body weight per day. Giving children steroids on alternate days may reduce the effect on their growth.

Diabetes

Corticosteroid therapy aggravates diabetes or, a person taking steroids may develop overt diabetes for the first time; consider the possibility of diabetes if a person develop typical symptoms like excessive urination and extreme thirst, usually accompanied by tiredness and lethargy, over a period of a few days to a few weeks or urine tests positive for glucose. persons affected by Leprosy with diabetes/suspected diabetes must be referred to higher centre to establish the diagnosis and then to monitor the response to treatment. These people may require injectable insulin.

Tuberculosis

Corticosteroid therapy makes tuberculosis worse. Suspect tuberculosis in person with cough for more than three weeks; this may be accompanied by fever and loss of weight. Investigate, confirm diagnosis and start treatment (ATT – DOT), before giving steroids. Always follow the national Guidelines for the diagnosis and treatment of tuberculosis.

Ulcers or Osteomyelitis

People with deep or complicated ulcers or osteomyelitis should be referred for surgery and intensive antibacterial treatment. Starting corticosteroids before treatment of sepsis will make sepsis worse and result in more permanent damage, including the need for amputation. Suspect osteomyelitis if the person's hand or foot is warmer than normal, with or without swelling. Any person with a wound discharging pus should be referred for surgical treatment before starting corticosteroids.

Eye involvement

People with eye lesions must be referred to specialist after preliminary treatment, for diagnosis and management at a centre properly equipped for eye care.

Corneal ulcers and keratitis are inflammatory conditions of the cornea, often caused by exposure due to inability to close the eye properly. Person presents with pain, photophobia, redness and often some loss of vision. The treatment usually consists of local antibiotics and a pad to provide rest and to keep the eye closed.

Iritis, uveitis, iridocyclitis and scleritis are all types of inflammation of ocular tissue and occur as part of a Type 2 reaction. These conditions cause pain, redness, photophobia and loss of vision, although the symptoms are not always severe. Steroids, whether taken by mouth or locally applied, may make these conditions worse. Start tetracycline and atropine eye ointment and refer.

Depression or Psychosis

Corticosteroids can modify these conditions or make them worse. Before starting steroids, refer anyone with a history of mental illness for diagnosis/management or on treatment for same; to higher centre for treatment with corticosteroids under expert supervision

Severe Type 2 reaction

Start corticosteroids and refer people with severe Type 2 reactions. These patients may develop critical organ involvement and require expert management. These patients are also prone to steroid dependence and may require addition of other immuno-modulating agents particularly in chronic ENL.

New nerve damage during treatment

Regularly monitor nerve function of patients on corticosteroid treatment. Person with deterioration of nerve function must be referred to the specialist, as they need further investigations and intense monitoring. While referring, same dose of steroids as was being taken by the person at the time of referral must be continued.

Late nerve damage

Some patients develop nerve damage due to delayed reversal reaction, more than a year after completing MDT, and will require corticosteroid therapy to prevent permanent nerve damage. Ensure that these patients are having a reaction rather than a relapse of Leprosy, as the symptoms of the two can sometimes appear similar. Suspect relapse when new skin/nerve lesions occur in different places from the old lesions. All such patients (with late nerve damage) should be referred to the expert/experienced specialist for decision regarding further management.

Newly diagnosed patients with nerve damage of more than six months' duration

If a person with involvement of nerves for more than six months duration comes for treatment of Leprosy; refer such a person to a higher centre as they need specialized treatment (apart from corticosteroids) to help recovery and prevent further damage.

Annexure VII

Stigma & Discrimination in Leprosy

I. Introduction

Leprosy is a disease, which strikes fear in the society as a mutilating, disfiguring, contagious and incurable disease. Leprosy has been a highly stigmatizing disease for centuries because it causes physical disfigurement and no cure being available until the 20th century.

No disease has been more closely associated with stigma than Leprosy, and it has become a metaphor for stigma. Persons affected by Leprosy were forced to leave their home and live in segregated areas and suffer economic and social losses (participation restrictions) causing physical and emotional distress. This is the only disease where the sufferer had to live in separate colonies, villages and even in distant islands.

Even after segregation, the societies and the governments made discrimination to the persons affected by Leprosy. A number of discriminatory laws were framed against such persons. At present, the situation has changed to a great extent. Now, Leprosy is curable and patient can live in their home during treatment. Because of early treatment, deformities and disabilities have reduced. Many discriminatory laws have been repealed all over the world. Yet, there is discrimination against the persons affected by Leprosy, which need to be removed from the Public mind, so that these persons can lead normal life like any other human being.

The repulsive physical image, the fear of infection and the belief that it is incurable are the root causes of the inhuman treatment that is often faced by those affected by Leprosy.

II. Stigma and its types

Stigma is typically a social process, experienced or anticipated, characterized by exclusion, rejection, blame or devaluation; those results from experience, perception or reasonable anticipation of an adverse social judgment about a person or group. Fear of stigma, and the resulting discrimination, discourages individuals and their families from seeking the help they need. Leprosy affected persons may face many problems like avoidance, negligence, separation, torture and less respect in society etc. because of which affected people hide their disease and do not seek treatment.

Hiding disease may relieve their anxiety initially but leads to unavoidable sufferings because treatable condition remains untreated, progresses and reaches a stage when it is no more treatable, to cause unavoidable suffering to the affected person.

Types of stigma

- **Felt stigma** refers in particular to the negative attitudes of the community felt or perceived by those with a stigmatized condition. **Internalized (or self-) stigma** refers the way sufferers feel, or perceive themselves to be at the receiving end of stigma. This usually includes reduced self-esteem ("I am no good"; "no one will want to marry a person affected

by Leprosy like myself"), hopelessness ("I can no longer do anything") and feeling of guilt or self-blame related to the stigmatized condition ("It is probably my own fault that I have developed Leprosy").

- **Enacted stigma** denotes actual occurrences of discrimination (e.g. divorce, denying someone's access to public transport) or negative behaviour (e.g. gossiping).
- **Institutional stigma:** Stigma or discrimination which is part of institutional arrangements or policies. This includes separate clinic arrangements for people affected by Leprosy, insufficient arrangements for confidentiality, laws sanctioning divorce or social exclusion on the basis of the disease. Man-made barriers (e.g. buildings without elevators, sidewalks without ramps) may also be seen as part of the same category, as it restricts participation of people with disability.

III. Determinants of stigma

(i) **Lack of knowledge:** Lack of knowledge about aetiology and curability, spread of the disease and whether it is hereditary or not, counts for irrational behaviour. Even educated and respected persons can become victim of misconception about Leprosy.

(ii) **Attitude:** Attitudes are powerful determinant of stigma. Attitudes are learned responses and are manifestations of socially shared past experiences and often defined in terms of beliefs (evaluation), affects (feelings) and behaviour tendency. Community attitudes are part of a cultural belief and value system. Change in experience provides opportunity to bring change in attitude.

(iii) **Fear:** Fear is a major driving force of stigma. People fear mainly two things: **deformity and social exclusion. Social exclusion includes** diminished marriage prospects for children or other relatives and reduced earning capacity. Fear of the **risk of transmission of the disease** is often seen even in doctors and other health workers who are not accustomed to working with Leprosy.

(iv) **Blame and shame:** Behaviour of the people strongly influenced by attitudes and beliefs prevailing in the society. Being part of the same community and culture, people feel ashamed of having Leprosy because they are blamed for having done something very bad to be punished in this way and suffering for 'their own fault'. For this reason people conceal the diagnosis as long as possible. People internalize these feelings and start withdrawing themselves from social participation. People abandon their own family, because they fear that their presence will have serious negative effects on the family.

IV. Discrimination

Discrimination is the treatment of an individual or group with partiality or prejudice. Discrimination is often defined in terms of human rights and entitlements in various spheres, including healthcare, employment, the legal system, social welfare, and reproductive and family life.

Stigmatization and discrimination: Sigma and discrimination are linked. Stigmatization reflects an attitude, but discrimination is an act or behaviour. Discrimination is a way of expressing stigmatizing thoughts, either on purpose or inadvertently. Stigmatized individuals may suffer discrimination and human rights violations. Stigmatizing thoughts can lead a person to act or behave in a way that denies services or entitlements available for other persons.

V. Intervention strategies

Stigma associated with Leprosy is deep rooted, evolved through centuries of misconceptions and myths. **The process of achieving the acceptance of the Leprosy patients in the community along**

with social status culturally acceptable in the absence of disease/illness should be treated as stigma reduction. The strategy to reduce stigma in Leprosy have to be mainly through:

Spreading awareness: Spread the demystifying messages and its interpretations, mainly regarding nature of disease, its cause, disease not being hereditary, role of immunity in occurrence of Leprosy, availability of treatment and so on. However, mere information and education, to all and sundry about the signs and symptoms of Leprosy and its curability, shall not work. It is imperative to break the barrier between persons affected by Leprosy and the rest of the society, by appealing to people's emotions and their ability to empathize with those they feared and shunned.

Interventions for reducing stigma may be required at five levels –Viz. intrapersonal, interpersonal, community, organisational/institutional and governmental level. Stigma reduction programs should use a combination of approaches. Promising interventions are empowerment, counselling, contact with affected persons and education.

Following steps may help in this regard –

1. **Developing understandings & concepts based on scientific knowledge:** Although most people have some understanding of Leprosy, many lack in-depth or accurate knowledge about Leprosy. For example, many do not understand that Leprosy cannot spread through ulcers in insensitive limbs of persons affected by Leprosy. Involvement of experts from Medical College and research organisation like JALMA (ICMR) should be useful.
2. **Preventing iatrogenic stigma:** Non discriminatory behaviour of health workers/ medical officers while examining and treating e.g. dressing the ulcers and counselling can help in preventing stigma. Integration of Leprosy services into general health care and practicing 'no isolation – no discrimination' policy in wards or OPDs, should be strictly followed.
3. **Involving communities/societies:** Strategies like Community counselling, group meetings and discussions using live case stories, incidences, involving treated Leprosy affected persons in discussion, developing "self care groups". Involvement of community in treatment provisions and Community Based Rehabilitation (CBR); based on sense of human dignity, equality and acceptance of Leprosy affected persons by the community and active participations between all three i.e. affected people, Health care provider/educator and the community may be used to reduce stigma.

VI. Suggested line of action under NLEP

1. The National Rural Health Mission carries out IEC for various health related activities including Leprosy. The State and District Programme Officers should coordinate with the respective NRHM IEC cell to incorporate Leprosy in all the communication strategies under NRHM.
2. Develop strategy with the involvement of the following six groups of persons as partners to fight stigma against person affected with Leprosy.

   a. **Civil societies:** It is crucial to identify the political and the prestigious organisations and work through their leadership to create a climate conducive to bring in changes in the mindset of all people. Proper advocacy efforts to involve the civic society at large will be useful only if action is taken at all levels i.e. National, State, District and Local.

   b. **Social activist:** A large number of national and international NGOs work in the country and support persons affected by Leprosy by providing curative

and rehabilitative services. They also work to remove stigma. Partnership with these organisations, other organisations like Bharat Scouts and Guides, Gayatri Pariwar, Faith Based Organisation (religious groups) and many others, engaged for the upliftment of the persons affected by Leprosy will be invaluable.

Involvement of celebrities like Actors, Artist, Musicians, sport persons; involved in social upliftment for spreading the messages through them may be very effective.

c. Health service providers:

- Demonstration of non discriminatory behaviour by all the Health service providers whether in the Govt. or outside.
- Involvement of practitioners of other system of medicines in spreading awareness.
- Involvement of not only Dermatologists but other specialists like Physicians, Surgeons, Orthopedicians, Plastic Surgeons, Physiotherapists, Microbiologists, community medicine specialists etc in the Medical Colleges/District Hospitals is also very important.
- Hospital managers and superintendents can support sigma reduction by making the hospital systems work without identifying the persons affected by Leprosy as a separate group to deal with.

d. Community/Opinion Leader: Opinion leaders can help by supporting and transforming community activities for support of persons affected by Leprosy through case detection and referral, ensuring regularity of treatment by the patients, their socio-economic rehabilitation and accepting a cured Leprosy in the society.

e. Corporate sector can be contacted to generate and provide jobs and trades especially suited to or useful for Leprosy patients like Smithy, Garment making, Carpenter and Crafts and allow them to work from their home.

f. Media :

1. Media persons are directly involved in spreading awareness. Continuous advocacy by media can play a positive role. Sensitisation of media personnel and writers, folk artists will help in spreading positive massages about disease. Advocacy through media is essential on continuous basis.
2. State level media coordination committees can be of great help in planning activities in the state.
3. Utilise village health and sanitation committee meeting on "Village Health Day" to spread specific messages about Leprosy through some of the experts for change in behaviour.
4. Develop and use effective, attractive and impressive of destigmatizing messages for communication through different media agencies.
5. During "Health Mela", organise 'care and concern camp' with trialogue and dialogues with the aim of combining services (Diagnosis, POD care) with BCC. Such camps organized jointly by community and health department with the purpose of demonstrating indiscriminatory behaviour and zeroing distances along with providing services and educating people have been found to give strong impact.

6. Women mobilization: Females of the self help groups may be sensitized about the disease and their services can be utilized to generate awareness in villages to reduce stigma.
7. Prepare and implement non-discriminatory behaviour Guidelines for service providers which include institutions and individuals. Separate Leprosy clinic room in PHC/CHC/SDH/District Hospital must be closed down immediately.
8. Empower the people affected by Leprosy to over come discrimination by supporting 'self care group' in Leprosy colonies. Involve the "Lok Doots" appointed by the National forum of persons affected by Leprosy, wherever needed.
9. "Sasakawa India Leprosy Foundation" has a number of schemes to support the persons affected by Leprosy and their children. Coordinate with the Executive Director, SILF, 228, Jor Bagh, New Delhi-110003, Ph. (011) 42403160, website *www.silf.in* and support such initiatives.

These are only a few suggested lines of actions. The programme officers at State/Districts may feel free to work out and implement measures to reduce stigma against Leprosy and remove discrimination against person affected by Leprosy.

VII. Key messages

1. **Human Rights issue:** All human beings are born free and equal in dignity and rights. This also includes persons affected by Leprosy (persons affected by Leprosy). Any legal, social and economic discrimination against persons affected by Leprosy is violation of human rights.
2. **Early reporting to health centre for diagnosis & treatment:** Undetected adults with Leprosy, transmit bacteria to children and adolescent. Therefore, the community should encourage early reporting to health centre in case of any suspicion of Leprosy.
3. **Use of words like 'Leper':** Words like 'Leper' or 'Kodi' are used to define people by their disease, which are very humiliating to the affected persons. Such words must be eliminated from vocabulary, and education for this should begin from the school level. The Lepers Act 1898 was repealed by the courts in 1983; therefore use of such terms is also unlawful.
4. **Self Respect:** Persons affected by Leprosy should be encouraged to overcome their shame and sense of helplessness and take a proactive role in preventing and solving their Physical, Social, Economic and Psychological problems.
5. **Persons affected by Leprosy helping other persons affected by Leprosy:** Persons affected by the Leprosy can provide effective support to the programme in the fight against stigma and discrimination, if asked for to help as Counselors, Teachers, Spokespersons and Lobbyists.
6. **Positive Slogans: Use of positive slogans like**
   (i) Leprosy is curable with MDT
   (ii) MDT is freely available in all PHC
   (iii) Discrimination against Leprosy affected persons is violation of human rights
7. **Caution to prevent:** Never start treatment for Leprosy unless the diagnosis is confirmed – thus one can prevent pushing a person and family to the world of stigma and discrimination.
8. **Educator not preacher:** Provide useful Health Education but do not try to preach.

9. **Cause of the disease:** Leprosy is caused by a Bacteria "Mycobacterium Leprae" and not because of any past sin or curse.
10. **Spread of the disease:** Untreated Leprosy patients are the only known source for M. leprae. It is transmitted from a Leprosy affected to a susceptible person via mainly the respiratory tract (droplet infection). The major sites from which bacilli escape from the body of an infectious patient are the nose and mouth. Nose appears to be the major port of entry of the bacilli. Leprosy do not spread by skin contact.

Annexure VIII Counselling

Counselling is a process of therapeutic communication. It is a helping process where one person (counsellor) explicitly and purposefully gives his/her time-attention and skills to assist a client (counsele) to explore their situation, identify and act upon solutions within the limitations of their given environment. Counselling is a method of identifying practical solutions to life or work related problems.

Beginning of counselling session (introduction)

As the patient enters the room, **greet** the person, call the person by name, welcome the client and make him/her comfortable. Introduce yourself if meeting for the first time and tell the person the purpose of the meeting (to understand the health problem and its best management). Encourage the counselee to talk about themselves.

I. Active attending or Listening: It is most important step in counselling because the details provided by the client are based on it. Active listening means reflection of feelings, questioning, paraphrasing and clarification. It includes listening carefully and paying attention to verbal as well as non verbal signals.

Provide in-depth information to relieve fears and worries of the client. Similarly, counsellor's words, expressions and posture/gesture (verbal/non verbal communication) indicate that attention is being paid to what is being said. By demonstrating an attending behaviour we enhance the client's self-respect, establish a safe atmosphere and facilitate free expression of thought by the counselee.

Similarly, actions of the counselee communicate many unexpressed feeling. Some of these nonverbal activities are **voice quality, breathing, eyes, facial expressions, leg movement and body posture.**

- **Reflection of content and feelings:** People respond differently to their illness. They may express their feelings as fear, anger, anxiety or sadness about disease. Do not try to stop, let the person express their feelings, do not stop patient/family members from crying. Do not take anger personally and try to stay calm.

  The counsellor must recognize such feelings in a direct, unemotional way. The focus is kept on the emotions of the client and his/her subjective experiences in coping with the situation.

  Counsellor reflects the contents and feeling of the other persons by responding back to the client and communicating a message though empathy, questioning or paraphrasing that conveys that counsellor is listening and trying to understand counselee's circumstances.
- **Questioning:** Always try to use questions and establish communications so that both the problem and the solutions are clear. Ask questions in order to clarify the situation and make client aware of all the dimensions of the problem and help the clients to understand the core issue underlying his/her fears or concerns. Do not ask too many closed questions (closed questions are those questions that can be answered by one word like yes/no). Ask

open questions to make communication easier, encourage further discussion and facilitate building of trust and warmth in the relationships.

Use questions containing why with caution as it may easily sound judgmental. If you need to use 'why', use it in the middle of a sentence and not in the beginning of a sentence.

- **Paraphrasing and clarification:** Paraphrasing is repetition of the jest of client's feelings by the counsellor in their own words. For example, "You seem to be saying that you are afraid that your family is not going to take care of you". The clients might then agree with the interpretation. If not, the counsellor can seek clarification by saying "will you please explain it with more details?" Utilizing this technique, the counsellor attempts to give feedback to the client; the essence or content of what the client has just said and clarifies understanding of the client's world. Clarification helps the client to come to understand themselves better. When you ask the client to explain something in more details or in a different way; by doing this clients not only explore their own feelings further, but will also feel that you are trying hard to understand their situation. In the process, counsellors also tell the client about the scientific facts not known to them.

II. Interpretation: Often people avoid focusing on the real problem and talk around the issue. Interpretation goes beyond what is explicitly expressed by the feelings and implied meanings of the client's statements. Even client is unaware of this. Counsellor *redefines* the problem from a different point of view to bring out more clarity to the problem and make client aware to the core problem. The counsellor also helps client to establish what is relevant, emphasising the important points – for example, "Of all the things you talked about today, it seems to me you are most concerned about...."

III. Repeating: At times of stress and crisis, clients are in a state of denial or feeling overwhelmed. They may not always understand everything they are told. As a counsellor, do not hesitate and repeat salient points of the discussion, statements of support or necessary facts. It ensures that the clients clearly understand the problem and requisite action. Client would usually convey that they understand and accept the information.

IV. Summarizing: Many people who are stunned by news of the disease may respond by talking quickly and trying to provide more details or ask more questions; than counsellor can absorb or comprehend. It is then helpful for the counsellor to interrupt at times and summarize what has been said. This is like paraphrasing and helps to ensure that each understands the other correctly. Summarizing towards the end of the counselling provides guidance and direction to both counsellor and counselee; to deal with practical matters of the problem and decide plan of action. A summary resembles a combination of reflection of feeling and paraphrasing over a longer period of time. At the end of each session, the counsellor should summarize the salient points of the discussion, highlight decisions which have been made and need to be acted on.

V. Confrontation: Many a time's clients are so much preoccupied with their fears that they cannot see the connection between their behaviour and the responses of the others. Confrontation involves a direct examination of incongruities and discrepancies in the client's thinking, feeling and/or behaviour. The counsellor tells the client that how their thoughts affect their action and behaviour, which in turn affect the behaviour of others towards them. For example, because of fear of discrimination, people withdraw themselves and do not speak to friends and relatives. Friends and relatives in turn also respond by not talking to them. Establishment of strong relationship and rapport is essential before commenting on such issues. It is a highly intrusive skill hence timing is very important and advice on confrontation must be delivered in an atmosphere of warmth, care and concern.

VI. Respecting: As a counsellor, try to appreciate that people see their problems in unique personal ways determined by culture, social class and personality. Respect client's views and beliefs and build on them. Show respect, for instance, by asking a client to explain different aspects of the culture or personal beliefs that are strange to you; for example, "you feel strongly about this. I don't know about it. Tell me more about it".

VII. Structuring or Prioritization: Structuring means helping the client to see relationship between facts and feelings. It helps clients to determine the important aspects of their concern that needs immediate attention and other less important aspects that can be put off until later. It is essential part of planning and probably one of the most critical skills in counselling.

VIII. Deciding the plan of action: Based on the scientific knowledge, cultural and socio- economic aspect of the client, help the client to explore all the possible solution for the prioritised aspect and choose the most relevant option for action. Encourage client to take their own decision and act accordingly.

IX. Concluding a counselling session: While ending the session summarize the salient points and decision taken, congratulate client for their efforts, wish them luck and fix next visit.

Annexure IX

Block Leprosy Awareness Campaign (BLAC)

In the year 2004-05, Government of India decided to extend focus of attention under National Leprosy Eradication Programme from endemic states to high priority district and blocks under special situational plan called Block Leprosy Awareness Campaign (BLAC). Under BLAC high priority districts and blocks are identified as per the fixed criteria. Special measures are taken in identified priority areas on a campaign mode every year during the months of September to November to increase awareness of the community for self reporting, detect hidden cases, improve case management, and bring down the prevalence rate in these high endemic areas.

A detailed situational analysis of the selected districts is carried out to make an action plan. For situational analysis, general status of programme implementation, block/Urban area wise analysis of data, quality of diagnosis and case management, cohort analysis for treatment completion rate for PB and MB, child proportion, MDT availability status in last two years, IEC coverage vis-à-vis district IEC plan in last two years, record keeping and reporting, programme supervision at different levels are considered and action plan is drawn. Following activities are undertaken during the campaign.

- **Capacity Building** of all the service providers in the health centres before the campaign including those working in urban areas, through one day orientation.
- **Need based IEC activities** are started by teams visiting the identified villages to spread awareness about Leprosy.
- To generate awareness and **detect hidden cases;** house to house visit in the identified endemic villages (villages reporting cases since last two years); by the team of paramedical and voluntary workers.
- **Services of trained health functionaries** are made available in all the health centres to confirm the diagnosis and register Leprosy cases for treatment.
- **Logistics** required are made available in these endemic blocks.
- Special provision is made for **supervision.**

Annexure X

Rehabilitation Services for Disabled Persons

I. Institutions under Ministry of Social Justice and Empowerment

Physical, occupational, social rehabilitation and financial assistance for purchase of Aids and Appliances are provided under Ministry of Social Justice and Empowerment with the basic objective to bring the target groups (disadvantaged and marginalized section of the society viz. schedule caste, minorities, backward classes, **persons with disability,** aged persons, street children and victims of drug abuse etc) into the main stream of development by making them self reliant. Services are available for the entire Indian nationals on payment of minimal fee. Provision of financial assistance for disabled persons is also available.

These services are provided by three types of Institutions.

1. **National Institutions:** Six national level Institutions have been established (i) to act as fore runner and trend settler in their area of specialization and (ii) to develop manpower for delivery of services to the disabled persons.

   These Institutions are:

   i. National Institute for Mentally Handicapped, Secundrabad, AP
   ii. National Institute for Orthopaedically Handicapped; Calcutta, West Bengal
   iii. Ali Yavarjung National Institutes for the Hearing Handicapped, Mumbai; Maharastra
   iv. National Institutes for visually Handicapped, Dehradun; UA
   v. Institutes for physically Handicapped New Delhi
   vi. National Institutes of Rehabilitation Training & Research, Olatpur Cuttack, Orissa

2. **District Rehabilitation Centre (DRCs)** were established to facilitate creation of infrastructure and capacity building at district level for awareness generation, Rehabilitation, training/ guiding grass roots level functionaries and provide comprehensive services to the persons with disabilities and handed over to State Government.

   Presently, eleven District Rehabilitation Centres (DRCs) are functioning in ten States under States Government.

   State wise location of DRCs is as follows:

Andhra Pradesh	-	Vijayawada
Chattisgarh	-	Bilaspur
Karnataka	-	Mysore
Maharastra	-	Virar (Thane)
Orissa	-	Bhubneshwar
Rajasthan	-	Kota
Tamil Nadu	-	Chengalpattu

Uttar Pradesh	-	Sitapur
		Jagdishpur
West Bengal	-	Mednapur

3. **District Disability Rehabilitation Centre (DDRCs):** Initially 149 centres were identified to provide above mentioned rehabilitation services through self sustaining centres. Till date 109 such centres are functioning in the country at district level and are usually located in the premises of a District Hospital. These centres function under the supervision of District Management Team (DMT) headed by District Collector and implementing agencies for these centres are NGOs.

4. **Services available and scope for linkages:** These centres are equipped to provide all the services like physiotherapy, counseling, occupational therapy, assistive devices and artificial limbs. Services of Psychologist, Psychiatrist, Physiotherapists, Occupational therapists prosthetic and Orthotic-engineers are available at these centres. Usually permanent fulltime senior level staff is available at DRCs and contractual / honorary part-time staff is available at DDRCs.

5. **Financial Assistance for purchase and fitment of Aids and Appliances** is provided to disabled persons under ADIP Scheme of GOI. Under the Scheme assistance is provide for aids and appliances, costing up to Rs 6,000/- to only those disabled persons who have disability amounting to 40% or more and whose total monthly income does not exceed Rs 10,000/-. As per the scheme 100% assistance (cost of aid and appliance up to Rs 6000/-) is provided to those disabled persons (> = 40% disability) whose total income does not exceed Rs. 6500 per month and 50% assistance is provided to disabled persons with income between Rs 6501 – Rs 10,000/month.

   Assistance is also provided for traveling cost of disabled person and one attendant limited to bus fare in ordinary class/railway by second class sleeper subject to a limit of Rs. 250/- each irrespective of number of visits to centre. Assistance for boarding and lodging at the rate of Rs. 30/- per day for maximum duration of 15 days is also available. This is given to only those whose total income does not exceed Rs. 6,500 per month.

Aids and Appliance provided to locomotor disabled persons are:

a. All type of prosthetic and orthotic devices.
b. Mobility aids like tricycles, wheel chairs, crutches, walking sticks and walking frame/relaters, Motorized tricycles costing more than Rs. 6000/- may be procured in exceptional cases but prior approval of The Ministry of Social Justice & Empowerment (MOSJ & E) on case basis is needed for these special cases.
c. All types of surgical footwear & MCR chappals.
d. All type of devices for ADL (Activity of daily living).

Eligibility of beneficiaries for financial assistance: A person with disability fulfilling following conditions would be eligible for assistance under ADIP Scheme through authorized agencies.

a. Should be an indian citizen of any age.
b. Should be certified by a Registered Medical Practitioner certifying that the concerned person is disabled and fit to use prescribed aid/appliances.
c. Person who is employed/self employed for getting pension and whose monthly income from all sources does not exceed Rs 10,000/months.
d. In case of dependents, the income of parents/guardians should not exceed Rs 10,000/- per months

Various activities conducted by these centres are:

- Survey and identification of persons with disabilities through camp approach.
- Awareness generation for encouraging and enhancing prevention of disabilities, early detection and intervention etc.
- Early Intervention.
- Assessment of need for assistive devices, provision/fitment of assistive devices, follow up/ repair of assistive devices.
- Therapeutic Services e.g. Physiotherapy, Occupation Therapy, Speech Therapy etc.
- Facilitation of disability certificate, bus passes and other concession/facilities for persons with disabilities.
- Referral and arrangement of surgical correction through government and charitable institutions.
- Arrangement of loans for self employment, through banks and other financial institutions.
- Counseling of disabled, their parents and family members.
- Promotion of barrier free environment.

To provide supportive and complimentary services to promote education, vocational training and employment for persons with disabilities through:

- Providing orientation training to teachers, community and families.
- Providing training to persons with disabilities for early motivation and early stimulation for education, vocational training and employment.
- Identifying suitable vocations for persons with disabilities, keeping in view local resources and designing and providing vocational training and identifying suitable jobs, so as to make them economically independent.
- Provide referral services for existing educational, training, vocational institutions.

II. Main types and definitions of disabilities

The P.W.D. Act, 1995 defines many aspects including various types of disabilities. They are:-

(1) Blindness

"Blindness" refers to a condition where a person suffers from any of the following conditions, namely:-

(i) Total absence of sight; or

(ii) Visual acuity not exceeding 6/60 or 20/200 (snellen) in the better eye with correcting lenses; or

(iii) Limitation of the field of vision subtending an angle of 20 degree or worse.

(2) Low Vision

"Person with low vision" means a person with impairment of visual functioning even after treatment or standard refractive correction but who uses or is potentially capable of using vision for the planning or execution of a task with appropriate assistive device.

(3) Cerebral Palsy

"Cerebral palsy" means a group of non-progressive conditions of a person characterized by abnormal motor control and posture resulting from brain insult or injuries occurring in the pre-natal, peri-natal or infant period of development.

(4) Hearing Impairment

"Hearing impairment," means loss of sixty decibels or more in the better ear in the conversational range of frequencies.

(5) Leprosy cured

"Leprosy cured person," means any person who has been cured of Leprosy but is suffering from –

(i) Loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye-lid but with no manifest deformity;

(ii) Manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity;

(iii) Extreme physical deformity as well as advanced age which prevent him from undertaking any gainful occupation, and the expression "Leprosy cured" shall be construed accordingly.

(6) Locomotor

"Locomotor disability" means disability of the bones, joints or muscles leading to substantial restriction of the movement of the limbs or any form of cerebral palsy.

(7) Mental retardation

"Mental retardation" means a condition of arrested or incomplete development of mind of a person, which is specially characterized by subnormality of intelligence.

(8) Mental illness

(i) "Mental illness" means any mental disorder other than mental retardation.

(ii) "Person with disability" means a person suffering from not less than forty per cent of any disability as certified by a medical authority.

(iii) "Medical authority" means any hospital or institution specified for the purposes of this act by notification by the appropriate Government.

III. Provisions for 'Persons with Disability' (PWD)

Provisions by Ministry of Social Justice & Empowerment –

The Persons with Disabilities: (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 has been enforced from 7th February 1996.

1. Prevention and Early Detection, of Disabilities by survey, investigation and research.
2. Every child with disability shall have the right to free education till the age of 18 years in integrated schools or special schools along with free books, learning material, uniform and scholarship.
3. 3% of vacancies in government employment shall be reserved for PWD, 1% each for persons suffering from: Low vision, Hearing Impairment and Loco motor disabilities including Cerebral Palsy.
4. No employee can be sacked or demoted if they become disabled during service, no promotion can be denied because of impairments.
5. Aids and appliances shall be made available to PWD. Disabled persons in need of aids and appliances are given travel allowance subject to a limit of Rs. 150/- for visit to implementing agencies/centre.
6. Allotment of land shall be made at concessional rates to PWD for house, business, special recreational centres, special schools, research schools and factories.
7. Public buildings, rail compartments, buses, ships and air crafts are designed to give easy access to PWD, wheel chair, ramps, Braille and sound symbols are to be made available.
8. Insurance coverage for the benefit of the government employee with disabilities.
9. Unemployment allowance to PWD registered with special employment exchange for more than a year. Pension to eligible PWD by state/UT.
10. National level institutes at Deharadun, Secunderabad, Mumbai, New Delhi, Kolkata, and Cuttack provide services such as physiotherapy, occupational therapy, restorative surgery, radiological investigations, vocational counseling/training/guidance, provide aids and appliances, rehabilitation related services, speech therapy, education and research.
11. **11 District Rehabilitation Centres** (DRCs) provide services for medical intervention, surgical correction, physiotherapy, aids and appliances, occupational therapy vocational trainings and job replacement.
12. **District Disability Rehabilitation Centres** (DDRCs) provide disability certificates, prevention and interventions required, repair of assistive devices, barrier free environment, vocational trainings and referral services.
13. **4 Regional Rehabilitation Centres** (RRCs) provides services to persons with spinal injuries and other orthopaedic disabilities.
14. **17 Vocational Rehabilitation centres** provide services free of charge, under Ministry of Labour in urban areas and Rural Rehabilitation Extension Centres & Mobile Camps for rural PWD.
15. **National Awards** for the welfare of people with disabilities every year on 3rd December, to organisations/individuals for outstanding work in the field of disability.
16. **Concessions** –
    - Indian Airlines allow 50% concession in the fair to blind persons on single journey.
    - Railways allows to travel at concession in the fair up to 75% to disabled and his/her escort.
    - Double conveyance allowance to Central government employees who are blind or orthopaedically handicapped.
17. Promotion of self employment among disabled by provision of loan up to 2.5 lakhs through National Handicapped Finance and Development Corporation (NHFDC).

IV. District Disability Rehabilitation Centres Under DRCS

S. No.	Name of the DDRC with full postal address
I. DRC , VIJAYWADA	
1.	**DDRC Krishna** C/o DRC Vijayawada Opp. Prabodha Bnook Centre, Gopal Reddy Road Governor Pet, State Guest House Campus, Vijaywada – 520 002
2.	**DDRC Anantpur** Shri Dasarath, Director Women Development Trust, Anantpur
3.	**DDRC Visakkhapatnam** Rani Chandravati Hospital Visakhapatnam
II. DRC, BILASPUR	
4.	**DDRC Raipur** Mana Camp (Campus of Home for Multiple Handicapped Persons), Raipur Chhattisgarh
5.	**DDRC Durg** Physiotherapy Pilot Project District Hospital, Durg Chhattisgarh
6.	**DDRC Raigarh** Chhote Atarmuda Near District Panchayat Bhavan Raigarh, Chhattisgarh
III. DRC Bhubaneshwar	
7.	**DDRC Samballpur** C/o Working Women's Hostel, Sambalpur Orissa
8.	**DDRC Mayurbhanj** (Campus of BDO Office) C/o BDO, Kalahandi Orissa
9.	**DDRC Kalahandi** (Campus of BDO Office) C/o BDO, Kalahandi Orissa
IV. DRC Chengalpattu	
10.	**DDRC Chengalpattu** District Rehabilitation Center GST Road Near Court Chengalpattu – 603 001(TN)
11.	**DDRC Vellore** Perumalsamy Building District Panchayat Board Office Complex Vellore

12.	**DDRC Port Blair**
13.	**DDRC Pondicherry** Mr. D. Balakrishnan District Rehabilitation Center GST Road, Near Court Chengalpattu – 603 001 (TN)
V. DRC Virar	
14.	**DDRC Latur** Jeevan Vikas Prathisthan, Signal Camp, Latur–12
15.	**DDRC Diu** Diu Garment Building, Fudam, District Diu
16.	**DDRC Silvassa** Dadra & Nagar Haveli, Opp. Bal Bhawan, Silvassa–30
VI. DRC Mysore	
17.	**DDRC Bellary** VIMS Campus, Old Book Bank Building, Bellary – 583 104
18.	**DDRC Belgaum** District Civil Hospital Campus, Near OPD Block, Belgaum – 590 001
19.	**DDRC Mangalore** 6th Cross, No. 24/5/568, Attavara, Behind KMC Hospital Dakshina Kannada District, Mangalore –1
20.	**DDRC Tunmkur** District General Hospital Campus Tunkur – 572 101
VII. DRC Sitapur	
21.	**DDRC Meerut** Shramjeevi Mahila Chhatravaas, Surajkund, Meerut
22.	**DDRC Agra** Saraswati Mangala Red Cross Hospital, Nangla Buddha, Agra
VIII. DDRC Jagdishpur	
23.	**DDRC Varanasi** Pandit Deen Dayal Upadhyay Hospital Campus Pandeypur–Varanasi (U P)
24.	**DDRC Gonda** Maharajganj District Gonda (UP)
25.	**DDRC Mau** Purana Sadan Hospital District Mau (UP)
26.	**DDRC Gorakhpur** Chhetriya Gram Vikas Sansthan Chargawa, District Gorakhpur (UP)

IX. DRC Bhiwani	
27.	**DDRC Bhiwani** General Hospital Bhiwani – 127 021
28.	**DDRC Sonepat** Bal Bhawan Building Sonepat, Haryana
29.	**DDRC Kurukshetra** Red Cross Building Kurukshetra, Haryana
30.	**DDRC Rohtak** Red Cross Building Rohtak
X. DRC Kota	
31.	**DDRC Ajmer**
32.	**DDRC Jodhpur**
33.	**DDRC Bikaner**
34.	**DDRC Jhunjhunu**

V. List of District Rehabilitation Centres

1. District Rehabilitation Centre,
Capital Hospital Campus, VI,
Bhubaneshwar – 751 001
ph: 0674-407803

2. District Rehabilitation,
Kharagpur General Hospital,
P.O. Kharagpur, Distt. Madnapore,
West Bengal – 721301
ph: 0322-62427/62894

3. District Rehabilitation Centre,
Lal Bagh (Near Raja College Field),
Shahjahanpur Road, Sitapur,
ph: 05862-3283

4. District Rehabilitation Centre,
Opposite Nurse Hostel,
Sardar Patel Hospital Campus,
Bilaspur – 495 001
ph: 07752-30893

5. District Rehabilitation Centre,
Ist Floor, Laundry Section,
Civil Hospital,
Bhiwani – 125 021
ph: 01664-3075

6. District Rehabilitation Centre,
Room No. 10, IIIrd Floor,
Vikas Bhavan, Sultanpur,
Uttar Pradesh – 227 809
Fax No. 0536-22317
ph: 0536-22317

7. District Rehabilitation Centre,
G.S.T. Road, Near Court,
Chengalpattu – 603 001
Madras
ph: 04114-6853

8. District Rehabilitation Centre,
Pulikeshi Raod,
Govt. School for Blind Children
Premises, Thilak Nagar,
Mysore – 570 021
ph: 0821-447670

9. District Rehabilitation Centre,
Kharodi Naka, Bolinj,
Agashi Road, Tal: Vasai,
Distt. Thane
ph: 0252-382735

10. District Rehabilitation Centre,
MBS Hospital Complex,
Kota – 324 001
ph: 0744-320891

11. District Rehabilitation Centre,
Opp. Prabodha Book Centre,
Gopal Reddy Road, Governor Pet
State Guest House Campus,
Vijayawada – 520 002
ph: 0866-579646

VI. List of the Addresses of the Special Employment Exchanges for Physically Handicapped (Running Under State/Union Territory Governments)

"Special Employment Exchange means any office or place established and maintained by the Government for the collection and furnishing of information, either by keeping of registers or otherwise, in respect of –

(i) Persons who seek to engage employees from amongst the persons suffering from disabilities;

(ii) Persons with disability who seek employment;

(iii) Vacancies to which person with disability seeking employment may be appointed."

S. No.	Name & Address of the Spl. Employment Exchanges
1.	The Regional Employment Officer, Special Employment Exchange for Physically Handicapped, Azamabad, Hyderabad – 500 020
2.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Barrack No. 1/B-5, Block A, Curzon Road, New Delhi – 110 001
3.	The Employment Officer, Special Employment Exchange for Physically Handicapped, No.5, Crescent Road, High Grounds, West Bangalore – 560 020
4.	The Special Employment Officer, Special Employment Exchange for Physically Handicapped, Merchantile Chambers, 3rd Floor, Graham Road, Ballard Estate, Mumbai – 400 001
5.	The Assistant Director, Special Employment Exchange for Physically Handicapped, 33, Mount Road, Nandanram, Chennai– 600 035
6.	The Special Employment Officer, Special Employment Exchange for Physically Handicapped, 5 Council House Street (Ground Floor), 620, D. H. Road, Kolkata – 700 001
7.	The Employment Officer, Special Employment Exchange for Physically Handicapped, G.T. Road, Kanpur – 208 002.
8.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Nadavanam Road, Palayam, Thiruvananthapuram, Kerala – 695 001
9.	The Employment Officer, Special Employment Exchange for Physically Handicapped, 985, Wright Town, Jabalpur – 482 001. (M P)
10.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Combined Labour Building, Bailey Road, Patna – 800 001, (Bihar)
11.	The Employment Officer, Special Employment Exchange for Physically Handicapped, 1282, Sector 18-C, Chandigarh – 160 018

S. No.	Name & Address of the Spl. Employment Exchanges
12.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Dte. Of Employment and Training (H P), Stock Palace, Shimla – 171 002
13.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Jaipur – 302 001 (Rajasthan)
14.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Dte. Of Employment, Flat No. 367, Sahid Nagar, Bhubaneshwar – 751 007 (Orissa)
15.	The Employment Officer, Special Employment Exchange for Physically Handicapped, Guwahati, Assam
16,	The Employment Officer, Special Employment Exchange for Physically Handicapped, Agartala, Tripura
17.	The Sub-Regional Employment Officer for Physically Handicapped, Kothi Building, Vadodara (Gujarat)
18.	The Sub-Regional Employment Officer for Physically Handicapped, Multi storey Building, Nanpura, Surat, Gujarat
19.	The Sub-Regional Employment Officer for Physically Handicapped, Kopasiwala Bungalow, Junction Plot, Rajkot, Gujarat
20.	The Special Employment Officer, Special Employment Exchange for Physically Handicapped, Salajose Cross Road, Opp. S V College, Ahmedabad – 380 001
21.	The Director, Special Employment Exchange for Physically Handicapped, Manipur, Imphal
22.	Special Employment Officer, Special Employment Exchange for Physically Handicapped, 1282, Sector 18-C, Chandigarh (Government of Punjab) –160 005
23.	The Director of Employment, Special Employment Exchange for Physically Handicapped, Vishakhapatnam (A P)

VII. List of Vocational Rehabilitation Centres for Handicapped, Directorate-General of Employment and Training, Ministry of Labour

VRC, Abhay Nagar, Agartala., Tripura – 799 005 Ph : 0381 - 22 5632	VRC. Napier Town., Near New Motor Stand & Nav Bharat Press, Jabalpur – 482 001 Ph: 0761-405581; Fax: 0761- 39 0169
VRC. ITI Campus Ahmedabad – 382 340 Ph: 079 - 281 1629; Fax: 079 - 282 2486	VRC., 45-A/23 Jawahar Nagar, Jaipur – 302 004 Ph: 041 - 65 2232; Fax 041- 200072
VRC., 22, Hosur Road Bangalore – 560 029 Ph: 080 - 656 4995	VRC, A T I campus, Govind Nagar, Kanpur - 208 022 Ph: 0512 – 29 6005; Fax:0512 - 29 6273
VRC, SIRD Campus, Unit VIII Bhubaneswar – 751 012 Ph: 0674 - 560 375 Fax: 0674 - 45 0800	VRC, A T I Campus, Near Aurora Talkies, Ludhiana – 141 003 Ph:0161- 490883 Fax: 0161-491871
VRC, 38, Badal Roy Lane Beliaghata Calcutta – 700 010 Ph: 033 - 350 8146 Fax; 033 –337 8358	VRC, A T I Campus, Sion, Mumbai – 400 022 Ph: 022–522 1707 Fax: 022-522 1560
VRC, C T I Campus, Guindy, Chennai – 600 032 Ph: 044 - 234 1534 Fax: 044 - 234 1211	VRC, ITI Hostel Bulding, Pusa, New Delhi –110 012 Ph: 011 - 578 8780
VRC, Old ITI Campus, Guwahati –781 008 Ph: 0361 - 54 3776	VRC, A/84, Plot 1, Gandhi Vihar, Police Colony, Anisabad Patna – 2 Ph: 0612 – 25 0213
VRC, A. T. I. Campus, Vidyanagar, Hyderabad – 500 007 Ph: 040 - 761 4381Fax: 040 - 761 4606	VRC, Nalanchira, Trivandrum – 695 015 Ph: 0471 - 531 175 - 530 371
Rural Rehabilitation Extension Centres attached to VRCs at Calcutta (Barasat, Uluberia), Chennai, (Trivellore, Chithamur) Kanpur, (Mohanlaganj, Gosaiganj, Akbarpur), Ludhiana (Hosiarpur, Bhatinda) and Mumbai (Bhiwandi, Dahanu) – Total 11	VRC for Women Mahavir Industrial Estate, Kareli Baug, Vadodara – 390 018 Ph: 0265 - 55 3674 Fax: 0265 - 43 0510/430362

VIII. List of Special Employment Exchanges and Special Cells for the Handicapped

SPECIAL EMPLOYMENT EXCHANGES	SPECIAL CELLS
ANDHRA PRADESH	
Hyderabad	Vishakhapatnam, Vijayawada
ASSAM	
Guwahati	
BIHAR	
Patna	Maraphari (Bokaro)
GUJARAT	
Ahmedabad, Baroda, Rajkot, Surat	
HARYANA	
Chandigarh	Mahendergarh, Sonepat
HIMACHAL PRADESH	
Shimla	Dharamsala
KARNATAKA	
Bangalore, Mysore, Hubli, Gulbarga	Tumkur
KERALA	
Trivandrum, Kozhikode, Kollam , Ernakulam	Palakkad, Neyyattinkara, Nedumangad, Kayamkulam, Aluva, Irinjalkuda
MADHYA PRADESH	
Jabalpur	Bilaspur, Durg, Dewas, Rewa
MAHARASHTRA	
Bombay	Nasik, Sholapur, Kolhapur
MANIPUR	
Imphal	
MEGHALAYA	
Shillong	
NAGALAND	
Kohima	
ORISSA	
Bhubaneswar	Cuttack
RAJASTHAN	
Jaipur, Ajmer, Alwar	Kota, Jhunjhunu, Sikar ,Sriganganagar
TAMIL NADU	
Madras	Combatore, Chinglepat, Cuddalore, Salem Tirunelveli, Vellore, Chidabaram (Thanjore) Peviyar (Erode), Uthagamandlam

TRIPURA	
Agartala	
PUNJAB	
Ludhiana	Amritsar
UTTAR PRADESH	
Kanpur, Gorakhpur, Aligarh, Allahabad, Agra, Varanasi, Bareilly, Lucknow, Mathura, Ghaziabad	
WEST BENGAL	
Calcutta	Barrackpore, Howrah, Purulia, Kharagpur
DELHI	
Curzon Road	

IX. List of Existing Functional RCS & Medical Rehabilitation Institutions run by ILEP

S. No.	Name of Institution	Address	State
1.	Emmaus Swiss Referral Hospital & Leprosy Project	L.S. Farm, P.O. - Palamaner – 517408, Chhittor District (ALES)	Andhra Pradesh
2.	Rural India Self Development Trust	Post Box 56, 20-63 Swaraj Nagar, A.C. Gardens, Kathipudi, Rajamundry– 533101 (ALES)	Andhra Pradesh
3.	Urban Leprosy Centre	Damien Foundation India Trust, Bkthavachala Nagar, A K Nagar Post, Nellore – 524004 (DFIT)	Andhra Pradesh
4.	Damien Leprosy Centre	Vegavara, Gopannapalem, Eluru Tk 534450, W G District (GLRA)	Andhra Pradesh
5.	Sivanand Rehabilitation Home	Kukatpally, Hyderabad – 500872 (GLRA)	Andhra Pradesh
6.	West Godavari District Leprosy Hospital	The Leprosy Mission, Narsapur, A P (TLM)	Andhra Pradesh
7.	Philadelphia Leprosy Hospital	The Leprosy Mission, Salur, Vizianagaram, District – 535591 (TLM)	Andhra Pradesh
8.	The Leprosy Mission Hospital	E. Godavari Distt, Ramachandrapuram– 533255, A P (TLM)	Andhra Pradesh
9.	The Leprosy Mission Hospital	P. O. Ramma, Muzaffarpur– 842002 Bihar (TLM)	Bihar
10.	Bethesda Leprosy Home and Hospital	The Leprosy Mission, P O Champa Janjgir District – 495671, Chhattisgarh (TLM)	Chhattisgarh
11.	Chandkhuri Leprosy Hospital and Home	The Leprosy Mission, PO – Baitalpur, Via- Hirri Mines, Bilaspur District – 495222, Chhattisgarh (TLM)	Chhattisgarh
12.	Hubli Hospital for Handicapped	Post Box No– 54, Anand Nagar Road, Hubli – 580020, Darwad District, Karnataka – 580020 (ALES)	Karnataka
13.	Sri Ramakrishna Sewa Ashram	Swami Vivekananda, Integrated Rural Health Centre, K R Extension, Tumkur, Pavagada, Karnataka – 561020 (DFIT)	Karnataka
14.	Belgaum Leprosy Hospital	The Leprosy Mission, Vengurla Road, Hindalga, Belgaum District – 591108, Karnataka (TLM)	Karnataka
15.	St. Joseph Leprosy Centre	Post Bag – 1, Sanawad – 451111, District Khargaon (LEPRA)	Madhya Pradesh
16.	Sishu Prem Samaj	101/C- Mountana Building, Road No.- 2, Lokandwala Complex, Andheri West, Mumbai – 400053 (GLRA)	Maharashtra
17.	Kothara Leprosy Hospital	The Leprosy Mission, P.O. Paratwada, Amravati District – 444805 (TLM)	Maharashtra

18.	Richardson Leprosy Hospital	The Leprosy Mission, Miraj, Sangli District – 416410, Maharashtra (TLM)	Maharashtra
19.	The Leprosy Mission Hospital	Poladpur Raigad District – 402303, Maharashtra (TLM)	Maharashtra
20.	HOINA Leprosy Research Trust	Post Bag–1, Muniguda, Rayagada District. – 765020 (LEPRA)	Maharashtra
21.	Schieffelin Leprosy Research & Training Centre	Karigiri – 632106, Vellore District, Tamilnadu	Tamil Nadu
22.	Sacred Heart Leprosy Centre	Karaikal Road, Sakkottai, Kumbakonam RS 612401, Tanjore District Tamilnadu (ALES)	Tamil Nadu
23.	Holy Family Hansenorium	Fathimanagar P. O. Tiruchirapalli District, Tamilnadu (DFIT)	Tamil Nadu
24.	Leprosy Relief Rural Centre	Chettipatty 636455, Via – Omalur, Salem District. (GLRA)	Tamil Nadu
25.	GREMALTES	5, Gajapathy Street, Shenoynagar, Chennai – 600030 (GLRA)	Tamil Nadu
26.	The Leprosy Mission Hospital	Vadathorasalur, P.O. Tiyagadurg, V.R.P. District – 606206, Tamil Nadu (TLM)	Tamil Nadu
27.	Dayapuram Leprosy Centre	The Leprosy Mission, Manamadurai, Sivagangai Dlstrict– 630606 Tamil Nadu (TLM)	Tamil Nadu
28.	Faizabad Leprosy Hospital	The Leprosy Mission, P.O. Motinagar, Faizabad Distt-224201, Uttar Pradesh (TLM)	Uttar Pradesh
29.	The Leprosy Mission Hospital	P.O. Naini, District Allahabad – 211008, Uttar Pradesh (TLM)	Uttar Pradesh
30.	Purulia Leprosy Home & Hospital	The Leprosy Mission, P.O. Box - 9, Purulia – 723101, West Bengal (TLM)	West Bengal
31.	Premanada Memorial Leprosy Hospital	The Leprosy Mission, 259 – A, A P Chandra Road, Kolkata – 700005 (TLM)	West Bengal
32.	The Leprosy Mission Hospital	The Leprosy Mission Hospital, Nandnagari, shadhara, Delhi – 110 093	Delhi

X. Names of Govermment Institutions performing Re-constructive Surgery (RCS) for persons affected by Leprosy

1. Patna Medical College, Bihar
2. Darbhanga Medical College, Bihar
3. Cuttak Medical College, Orissa
4. King George Medical College, Lucknow, Uttar Pradesh
5. Regional Institute of Medical Science Ranchi, Jharkhand
6. SSKM Hospital, Kolkata, West Bengal
7. Government Medical College Hospital, Bhopal, Madhya Pradesh
8. Berhampur Medical College, Orissa
9. Leprosy Home & Hospital Cuttack, Orissa
10. All Indian Institute of Physical Medicine Mumbai, Maharashtra
11. Central Leprosy Training & Research Institute, Chengalpattu
12. Regional Leprosy Training & Research Institute, Raipur
13. JALMA ICMR, Agra, Uttar Pradesh
14. R. G. Kar Medical College Hospital, Kolkata, West Bengal
15. N. R. S. Medical College, Kolkata, West Bengal
16. District Hospital Deharadun, Uttarakhand
17. Government Medical College, Chandigarh
18. General Hospital, Puducherry
19. Medical College, Dhule, Maharashtra
20. Medical College, Aurangabad, Maharashtra

Annexure XI

Guidelines for "Other-Cases" under NLEP

Directorate General of Health Services
National Leprosy Eradication Programme, New Delhi

"other-cases" under NLEP

As per the proposal placed by SLOs during SLO's conference held in New Delhi on 13th & 14th September 2007 and decisions taken in 3rd Programme Advisory Committee for NLEP meeting, held in New Delhi on 19th October 2007; following modification are to be made in record maintenance and reporting.

A new case is defined as person with signs of Leprosy who have never received treatment before.

Under NLEP all previously treated cases needing further treatment are recorded as **"other cases".** It has been decided that all migrant cases from another state reporting at any states Health Institution will also be grouped under this category.

Since other cases have already been included in calculation of prevalence rate, it should not be taken in to consideration again for calculating PR. But because they are still on treatment they must be recorded, category wise in a separate register.

Categorisation of other cases (recorded for PB and MB)

- **(a)** **Relapse** – Relapse is defined as the re-occurrence of the disease at any time after the completion of a full course of treatment. Diagnosis must be evidence based and must be diagnosed after adequate screening.
- **(b)** **Reentered for treatment –** These are previously treated cases, where clinical assessment shows requirement of further treatment and patient admits that treatment was not completed.
- **(c)** **Referred cases –** Patient referred for completion of treatment (remaining doses) by tertiary or second level institutions after diagnosis and issue of first dose, or from another Health centre on patient's request or migratory patient from another District/ State. All referred cases should have a referral slip showing diagnosis and remaining doses to be given.
- **(d)** **Change in classification –** Persons with PB Leprosy; reclassified to MB and need full course of MB treatment.
- **(e)** **Cases from outside the state and Temporary migration or cross border cases.**

This information will be separately shown in the monthly progress reports.

NOTE:

(i) Before deciding a case to be recorded as from other state, the residential status at the place of diagnosis be carefully examined. A person who is residing for more than

six month and is likely to stay till completion of treatment, be recorded as indigenous case and will not be categorized under "other cases".

(ii) It may be kept in view that some of the cases from another state will be "new cases". As such, the information has epidemiological significance for the state of origin.

Therefore, all PHCs/Hospitals have to prepare a list of cases recorded from other state showing Age, Sex, complete Address, Diagnosis (PB/MB) and Type (New case/old case). This list is to be sent by the Block PHC/Hospital to the district every month, who inturn will compile and send it to the state HQ. SLO has to compile the list for all districts and send to the concerned SLO from where the patient came, for their recording in the annual report of new cases detected, also marking a copy to the CLD. While PHCs are to send the list of "outside patient" to district and district to state along with the MPR every month; the state may send it subsequently to the submission of MPR to the CLD, but within the next month to which the report pertains.

(iii) It is the responsibility of the PHC/Hospital where the patient is recorded as "other cases" to provide complete treatment including use of A - MDT practice where needed.

The formats for recording and reporting the list of patients from outside the state is given in the next page.

Format for cross notification of Leprosy cases recorded and treated from outside the state

Name of PHC - **District -** **State -**
Report for the month :

S. No.	Age	Sex	Complete address	Diagnosis made PB/MB	Disability Gr. I/Gr.II	Type of case New/Restarted Treatment	Date of starting 1st dose	A-MDT provided (No. of MDT BCP given)	Remarks

Annexure XII

Guidelines on Quarterly Assessment of New Case Detection Rate (NCDR) under NLEP

Background

Annual New Case Detection Rate (ANCDR) is an important Indicator being used under the National Leprosy Eradication Programme. The indicator is calculated at the end of March every year, wherein New Cases detected during the period of last one year from 1st April (Previous Calendar year) to 31st March (current year) is used. Being annual the indicator was not much utilized to assess the epidemiological changes in the programme. Further till the year 2002-03, there was practically no reduction in the ANCDR in the country.

In view of the above, Prevalence Rate (PR) was utilized in the programme to measure achievements under NLEP. Further, special measures were taken every year on the basis of PR. Monthly availability of PR also helped in keeping active track on the disease epidemiologically.

With elimination of Leprosy at the National level and in most of the states and districts, time has come to put in higher emphasis on ANCDR while PR can also remain for few more years to show progress in elimination in the remaining states and districts.

Quarterly Assessment of NCDR

As indicated above, ANCDR is worked out under NLEP every year with March ending data. It is now proposed to work out NCDR quarterly as below:-

$$\textbf{1st Quarter – June'07} = \frac{\textbf{New cases detected during July'06 to June'07} \times 100{,}000}{\textbf{Population}}$$

$$\textbf{2nd Quarter – Sept.'07-} = \frac{\textbf{New cases detected during Oct.'06 to Sept.'07} \times 100{,}000}{\textbf{Population}}$$

$$\textbf{3rd Quarter – Dec.'07} = \frac{\textbf{New cases detected during Jan.'07 to Dec.'07} \times 100{,}000}{\textbf{Population}}$$

$$\textbf{4th Quarter – March'08} = \frac{\textbf{New cases detected during April'07 to March'08} \times 100{,}000}{\textbf{Population}}$$

Use of ANCDR under NLEP

(i) This quarterly assessment of NCDR at National / State / District / Block level will help in better understanding of the Leprosy status in different areas, on which action can be initiated in time.

(ii) Under the SIS Guidelines (2002), a quarterly performance assessment format (LF-06) was introduced for use of District and State level. The format is to be modified as MLF-06, in which Quarterly NCDR is to be included for assessment and action. The MLF-06 is given in the page no 192.

(iii) Both the actual number of new cases detected during the year and ANCDR are important for analysis of the Leprosy situation.

ML.F - 06

Quarterly Performance Assessment

District - _____ State - _____

Quarter - _____ Year - _____

S. No.	Block/District	Female (%)	New Visible Deformity (%)	SC/ST Rate		New cases *(NCDR/ 100,000)	Sub-Centre involvement (%)	Patient Month BCP.Stock				Corrective Action Taken
				SC	ST			MB(A)	MB(C)	PB(A)	PB(C)	
1												
2												
3												
4												
5												

* Quarterly NCDR to be put within Bracket

Annexure XIII

Revised Guidelines for Streamlining the MDT Supply Management in States/UTs

1. Background

1.1 A regular flow of information to and from Central/State/District/Block PHC/PHC levels is essential if the programme is to be successful. All requests for MDT drugs should be carefully checked to see if the quantities requested are realistic, based on the current caseload for the area.

1.2 SLO & DLO need to be fully familiar with the various distribution practices of individual medical officers and therefore be able to interpret these apparent discrepancies. However, if the average dispatches to a particular area are significantly over or under those required for the current caseload, then the SLOs/DLOs should investigate, if necessary by conducting a field visit. Any excess stock of MDT been found should be redistributed to needy areas and shortage of BCPs should be replaced.

1.3 One important role of effective drug supply management is to use old stocks before new stocks. All blister packs carry the date of expiry stamped on the edge of the pack which is three years from the date of manufacture, and those stocks with the earliest expiry date should always be used first. Note that different suppliers may print or stamps their expiry dates in a different position on the blisters. The rotation of stocks is important in the GMSD, and in the field stores where storage conditions may be less than ideal.

1.4 The stock levels to be maintained in the state/UT should be minimum two months to maximum of six months. The average stock of MDT at each level of PHC, district and state should be round about two months. No drug need to be stocked at sub-centre level.

1.5 **No drug of particular category should be kept at PHC where no case of Leprosy of that category is under treatment during the last six months.**

1.6 If there was a case of Leprosy which is released from treatment within last six months, then keep one blister pack of that specific category at PHC and return the balance stock of drug of that category to the district store immediately.

1.7 The request for MDT supply from state to central Leprosy division on quarterly basis and request from PHC to district and from district to state on monthly basis should be made, so that adequate stock of 2–6 months of MDT drugs is maintained.

2. Assessing, availability & indenting MDT drugs

2.1 For assessing & indenting MDT drugs by SLO, DLO, Block PHCMO, Sector PHC MOs specified format given below should be used as appropriate.

At sector PHC level (collecting MDT stock directly from District Head Quarter Store)

S.No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	No. of cases under treated at the PHC.				
2.	Stock of MDT BCP available at PHC.				
3.	Availability of MDT BCPs- in patient's month at PHC (Sl. 2÷1).				
4.	Total MDT BCPs requirement to maintain two months stock at PHC (Sl.1X2 months).				
5.	Net requirement of MDT drug as on date (Sl 4-2).				
6.	Quantity of MDT drugs stock expiring in next 2 months.				

At Block PHC (keeping stock for sector PHC also)

S.No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	No. of cases under treatment as on date (Block + Sector PHCs).				
2.	Stock of MDT BCPs available at Sector PHC.				
3.	Stock of MDT BCPs available at Block PHC.				
4.	Total MDT Drugs available in Block PHC+ Sector PHCs (Sl. 2+3).				
5.	Availability of MDT BCPs stock in patient's month in the Block PHC+ Sector PHCs(4÷1).				
6.	Total MDT BCPs required to maintain two months stock at Block PHC including Sector PHCs (Sl. 1 X 2months).				
7.	Net requirement of MDT drugs as on date (Sl. No. 6–4).				
8.	Quantity of MDT drugs stock expiring in next 2 months.				

At District Level (Revised on 1st December 2006)

S.No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	No. of cases under treatment as on date.				
2.	Stock of MDT BCPs available at Block PHC+ PHCs level.				
3.	Stock of MDT BCPs available at District level H.Qtr. Store.				
4.	Total MDT drugs available in the district including stock at block PHC+ PHCs.				
5.	Availability of MDT BCPs stock in patient's month in the district (4÷1).				
6.	Total MDT BCPs required to maintain four months (2 months for District & two months for PHCs) stock at District Level (Sl. 1 X 4 months).				
7.	Net requirement of MDT drugs as on date (Sl.. 6-4)				
8.	Quantity of MDT drugs stock expiring in next 6 months				

At State Level

S. No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	Number of cases under treatment as on date.				
2.	Stock of MDT BCPs available at Block PHC + PHCs level.				
3.	Stock of MDT BCPs available at district stores.				
4.	Stock of MDT BCPs available at state stores.				
5.	Total MDT drugs available in PHCs/ district/ state level (sl 2+3+4).				
6.	Availability of MDT BCPs stock in patient's month in the state level (Sl. 5÷1).				
7.	Total MDT BCPs required to maintain 6 months stock at state Level (Sl. 1 X 6 months).				
8.	Net requirement of MDT drugs as on date (Sl. No. 7–5).				
9.	Quantity of MDT drugs stock expiring in next 1 year.				

2.2 **States/UTS.** may have to keep provision for drugs particularly MB (A) and PB (A) for issuing to patients under Accompanied MDT (A-MDT). Such request based on past experiences may be sent in a separate sheet along with the quantity in Indent to CLD for consideration.

3. Reporting on stock of MDT Drug

3.1 **At PHC and District level –** Monthly Reporting Form –L.F. 04 should be properly filled up by the Primary Health Centre. This simple form will be filled up from the data available in the drug stock record maintained at the PHC. The relevant column from MLF-04 for reporting MDT drug stock at the end of the reporting month are as below:

Blister pack	Quantity	Expiry date	Total stock
MB (A)			
MB (C)			
PB (A)			
PB (C)			

3.2 **At state level –** Monthly Reporting Form – L. F. 05 should be filled up by the State level where compiled information received from all the Districts will be entered. Relevant column from LF 05 for reporting MDT Drug Stock at the end of the reporting month (If required use extra sheets) are as below:

Blister packs	Compiled district stock		State store stock		Total in the state
	Quantity	Expiry date	Quantity	Expiry date	
MB (A)					
MB (C)					
PB (A)					
PB (C)					

4. Destruction of expired MDT drugs

4.1 MDT drugs are being supplied by WHO since 1995 free of cost to India. In this regard, WHO has authorized vide letter No. LEP/135/2 dated 14.05.2002 to arrange for the destroying the expired blister packs of MDT drugs, subject to the following information to be collected and collated prior to the destruction of drugs as conveyed vide DGHS letter No. M.11014/11/2001-Lep. Dated 28.08.2002

i) Collect the expired MDT blister packs and destroy by adopting the standard procedures prescribed by the Central and State Govt. levels as per stores manuals.

ii) Collect and collate the information on – a) Quantities and type of blister pack of MDT being destroyed (i.e. MB(A), MB(C), PB(A), PB(C) & ROM; b) Batch No. and expiry dates of the blister packs being destroyed, and c) Name of the GMSD and/or state store at which the blister packs became expired.

iii) The drugs should be totally destroyed by burning so that they cannot be consumed later either by humans or by animals.

iv) Necessary entry should be made in the stock registers and balances must be updated.

4.2 A detailed report to this fact should be prepared providing information on the names of the GMSDs and/or stare stores at which the blister packs expired, procedures followed for destroying these expired drugs, quantities and type of blister being destroyed, batch number and expiry dates of the blister packs being destroyed. The report should be furnished to Central Leprosy Division (CLD) within two weeks of this activity.

5. Certificate of receipt of MDT drug

Each State Programme Officer is required to furnish a certificate indicating that MDT drugs supplied by GMSD____X____vide invoice No. _____XYZ_____ dated _____ABC_____has been received in good condition. This is required for accounting the cost of drugs at CLD. The below given format may be used for this purpose.

CERTIFICATE

This is to certify that the following Anti Leprosy Drugs have been received in good condition/ damaged condition as indicated in the remarks column from GMSD……..

S.No.	Particular	Release Order Number and Date (quantity BCPs)	Actual Quantity-BCPs received from GMSD	Invoice Number	Date of Receipt	Remarks
1.	MB (A)					
2.	MB (C)					
3.	PB (A)					
4.	PB (C)					

Signature/Name/Designation/State

Dated:

The MDT Indent from the State to Central Leprosy Division is submitted every three months

At State Level

S.No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	No. of cases under treatment as on date.				
2.	Stock of MDT BCPs available at Block PHC + PHCs level.				
3.	Stock of MDT BCPs available at District Stores.				
4.	Stock of MDT BCPs available at State Stores.				
5.	Total MDT Drugs available in PHCs/District/ State level (Sl 2+3+4).				
6.	Availability of MDT BCPs stock in patient's month in the State level (Sl. 5÷1).				
7.	Total MDT BCPs required to maintain 6 months stock at State Level (Sl. 1 X 6 months).				
8.	Net requirement of MDT Drugs as on date (Sl. No. 7–5).				
9.	Quantity of MDT Drugs stock expiring in next 1 year.				

Assessing & indenting MDT drugs

S.No	Particulars	MB(A)	MB(C)	PB(A)	PB(C)
1.	No. of cases under treatment at the Institute.				
2.	Stock of MDT BCPs available at Institute.				
3.	Availability of MDT BCPs- in patient's month at Institute (Sl. 2÷1).				
4.	Total MDT BCPs requirement to maintain 6 months stock at Institute (Sl.1× 6 months).				
5.	Net requirement of MDT drug as on date (Sl 4-2).				
6.	Quantity of MDT drugs stock expiring in next 6 months.				

Annexure XIV

Guidelines for use of "Treatment Completion Rate" as an Indicator under NLEP

Background

The Operational Guidelines on "Global Strategy for further reducing the Leprosy burden and sustaining Leprosy control activities (2006–2010)" had mentioned that "The proportion of patients who complete their treatment on time as a proxy for cure rate" is one of the main indicators for use for monitoring the epidemiological trends of Leprosy.

The proportion of new patients who complete their treatment on time is an indication of how well the Leprosy patients are being served by the health services. The rate is calculated separately for PB and MB patients, by what is known as a "cohort analysis".

Under the National Leprosy Eradication Programme the cure rate for PB and MB cases was earlier determined during the year 2002, 2003 and 2004 in selected districts/States alongwith Leprosy Elimination Monitoring (LEM) studies. It is now decided to determine this Indicator on a regular basis, every year, all over the country, as an inbuilt component of the programme. Procedures to be adopted, records to be maintained and reports to be furnished are indicated in this guideline.

I. Revised Indicator

Treatment Completion Rate (TCR) are ascertained for:

(a) PB and MB cases treated.

(b) PB Male/Female and MB Male/Female cases treated.

(c) Rural/Urban areas.

II. Cohort Analysis

(a) A cohort is simply a group of patient who all start treatment in the same batch, usually in the same year. Selection of the group of patient in a particular year is important. The reporting year is the year during which the last case under treatment in the related cohort group completes the treatment.

For the reporting year 2006-07, selection of patient should be as below:

PB – All new cases detected and started treatment during the year 2005-06 (April 2005 till March 2006).

MB – All new cases detected and started treatment during the year 2004-05 (April 2004 till March 2005).

This time gap is necessary so that the last patient detected in a particular year, gets nine months for PB and 18 months for MB patients to complete their treatment.

(b) The PB treatment completion rate is calculated as follows.

$$\frac{\text{Number of New PB cases who completed MDT within 9 months} \times 100}{\text{Number of New PB cases who started MDT in the year}}$$

(c) The MB treatment completion rate is calculated as follows.

$$\frac{\text{Number of New MB cases who Completed MDT within 18 months} \times 100}{\text{Number of New MB cases who started MDT in the year}}$$

(d) Calculation on similar lines will be done for Male/Female and Rural/urban area cases separately.

III. Methodology

(a) The indicator **"Treatment Completion Rate"** is to be worked out routinely every year during the period May–June. For the current year (2007-08), the exercise may be carried out after the guideline is issued.

(b) All the districts will be covered and the exercise will be carried out by the District Nucleus staff who will be given specific orientation for this purpose initially and every year on need basis.

(c) The District Nucleus will collect the Treatment Registers (LF-02) from all reporting centres for the concerned year of treatment for PB and MB cases. The works will be carried out in the District HQ office.

(d) Steps to be followed

Step – I

(i) In the register locate the new cases starting treatment in the year and mark with serial Numbers starting from 1. Male and Female groups may be given separate identification like – Male: 1m, 2m and Female: 1f, 2f etc. At the end of the year a summary to be drawn up, showing total in male group and female group separately, adding which will give the total cases of the type of the disease, that started treatment during the year.

(ii) Registers for PB and MB group will be for different year. However it is advisable that different coloured Pen/Pencil may be used while putting the serial numbers for each of PB/MB and Male/Female groups.

Step – II

After the numbering is complete, the details of the patient are to be entered in the computation form given as **cohort I (PB)** and **cohort II (MB).** Separate format be used for each reporting centre and for Rural and Urban areas.

Step – III

Data from each reporting unit will thereafter be transferred to the **District Compilation sheet I (PB) and sheet II (MB).**

Treatment completion rate will be worked out for Rural and Urban areas for PB/MB cases and Male/Female cases and recorded in the District compilation sheet.

Step – IV

The District will prepare the report in form NLEP/TCR-I giving Treatment Completion Rate for the reporting year with particulars on PB/MB, Male/Female and rural/urban data. The report will be sent to the SLO.

The Registers collected from the reporting centres will be returned to the concerned centre. All the compilation forms (PB & MB) along with the District Compilation sheets and copies of the report sent to the State office will be preserved in a file at the District Leprosy Office for further reference.

Step – V

The State Office will similarly compile the district wise information in **State compilation Sheet I (PB) and Sheet II (MB).**

Step – VI

The State Leprosy Office will prepare the state report in form **NLEP/TCR II** and send the same to the Central Leprosy Division by July each year.

The state will preserve the district reports received, state compilation sheets prepared and copies of the report sent to the CLD in a file for future reference.

IV. Budget

The exercise will be carried out at the District Head Quarter and does not involve any separate movement of staff. Funds required for printing of forms etc. may be utilized from the printing cost available under the programme.

Computation Form: Cohort-I (PB)

Name of Health Centre:
District : **Area: Rural/Urban:**
Cohort period-1st April 2006 to 31st March 2006

S. No.	Age	Sex	Starting Date of 1st dose	Subsequent months (Pulses)									Remarks
			1	2	3	4	5	6	7	8	9	10	
1.													
2.													
3.													
4.													

- **Remarks: R. F. T. = Treatment Completed with 9 months and released from treatment**
  D. D. = Deleted as Defaulter

Summary:

Total cases put under treatment = Male-A Female-X

Total cases made RFT = Male-B Female-Y

Treatment completion rate = PB (Male) $\frac{B}{A}$ x 100 = % = PB (Female) $\frac{x}{y}$ Yx100 = %

Computation Form: Cohort-II (MB)

Name of Health Centre:
District: **Area: Rural/Urban**
Cohort period- 1st April 2004 to 31st March 2005

S. No.	Age	Sex	Starting Date of 1st dose	Subsequent months (Pulses)																	Remarks
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1.																						
2.																						
3.																						
4.																						

- **Remarks: R. F. T. =Treatment Completed within 18 months and released from treatment**
  D. D. = Deleted as Defaulter
  Summary:
  A = Total male cases put under treatment
  B = Total male cases made RFT
  Treatment completion rate (TCR) in male cases = B/A × 100

  X = Total female cases put under treatment
  Y = Total female cases made RFT
  Treatment completion rate (TCR) in female cases = Y/X × 100

Annexure XV

Formats for Recording and Reporting

1. Guidelines to fill up the Patient Card

This card will be maintained at sub centre, where the MPW will enter dates of subsequent monthly dose collection by patient, till the last dose required and then discharge the patient on the due date of discharge and record accordingly. After every monthly dose supplied and achieving end status, the MPW will also ensure updating the Treatment Register at the PHC, on their next visit for any purpose.

Cell	Information to be filled
Registration No.	Running number for the fiscal year at PHC level starts as 001 on first day of the month of April.
Name	Full name.
Address	Full postal address and identification marks near the house to facilitate tracing of defaulter.
Duration of Disease	To be ascertained from case history to be written in months
Age	In number of completed years.
PB & MB	PB – 1 to 5 patches and/or 1 nerve affected . MB – 6 and more patches and/or 2 more nerve affected.
Visible deformity	Write Gr 1, for grade one disability, if there is only loss of sensation and Gr 2 for visible deformity.
New Case	(Tick) A new case is defined as person with signs of Leprosy who have never received treatment before.
Other Type	Under NLEP all previously treated cases needing further treatment are recorded as **"other cases"**. It has been decided that all migrant cases from another state reporting at any state, health institution will also be grouped under this category. Specify the category like re-entry, transferred in, referred, change in classification or relapse.
Date of first dose	Write date as day/month/year of giving first blister pack of MDT, client swallows medicine in the presence of health worker/pharmacist.
Date of subsequent doses	Write date of collection of the subsequent dose as it will help in following the person who has not come to collect medicine. Do not tick. In case person has taken accompanied MDT write the date in the first cell and connect that cell with the other cells (number of cells corresponding to the number of extra blister packs taken) by a line with arrow mark in the end.
Date of discharge	Write date of completion of last blister pack as day/month/year of discharge.
Refer to	Write date of referral, place of referral and reason for referral.

End Status	Tick/write RFT – Released from treatment if person with PB Leprosy has taken 6 blister packs in 9 months and that with MB Leprosy 12 blister packs in 18 months. Tick Others: if person has not completed the treatment and write defaulter, died, migrated or unknown depending on the status.
Back of the card	You may write the details for reference in subsequent visits.

After achieving the End Status, the MPW should put her/his signature on the patient card and retain the same at sub centre for future reference.

In urban situation also the same card is used. However appropriate Health unit, Area and Region may be indicated in the place of sub centre/PHC/Block.

NATIONAL Leprosy ERADICATION PROGRAMME (NELP) PATIENT CARD										
Sub centre				PHC						
Block/CHC			Districts				State			
Registration Number:							SC	ST	Others	
Name							Age	Female	Male	
Address					**Duration of the disease**					
Classification		PB	MB	New Case	Other Type (Specify)					
Visible Deformity		Yes	No	Remarks						
Date of First Dose										
AFTER ENTERING ABOVE INFORMATION IN THE PHC TREATMENT RECORD, THIS PATIENT CARD IS TO BE TRANSFERRED TO SUB CENTRE FOR DELIVERY OF SUBSEQUENT DOSES					Signature of Medical Officer					
Date of subsequent doses:										
2	3	4	5	6 PB (Final)	7	8	9	10	11	12
Date of discharge										
End Status			RFT		Others (specify)					
THIS CARD IS TO BE MAINTAINED AT SUB CENRE. AFTER EVERY DOSE, UPDATE THE PHC TREATMENT RECORD. AFTER ACHIEVING END STATUS, THE MPW SHOULD SIGN THIS CARD AND RETAIN AT SUB CENTRE FOR FUTURE REFERENE					Signature of Sub centre MPW					

Guidelines to fill-up this card	
Registration Number	Running number for the fiscal year at PHC level
Classification	PB- 1 to 5 patches and/or 1 nerve affected MB – 6 and more patches and/or 2 or more nerve affected
New Case	A Leprosy patient who has not taken MDT drugs anywhere earlier
Other Type	Includes Immigrant, Relapse, Referral or Restart of treatment
End Status	RFT – Released From Treatment
	OTHERS – DEFAULTER (Case of PB or MB consecutively absent for a period of 12 months from the last dose)/DIED/MIGRATED/ UNKNOWN
*In Urban situation, this same card I to be used. However, appropriate Health Unit, Area and Region may be Indicated in the place of Sub centre/PHC/Block.	

Note: **Categorization of other cases (recorded for PB and MB)**

(a) **Relapse –** Relapse is defined as the re-occurrence of the disease at any time after the completion of a full course of treatment. Diagnosis must be evidence based and must be diagnosed after adequate screening.

(b) **Reentered for treatment -** These are previously treated cases, where clinical assessment shows requirement of further treatment and patient admits that treatment was not completed.

(c) **Referred cases –** patient referred for completion of treatment (remaining doses) by tertiary or second level institutions after diagnosis and issue of first dose, or from another Health centre on patients request or migratory patient from another District/State. All referred cases should have a referral slip showing diagnosis and remaining doses to be given.

(d) **Change in classification –** persons with PB Leprosy; reclassified to MB and need full course of MB treatment.

(e) **Cases from outside the state and temporary migration or cross border cases.**

This information will be recorded in a separate register (LF-02/A) and reported separately in the monthly progress reports.

Before deciding a case to be recorded as from other state, the residential status at the place of diagnosis be carefully examined. *A person who is residing for more than six month and is likely to stay till completion of treatment, be recorded as indigenous case and will not be categorized under "other cases".*

2. Treatment Record

The Treatment Record (L.F. 02) should be kept in a register in all Primary Health Centres/Block PHC/CHC wherever Leprosy cases are diagnosed and treated. As discussed earlier, at first the patient card is prepared by the Medical Officer diagnosing the case of Leprosy. The information will thereafter be filled up in the Treatment Record. The Annual Serial Registration Number will also be available from this Register. The Medical Officer I/C of PHC/CHC etc. can give this responsibility to one of the General Health Care Staff working in the Health Centre. The information entered should be exactly similar to the one recorded in the patient card.

The person(s) entrusted with responsibility of filling up the Treatment Record, should also ensure updating of the records of all patients being treated at sub centres on receipt of factual information from the concerned MPW(s). Any default on receipt of information should be promptly brought to the notice of the Medical Officer in-charge who will ensure updating of the record.

The same L.F. 02 form is also to be used in all Hospitals, NGO institutions engaged in diagnosing and treating Leprosy cases. The name of PHC/Block PHC/CHC should be replaced by name of hospital/NGO Institution.

The Registration Number will be changed every year starting from 001 on 1st April of the Fiscal year (say 1st April 2002 to 31st March 2003).

The treatment record will be retained in the Health Centre/Hospital/NGO institutions for future reference.

LF -02

NATIONAL Leprosy ERADICATION PROGRAMME (NLEP) – PHC TREATMENT RECORD

PHC _____ Block PHC/ CHC

_____

DISTRICT **State** **Fiscal Year**

Reg No.	Sub Centre	New/ Others	Name	Address	Age	Sex M/F	SC/ ST	PB/ MB	Visible Defor. Y/N	Date of first dose	Date of Subsequent Doses											Date of RFT	Remarks
											2	3	4	5	6 PB (final)	7	8	9	10	11	12		

LF -02/A

Register for Recording "other cases"

Name of PHC _____ **District** _____ **State** _____

S. No.	Age	Sex	Complete address to which the patient belongs (must record village/Block/Distt/State)	Diagnosis (PB/MB)	Type of case				
					Relapse	Partial treated old cases Rentered for treatment	Referred cases	Change in classification to PB/MB	Patient belong to State/UT of

LF-02/A Contd.

Register for Recording "other cases"

Disablity status Gr.I/Gr.II	Treatment record with date												Date of RFT	Remarks
	1	2	3	4	5	6	7	8	9	10	11	12		

3. Leprosy MDT Drug Stock Record

The MDT Drug Stock Record (L. F. 03) is to be maintained in all PHC/Block PHC/CHC where MDT is supplied from the district and stocked. This is to be maintained in a Register. Separate pages should be used for each of the 4 types of MDT Blister Packs supplied viz. MB (Adult), MB (Child), PB (Adult), PB (Child).

Guidelines to fill up the form

Transaction Date	Date on which the drug is received or issued (Expenditure).
Quantity received/issued	Number of Blister Calendar Packs (BCP) received or issued
From where	Source of receipt say – DLO Ghaziabad or Block PHC – Madhubani
Vide Reference No.	No. & date of order under which the drug has been supplied/ issued.
Batch No.	As recorded in the BCP cover/packing box
Expiry Date	As recorded in the BCP cover/packing box
To whom	Indicate to whom issued say Mornoi sub centre
Balance in hand	Enter quantity as should be available as per record (must enter on each transaction date).
Remarks	Record any receipt in damaged condition, shortage in receipt against Ref. No., discoloration appearing at any time etc. giving quantity and indicating action taken.

Similar form (L.F. 03) is to be used at district and state level drug stores also. Hospitals in urban situations and NGO Institutions should also keep similar records.

Drug stock records are important document and should not be changed annually. Same register can be used for number of years. The record will be retained in the Health centre/Hospital/NGO Institute/District/State for future reference and audit.

L. F. 03

NLEP – Leprosy MDT DRUG STOCK RECORD

Use separate page for each category of MDT [MB(A)/ MB(C)/ PB(A)/ PB(C)] – Specify category :

_____

(Same format to be used at PHC/District/State levels – Please specify level with name along with next highest level up to State)

PHC _____ **Block PHC/ CHC** _____

District _____ **State** _____ **Fiscal Year** _____

Receipt_____					**Expenditure** _____							
Transaction Date	**Quantity. Received**	**From Where**	**Vide Ref. No.**	**Batch No.**	**Expiry Date**	**Quantity Issued**	**Vide Ref. No**	**To whom**	**Batch No.**	**Expiry date**	**Balance In Hand**	**Remarks**

4. Reports

The data recorded in various centres need to be periodically collected and put in a pre designed format for sending to the next higher level for further use. These are called the reporting formats.

The Simplified Information System under NLEP has accepted the following two reporting formats –

ML.F. 04 – NLEP monthly reporting form – PHC/Block PHC report

4.1 NLEP – Monthly reporting form - PHC

The ML.F. 04 form will be utilized by the Primary Health Centre, which is the basic recording unit under NLEP. This simple form will be filed up from the data available in the Treatment record and the Drug Stock record maintained at the PHC.

4.1.1 Guideline for filling the form

Put name of PHC/Block PHC/District/State/reporting month and Fiscal year at the top.

S. No. 1 – No. of cases at the beginning of the reporting month i.e. S.No. 5 of previous month's report.

S. No. 2 – Total New Leprosy cases detected in the reporting month (Adult & child) – Put PB and MB cases in space provided in 1st column and put total in white space provided in right hand column.

S. No. 3 – Among the new Leprosy cases detected, number of – Put specific number in the 1st column provided.

S. No. 4 – Number of cases deleted in the reporting month –

- RFT – Number, released from treatment after completion of all doses of MDT.
- Others – Deleted from record due to Death/Migration/absent for more than three months (PB)/six months (MB)/unknown reason.
- Put total in the blank space given in right hand column.

S. No. 5 – Number of cases at the end of the reporting month – Put figure arrived at by adding total in S. No. 1 and S. No. 2 and then subtracting total in S.No. 4.

S. No. 6 – No: of other cases recorded and put under treatment. Relapse, re-entry, transferred in, referred, change in classification or migrated from other states.

S. No. 7 – Number of other cases deleted due to completion of treatment or due to other reasons like migration/transfer out/death etc.

S. No. 8 – Total number of other cases; PB, MB & Total; under treatment (6–7)

S. No. 9 – Leprosy drug stock at the end of the reporting month Put balance quantity of each drug a per record on the last date of transaction, Specify expiry date along with the quantity with that expiry date, calculate number of BCPs available for each patient under treatment.

Remarks: Any important information to be included regarding drug shortage.

The report is to be signed by the Medical Officer In-charge of the PHC. The same form should be used by Hospitals/NGO Institutions also.

NLEP Monthly Reporting Form
PHC/Block PHC Report

M. L. F. 04/A [Page 1]

PHC _____ **Block** _____

District _____ **State** _____

Reporting Month _____ **Year** _____

1.	**No. of balance new cases at the beginning of the month**	PB				
		MB				
		TOTAL				
2.	**No. of New Leprosy Cases detected in the reporting month**			During reporting month		
				PB	MB	TOTAL
		Adult				
		Child				
		Total				
3.	**Among new Leprosy cases detected during the reporting month, number of**	Female				
		Deformity	Grade-I			
			Grade-II			
		SC				
		ST				
4.	**Number of New Leprosy cases deleted during the month**	RFT -				
		Otherwise deleted				
		Total				
5.	**Number of New Leprosy cases under treatment at the end of the month (1+2-4)**					
6.	**Number of "other cases" recorded and put under treatment**	(i) Relapsed (ii) Reentered for treatment				
		(iii) Referred				
		(iv) Reclassified				
		(v) From other states				
		Total				
7.	**Number of 'other cases' deleted from treatment**	RFT				
		Otherwise deleted				
		Total				
8.	**Number of other cases under treatment at the end of reporting month**					

9. Leprosy Drug Stock at the end of the reporting month (if required use extra sheets) :

Blister Pack	Quantity	Expiry Date	Total stock	No. of patients under treatment	Patient month BCP
MB (C)					
PB (C)					

M. L. F. 04/A [Page 2]

S. No	DPMR activities	During reporting month		
		PB	MB	Total
1.	No. of reaction cases recorded			
2.	No. of reaction cases managed at PHC			
3.	No.of reaction cases referred to district hosp./other instt.			
4.	No. of suspected relapse cases and referred by PHCs			
5.	No. of relapse confirmed at District Hospital			
6.	No. of cases developed new disability after MDT			
7.	No. of patients provided with footwear			
8.	No. of patients provided with self care kit			
9.	No. of patients referred for RCS at tertiary instt.			
10.	No. of instt, providing RCS			
11.	No. of cases referred for skin smear			
12.	No. found +ve for AFB			

Date : **Name and Signature of the Medical Officer**

Form - PI

Disability Register

PHC / primary care unit _____ **District** _____ **State** _____

S.No	Name of the patient	Age/ Sex	Postal address	Date of Registration	Type of Leprosy	Treatment (MDT) status (No. of BCP taken)	Disability Grade
Column No.							
1	2	3	4	5	6	7	8
1							
2							

Hands					Feet					Eye			Services provided with date		Change /progress noticed		Referred to with date
Column No.																	
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Anaesthesia palm	Claw hand	Ulcer	Absorption of finger	Any other disability	Anaesthesia sole	Foot drop	Ulcer – Foot	Absorption of toes	Other disabilities (Foot)	Lagophthalmos	Low Vision	Red Eye	Date	Services	Date	Changes	

5. How to fill up the Form P-I

Column 1:	Serial no. to disabled cases is to be given.
Column 2:	Complete name with surname along with son/daughter/wife of should be written.
Column 3:	If patient is unable to tell the age, age should be assessed.
Column 4:	Complete postal address with landmark/ PIN to be given.
Column 5:	Date of registration for MDT is to be written.
Column 6:	PB or MB is to be written.
Column 7:	Total number of BCP, MDT should be written.
Column 9 to 21:	Tick mark on disability detected, more than 1 disability may be there.
Column 22–23:	Services such as self care training, ulcer care, surgery, issuing MCR shoes, refer to secondary level etc. may be entered along with respective dates.
Column 24–25:	Changes like ulcer healed, ulcer recurred, contractual developed, vision deteriorated new nerve damaged noticed etc.

Assessment of Disability & Nerve Function

A. Particulars of Individuals

Name	Dt. of Regn	Dt. of RFT
Sex/Age	MB/PB	Sub Centre
S/o, D/o, W/o	MDT No.	Occupation
Address		

B. Sensory Testing

DATE / ASSESSOR	Palm		Sole		Comments
	RIGHT	LEFT	RIGHT	LEFT	

Key : (Put these mark/icon on the site where lesion is seen)

√ Sensation Present within 3cm
x Anaesthesia
Λ Clawing
S Contracture
Wound
Crack
Scar/Callus
Shortening Level

C. Voluntary Muscle Testing (VMT)

RIGHT							LEFT					
						← Date →						
						Vision (0,1,2)						
						Light Closure lid gap in mm.						
						Blink Present/Absent						
						Little Finger Out						
						Thumb Up						
						Wrist Extension						
						Foot Up						
						Disability Grade Hands						
						Disability Grade Feet						
						Disability Grade Eyes						

On date						
Max. (WHO) Disability Grade						
EHF score						
Signature of Assessor						

Muscle power:
S = Strong
W = Weak
P = Paralysis

Score of vision: counting fingers at 6 metres
0 = Normal
1 = Blurring vision
2 = Unable to count fingers

D. Disability grading

Date						
Max. (WHO) Disability Grade						
EHF score						
Signature of Assessor						

This form should be filled-in at the time of registration and repeated after three months (once in two weeks in case of neuritis/reaction).

Form – P III

Record of Lepra Reaction/Neuritis (LRN) cases

PHC/district _____

Col. No.1	Col. No. 2	Col. No.3	Col. No. 4	Col. No. 5		Col. No. 6			
S. No.	Name of the patient	Date of registration	MDT No. / registration No.	Type of Leprosy		Lepra Reaction			
				MB	PB	Type I	Type II	Neuritis Y	Neuritis N

Col. No.7						Col. Col. No.8	Col. No.9		Col. No.10
Treatment given							New disability developed After start of prednisolone		Remarks
Prednisolone doses issued with dates						Other drugs	Yes	No	

How to fill up the Form I

Column 1: Serial no. of reaction cases is to be given.

Column 2: Complete name with surname along with son/daughter/wife of should be written.

Column 3: Date of registration of MDT is to be written.

Column 7: Doses of Prednisolone in milligram with date of issue to be filled.

Column 8: Enter Clofazimine, Analgesics, Mebendazole, or any other drug given.

Column 9: In case of yes, write the nature and site (LT/RT) of disability developed.

Form – P IV

Prednisolone Card

(This card should be kept with the patient)

INSTRUCTIONS

- TAKE PREDNISOLONE TABLETS AS SINGLE DOSE DAILY WITH MILK/FOOD BUT NEVER ON EMPTY STOMACH.
- RESTRICT SALT INTAKE TILL ON PREDNISOLONE.
- INFORM SOON IF YOU NOTICE BLACK STOOL (MALENA), PAIN UPPER ABDOMEN OR VOMITING.
- INFORM IMMEDIATELY IF DISCHARGE IN PLANTER ULCER, ANY FOCUS OF INFECTION, PERSISTING COUGH, MILD FEVER OR ANY DETERIORATION.
- DON'T STOP PREDNISOLONE BEFORE COMPLETION OF REGIMEN, EVEN IF THERE IS IMPROVEMENT OR DETERIORATION.
- REPORT FOR REVIEW/CHECKUP AND NEXT DOSAGE, EVERY FORTNIGHT.

NATIONAL Leprosy ERADICATION PROGRAMME

PREDNISOLONE – CARD

Name of the patient

……...……

Reg. No./ MDT No. ……

Type MB / PB

Date / Due Date of RFT ……

Indication for Prednisolone therapy:

Date of starting Prednisolone……..

Signature of MO/ Supervisor……

PREDNISOLONE RECORD

Dosage	Date of issue	Next due date	Signature
40 mg x 2 wk.			
30 mg x 2 wk.			
20 mg x 2 wk.			
Do (if required)			
15 mg x 2 wk.			
10 mg x 2 wk.			
5 mg x 2 wk.			

Other drugs issued……

……

Progress/Remarks

Signature of MO……

Name

……

Form – P V

Referral Register

PHC_____ District _____ State _____

S. No.	Name of the person	Age and Sex	Address	Reason/ indication for referring	Referred to	Date of referral	Referral services provided	Follow-up actions taken with date	
								Date	Action

Form – P VI

Referral Slip

(to be used by peripheral health worker)

PHC_____ **District** _____ **State** _____

Name of the person to be referred: _____

Age and Sex: _____

Address: _____

_____

_____

Clinical finding: _____

_____

Reason/indication: _____
for referring

Referred to: _____

Referred by:_____
(designation & place)

Signature & date: _____

Form – P VII

Referral Slip

(to be used by MO PHC)

PHC_____ **District** _____ **State** _____

Name of the person to be referred: _____

Age and Sex: _____

Address: _____

_____

_____

Clinical finding: _____

_____

Reason/indication: _____
for referring

Referred to: _____

Copy marked to District Nucleus on: _____

Action taken at referral centres: _____

_____

Instructions for follow up: _____

_____

Referred by: _____
(designation & place)

Signature & date: _____

Form - P.VIII

Profile of disabled Leprosy cases of PHC

PHC_____ District _____ State _____ Date of Report _____

S. No.	Total no. of Leprosy cases on record			No. of Leprosy cases assessed for disability			No. of cases with disability		
							Gr I	Gr II	Total
	UT	RFT	Total	UT	RFT	Total			

No. of cases disability-wise												
Hands					Feet					Eyes		
Anaesthesia palm	Claw hand	Ulcer	Absorption of finger	Any other disability	Anaesthesia sole	Foot drop	Ulcer – Foot	Absorption of toes	Other disabilities (Foot)	Lagophthalmos	Low Vision	Red Eye

Annexure XVI

Terms, Abbreviations and Definitions

A- MDT/ Accompanied MDT	:	A strategy proposed by WHO where people with Leprosy may, if they wish, receive the whole course of treatment at the time of diagnosis or provision of more than 1 BCP of MDT at a time.
Accessibility	:	**Accessibility** is a general term used to describe the degree to which a product (e.g., device, service, environment) is accessible by as many people as possible. Accessibility can be viewed as the "ability to access" the functionality, and possible benefit, of some system or entity. Accessibility is often used to focus on people with disabilities and their right of access to entities, often through use of assistive technology. Several definitions of accessibility refer directly to access-based individual rights, laws and regulations.
Anaesthesia	:	Loss of sensation
ANM	:	Auxiliary Nurse Midwife
ASHA	:	Accredited Social Health Activist – volunteer from the community identified to act as a link between the health service and the community.
Aqueous flare	:	The evidence of protein in the aqueous humour, a sign of breakdown of the blood aqueous barrier, often due to inflammation of the iris and ciliary body.
AWW	:	Angan Wadi Worker – Functionary from the Women Welfare and Child Development Department available for support to public health programmes including NLEP.
BCP	:	Blister Calendar Pack.
Blindness	:	Refers to a condition (WHO) where a person suffers from any of the following conditions, viz., (i) total absence of sight; or (ii) visual acuity not exceeding 6/60 or 20/200 (Snellen's method) in the better eye with correcting lenses; or (iii) limitation of the field of vision subtending an angle of 20 degree or worse.
Case of Leprosy	:	A case of Leprosy is a person with clinical signs of Leprosy, who requires chemotherapy (MDT).
CBR	:	Community Based Rehabilitation: A Strategy within general community development for the rehabilitation, equalization of opportunities and social inclusion of all people with disabilities.
CHC	:	Community Health Centre.
Claw hand/ Clawing	:	Deformity wherein there is hyperextension of the joints between the fingers and the palm (MP joint) and flexion of the joints of the fingers, (IP joints) appearing like feet of bird or lion.
CLTRI	:	Central Leprosy Training & Research Institute.

CMO	:	Chief Medical Officer – responsible for all public health programmes in a district.
Completed Treatment	:	A person who has completed full course 6 pulses of MDT in 9 months for PB & 12 pulses for MB in 18 months.
Congruence	:	Being open, honest and genuine. Congruence is present when what is said matches what is felt.
Contact examination	:	Examination of all household contacts of a new Leprosy patient for evidence of Leprosy by the health staff.
Corticosteroids:	:	A group of drugs known for their ability to suppress inflammatory response – used in the treatment of lepra reaction.
Crack	:	Discontinuity of the epidermis, usually seen in joint folds or on the sole where the skin is thick.
Nerve Decompression	:	To relieve pressure from the nerve by surgical intervention.
Decompression	:	To relieve from compression/pressure.
defaulter	:	An individual who fails to complete treatment within the maximally allowed time frame i.e., six months treatment for PB Leprosy must be completed within a maximum period of 9 months; similarly 12 months treatment for MB Leprosy must be completed within 18 months.
Deformity	:	A visible impairment, Change in size and shape of part of body.
De-habilitation	:	Deviation from normal habits (cultural and social) and profession.
Destitute	:	Living but life-less.
Disability	:	A broad term covering any impairment, activity limitation or participation restriction affecting a person or ability to perform an activity in the manner or within the range considered normal for a human being.
Disability Grade 1	:	Hands and feet: anaesthesia present, but no visible deformity or damage.
Disability Grade 2	:	Visible disability/deformity or damage of hand and foot; or eyes: severe visual impairment (vision worse than 6/60 or inability to count fingers at six metres)- as already mentioned, lagophthalmos, iridocyclitis and corneal opacities must be considered as grade 2. blindness..
District	:	An administrative entity in a country.
Dissociate sensory impairment	:	When different modalities of sensation (e. g. touch, temperature, pain, vibration, etc) are affected to different degrees at the same spot/area/ dermatome.
DLO	:	District Leprosy Officer – responsible for NLEP in the district.
DLS	:	District Leprosy Society – responsible for programme implementation in a district.
DPMR	:	Disability Prevention & Medical Rehabilitation.
Ectropion		Outward turning of the eyelid margin, so that it is not in contact with the eyeball.
EHF Score	:	Eye Hand Foot disability Scoring. The sum of the individual disability grades for each eye, hand and foot.
ENL	:	Erythema Nodosum Leprosum - An inflammatory condition of the skin chararterised by painful red nodules and often accompanied by fever and joint pains; a feature of the multibacillary form of Leprosy. ENL is often referred to as Type 2 Reaction.

Exfoliative Dermatitis	:	Condition characterized by universal erythema and scaling. Often seen as drug reaction (e.g. Dapsone).
Foot-Drop	:	Inability to move the foot up i.e., dorsiflexion, caused by the paralysis of the muscles which lift the foot.
Empathy	:	Trying to understand the client's world, their meanings, and their life through their eyes by listening actively using **reflecting, paraphrasing** and **clarification** skills.
Entropion	:	Inward turning of eyelid margin, toward the eyeball.
Equity	:	justice, impartiality and fairness.
Exposure keratitis	:	Inflammation of cornea due to inability to close the eye.
GHC/GHCS	:	General Health Care.
GOI		Government of India.
Haemolytic anaemia	:	Anaemia produced by destruction of red blood cells (can be caused by Dapsone). Hepatitis Inflammation of liver.
Handicap	:	Unable to perform desired normal role in the society.
Hypesthesia	:	Sensory impairment as district from loss, usually domically assessed in comparison with normal areas.
Ichthyosis	:	Condition where the skin is dry and scaly like that of a fish
IEC	:	Information Education & Communication
ILEP	:	The International Federation of Anti-Leprosy Associations
Impairment	:	Any loss or abnormality of psychological, anatomical structure or function caused by the disease or injury. It may be visible or invisible, temporary or permanent and progressive or regressive. Primary impairment may progress to the development of secondary impairments. Example: plantar ulcer, defective vision, contractures in fingers.
Incubation period	:	Time interval between entry of organism and onset of clinical symptoms /signs.
Iritis	:	Inflammation of the iris; commonly associated with inflammation of the ciliary body. The combined condition is iridocyclitis. Iritis is often referred to as anterior uveitis.
Jaundice	:	Condition characterized by yellowness of skin, Mucous membranes and white of eyes.
JALMA	:	Japanese Leprosy Mission for Asia (Leprosy institute for training and research in Agra).
Keratitis	:	Inflammation of the cornea. In avascular keratitis new blood vessels are not yet invading the cornea. Exposure keratitis refers to inflammation of the cornea due to exposure and drying of the surface.
Lagophthalmos	:	Inability to close the eye completely due to paresis of eyelid muscles
Lepra reaction	:	The sudden appearance of symptoms and signs of inflammation in the skin or nerves or eyes of a person with Leprosy.
Leprosy case	:	One who is having cardinal signs of Leprosy and has not completed a full course of treatment with MDT.
Leprosy cured person	:	Any person who has completed a prescribed course of MDT (6 months for PB/12 months for MB Regimen).
LT	:	Laboratory Technician.
Macule	:	Localized change in the colour of skin that is identifiable visually. Usually less than 1 cm to 1.5 cm in size. Larger lesions are often referred to as patch. There is no change in texture, or thickness in a macule.

MB/Multibacillary case	:	Multi Bacillary (more than 5 skin lesion or more than 1 nerve trunk involvement or bacteriologically positive) case.
MCR	:	Micro Cellular Rubber for making footwear; helps in redistribution of body weight.
MDT/Multidrug therapy	:	Multi Drug Therapy. The combined therapy which include rifampicin, clofazimine and dapsone and others recommended by WHO for treatment of multibacillary and paucibacillary Leprosy.
Meibomian glands	:	Glands situated in the tarsal plates of the eyelids secreting an oily substance, which spreads over the surface of the tear film and prevents excessive evaporation.
MO	:	Medical Officer.
MOHFW	:	Ministry of Health & Family Welfare.
MPHW/ MPW	:	Multipurpose Health Worker / Multipurpose Worker.
MPR	:	Monthly Progress Report.
NCDR	:	New Case Detection Rate.
Nephritis	:	Inflammation of the kidney.
NFI/Nerve function impairment	:	A loss of normal nerve function demonstrated by loss of sensation in the skin or reduced muscle power in its area of distribution.
Neuritis	:	Inflammation of nerve.
New case	:	A case of Leprosy who has never been previously registered/treated with anti-Leprosy chemotherapy.
NGO	:	Non-Governmental Organisation.
NLEP	:	National Leprosy Eradication Programme.
NLR	:	Netherlands Leprosy Relief.
Nodule	:	Swelling in the skin.
NRHM	:	National Rural Health Mission.
Oedema	:	A local or generalized condition in which the body tissues contain an excess amount of fluid.
Opposition	:	Bringing together pulp of thumb with pulp of other fingers.
Orthoses	:	A treatment device especially for hands and feet, such as splints and MCR footwear.
Persons affected by Leprosy	:	Person(s) affected by Leprosy.
Papule	:	A raised flat solid lesion, lying in layers of skin easily identified visually of size in diametre less than 1 cm. It may be skin colour, oedematous, scaly, warty (veroucous) etc. If topped with clear fluid filled lesion on its surface the lesion is then called a papulovesicle.
Passive movement	:	movement produced by assistance/an external force
PB/Pauci-bacillary Case	:	Case having up to 5 skin patches, with definite loss of sensation/ involvement of one peripheral nerve trunk involvement) and negative slit skin smears (if examined).
PCR	:	Polymerase Chain Reaction.
PHC	:	Primary Health Centre.
Plantar	:	Referring to the sole of the foot.
Plaque	:	A flat skin lesion, easily identified visually, may be solid and raised (larger sized, enlarged form of papule) or may be atrophic and depressed. It may have various colour changes or surface changes, as described for papule.

PMR	:	Physical Medicine and Rehabilitation.
PMW	:	Para Medical Worker.
POD	:	Prevention of Disability.
POID	:	Prevention of Impairments & Disabilities.
POWD	:	Prevention of Worsening of Disability.
PRI	:	Panchayati Raj Institutions.
Prosthesis	:	Artificial limb.
PT	:	Physio Therapist/Physio - Technician.
PWD	:	Person With Disability.
RCS	:	Reconstructive Surgery.
Reaction		An inflammatory episode that might occur during the course of Leprosy
Rehabilitation	:	Includes all measures aimed at reducing the impact of disability for an individual, enabling him or her to achieve independence, social integration, a better quality of life and self-actualization.(Reference: UN Standard rules for equalization of opportunities for persons with disabilities (PWD).)
Relapse	:	The re-occurrence of the disease at any time after the completion of a full course of treatment/cure.
Reversal reaction	:	Result of a sudden change in cellular immunity and is characterised by acute exacerbation of skin lesions and often accompanied by acute neuritis. Reversal reaction is also referred to as Type I Reaction.
RFT	:	Release from treatment(the end of treatment); this occurs when treatment with MDT has been successfully completed.
RLTRI	:	Regional Leprosy Training & Research Institute.
S/C	:	Sub-centre.
SHG/Self-Help Group (SHG):	:	Self Help Group: A small, economically homogeneous and affinity group of rural/urban poor, voluntarily formed to save and contribute to a common fund to be lent to its members as per the groups decision and for working together for social and economic upliftment of their families and community".
SIHR & LC	:	Schieffelin Institute of Health Research and Leprosy Centre.
Silent neuritis	:	Nerve damage without symptoms, Quiet nerve paralysis.
SIS	:	Simplified Information System.
SLO	:	State Leprosy Officer.
Social integration	:	Defined as the active participation of disabled and handicapped people in the mainstream of community life.
ST	:	Sensory Testing.
Synechiae	:	Adhesions between iris and anterior lens capsule.
Trichiasis	:	One or more eyelashes rubbing against the eyeball.
Ulcer	:	Discontinuity of the skin or mucous membrane .
Validity	:	The ability of a method or a test to find what the investigator is looking for.
VMT	:	Voluntary Muscle Testing.
WHO	:	World Health Organisation.
Wrist drop	:	Inability to extend wrist due to paralysis of muscles supplied by Radial nerve.

Annexure XVII References

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Self Assessment

Case Studies

Case Study: Programme Management & Treatment with MDT

Case 1:

Rahman, 35 year old male, on his visit to health centre for treatment of his son, was diagnosed to be suffering from Leprosy and was registered for treatment. While checking the treatment register at the end of the month, you noticed that he has not come to collect the medicine for the fourth month.

Discussion points:

- What are possible reasons for this?
- What action will you take to prevent such incidences in future?
- What modification will have to be made to his treatment?
- Discuss management of irregular treatment and defaulter.

Case Study: Epidemiology

Case 2:

Sushma, a multipurpose health worker of a sub-centre in your area informs you that an old woman, on treatment for Leprosy, has been abandoned by the family members, and she (Health worker), is unable to convince the family members to keep her in the house.

Discussion points:

- What are the possible reasons?
- How would you solve the problem?
- How such incidences can be prevented in future?

Case Study: Epidemiology

Case 3:

Lacchu, 42 year old male, came to health centre for treatment of skin lesions. He told the doctor that around two year back he had noticed a light coloured (hypo-pigmented) patch on his thigh but, as it caused no problem he did not seek any treatment. Recently, he developed, two more similar patches and got worried. He has been diagnosed as suffering from Leprosy and has been registered for treatment.

Discussion points:

- What do you interpret from this?
- How can similar situations be avoided in future?
- What specific measures can be taken to prevent similar situations in future?

Case Study: Epidemiology

Case 4:

*Asim,*13 year old boy, has been brought to health centre with a wound on the palm of right hand. The wound is painless and claw deformity of the little finger of the right hand was noticed on examination. On eliciting a detailed history it was learnt that the deformity of the little finger developed around six months back and he has been taking treatment for it from a local traditional healer.

- What does this indicate?
- What intervention do you need to take to control the transmission of the disease in the area?
- What other steps will you take to reduce the likelihood of something similar occurring in the area?

Case study: Pathogenesis/reactions

Case 5:

Mr. Suresh, a 47 year old male, diagnosed as MB Leprosy, was put under MDT immediately. He developed lepra reaction, after 3–4 months of starting MDT. Anti-reaction treatment was started with Prednisolone, 40 mg daily. When reviewed before releasing from treatment, lesions were found to be clinically active. He was examined for Bacterial Index (BI) & Morphological Index (MI), which was reported as BI = 3+ & MI = 12%.

Medial Officer advised him to continue MDT for another 12 months. After completion of 18 months of MDT (total), he was re-examined again for BI & MI, which showed BI = 2+; MI =5%. Before the completion of 24 BCP, BI & MI, was reported to be BI = 1+ & MI = 2%.

The patient was referred to the State Medical Board, Manipur, and Government of Manipur referred him to SLTRI Karigiri (a specialized centre for Leprosy). He was admitted and BI & MI were found to be BI = 0.5+ & MI = 2% respectively.

He was advised to stop MDT after 24 BCPs and put on Prednisolone 20 mg for one month which was reduced by 2.5 mg every month along with tablet Chloroquine and capsule Clofazimine (other drugs used for reaction,) by the specialist and was advised to report for follow up at SLTRI, Karigiri after 3 months. After 3 months BI & MI were found to be same i.e. BI = 0.5+ & MI = 2%. The patient is still having lepra reaction.

Discussion points:

B.I./M.I

- How is BI & MI done/read/reported?
- Where are the facilities available for BI & MI– nearest?
- Can it be done in more places where AFB microscopy is available?
- What is the MI report of an untreated newly diagnosed MB patient?
- How does BI & MI change with treatment?
- What changes earlier, and why?

Clinical aspects:

- Was MO correct to extend therapy? Why? What else could be done?
- What is the normal expected rate of change of BI after adequate treatment? Why?
- Who are the patients with high risk of reactivation/relapse?
- What type of reaction is more common in MB patients? Why?

- If the patient was managed by chloroquine and clofazimine, along with steroids, at Karigiri, what type of reaction do you think patient was having?
- What alternative management may have helped the patient?

Case Study: Diagnosis

Case 6:

13 year old female child was brought to health centre. Medical officer PHC found hypo pigmented patch on right hand with partial loss of sensation on skin lesion, no nerve could be palpated and no impairment of nerve function could be found on examination of the nerves. Medical Officers did not prescribe any MDT drug and advised that the child should be followed at frequent intervals

Discussion points:

- What type of Leprosy do you think the child is suffering from? Why?
- How does this form of Leprosy evolve?
- How should it be managed?
- How frequently should they be reviewed?
- What advise/counselling should patient/family receive?
- If patient cannot come as frequently for review as desired what can be done?
- What is the outcome that needs to be avoided?
- Would it be better to start MDT in such cases?
- Can MDT prevent evolution of disease?
- Can MDT prevent /reduce permanent nerve damage?

Case Study: Pathogenesis/Diagnosis

Case 7:

Manoj Kumar, an 18 year old motor mechanic, reported to the medical officer with complaints of pain in the right elbow, weakness in right hand and a persisting bend in the little finger of two months duration.

On examination, the medical officer found thickened and tender right ulnar nerve, sensory impairment on ulnar side of right hand and clawing of right little finger.

Apart from these signs, there were two big hypo pigmented patches with four satellite lesions on right arm.

On asking again, *Manoj* said that he had first noticed the patches one and half year ago, but did not seek any treatment for them.

Discussion points:

- What is the complete diagnosis? Why?
- At what stage has the patient come?
- How can this be changed?
- What is the prognosis for the patient?
- What are occupational implications?
- What action should medical officer take to avoid delayed reporting?
- What counseling should the patient and his family receive?
- What action you must take at the community level?

Case Study: Prevention of Disability (POD)

Case 8:

Mr. Kailash Singh, a 50 year old agriculture labourer, reported slipping of his *chappal*/footwear from his right foot, while walking, for the past ten days. His old Leprosy record indicates that, two year ago, he had completed MB-MDT for 24 months, for the treatment of multiple patches and was regular in taking the treatment.

Discussion points:

- What could be the cause of the complaint (Slipping of *chappals*) in Leprosy patients? What is the patho-mechanism?
- What do you think has happened in this case? What are the possibilities?
- How will you manage this case?
- What is his prognosis?
- How could this have been prevented?

Case Study: Reaction & POD

Case 9:

Mr. Karupaiyan, aged 38 year, works as a cook in a hotel. He developed nodules all over the body and pain in both his elbows. He took treatment for these complaints from a local General Practitioner, without much improvement. One day, his friend came to visit him and found it surprising when he observed that *Karupaiyan* could hold many moderately hot vessels without using any insulator/ protection. *Karupaiyan* told his friend that his ability was because of his long practice of holding hot things but his friend did not agree and asked him to consult a doctor. *Karupaiyan* therefore consulted the Medical Officer of the nearby health centre.

Discussion points:

- What do you think is the diagnosis?
- Why do you think the patient did not benefit from the treatment of the local General Practitioner?
- How will you manage this case?
- What specific counseling will you give this patient?
- What special precautions will you take?

Case Study: Treatment of Leprosy

Case 10:

Nafeesa, 32 year old, diagnosed as PB Leprosy, was registered for treatment in December, 2007. She took regular treatment for two months and took accompanied MDT for one month in March, and left for her native village. She came back in the month of June, to collect medicines, and disclosed that she has developed three more lesions now, making it a total of six lesions.

Discussion points:

- What are the possible reasons for this development?
- What step(s) will you take to decide/determine the exact/actual cause?
- What step(s) will you take to manage this new development?
- What special precautions may be necessary in the follow up of this case?

Case Study: POD

Case 11:

Rahman, 28 year old, an agriculture worker came to the health centre requesting medical officer to prescribe some tonic for him as he is developing weakness. On enquiry, he reveals that he feels weakness in his left hand and for the past two days, he has noticed that two fingers of his hand (little and ring finger) have become bent (hyper-extended at metacarpo-phalangeal joint and flexed at both the inter-phalangeal joint).

Discussion points:

- What is the most probable diagnosis?
- What do you expect to find by clinical examination of *Rahman*?
- What urgent step(s) is/are required to prevent permanent disability?
- What is the cause & how can such cases be prevented from occurring in the community?

Case Study: Reactions

Case 12:

Devi, a 30 year old woman, noticed a few patches on her leg and arm. She showed it to her husband. He took her to a general practitioner who, after examining the patch, told the patient that it was Leprosy. He prescribed Rifampicin 450 mg and Dapsone 100 mg daily for 15 days. *Devi* complied with the doctor's advice and took the drugs as prescribed.

On the 3rd day of treatment, *Devi* had high temperature. She noticed that the patches have turned an angry red colour and have swollen. Seeing the lesions worsening, she did not go to the treating doctor again.

Instead, she went to another doctor, who gave her some tablets for fever and sent her back. Though *Devi's* fever subsided, a few more patches appeared on her back. The deteriorating condition of her disease put *Devi* under mental agony.

A new problem erupted between her husband and *Devi*. He did not want to live with her any more. He was told by his relatives that *Devi's* disease could not be cured and they encouraged him to leave her. Taking this advice, he sent her back to her mother's home.

Discussion points:

- Was the diagnosis of the general practitioner correct?
- Why do you think the doctor treated *Devi* in this manner?
- Is the treatment given by the second doctor correct?
- Why do you think he treated *Devi* like this?
- How can such occurrences be prevented?
- How could *Devi's* mental agony have been prevented?
- Could *Devi's* family problem have been prevented?
- What action should be taken now?
- What treatment should *Devi* receive now?

Case Study: Reactions

Case 13:

Ram Prasad, 22 year old mechanic came to the health centre with a scarred hypo-pigmented skin lesion on his forehead. On enquiring it was revealed that he had developed this lesion one year back

and took treatment from a nearby doctor who had given him medicine for local application, saying that medicine will burn out the diseased tissue and thus cure it, but there was no effect and a scar developed over it. Now the lesion has become red and swollen;

Discussion points:

- What is the correct diagnosis?
- What causes Leprosy reactions?
- Why do Leprosy reactions occur after treatment?
- How would you confirm the diagnosis?
- How should the case be managed?

Case Study: Reactions during pregnancy

Case 14:

Harvinder Kaur, 38 year old female with 28 weeks of pregnancy was referred by the local dai to medical officer. She was suffering from temperature and had developed tender nodules under the skin over trunk and both the arms and leg. On examination left eye was found red and painful without any other significant finding. Discuss the case.

Discussion points:

- What is the Diagnosis?
- How will you confirm the diagnosis?
- What complication can arise in this case?
- How is her physiological state of pregnancy related with the diagnosis?
- Is this type of presentation typical?
- She is worried about her baby. What will you tell her?
- How should a medical officer manage this case?

Case Study: Reactions

Case 15:

Kamala, 35 year old female noticed few nodules on her arms and thought it to be mosquito bite. When similar nodules appeared on the thighs two days later she got worried. She confided in her husband. They decided to consult a skin specialist. They went to a well known dermatologist who had retired from services, long time back. He suggested biopsy. The report was found negative for Leprosy. The dermatologist was not happy with the report. He referred *Kamala* to a former colleague of his who had also retired form service. He took smears form the ear lobes, thighs and arms. It was found to be 5+. He put her on a regimen of daily Rifampicin (600 mg) and Dapsone 100 mg. The condition became worse. She developed new painful lesions all over with high fever and joint pains.

The couple became scared. They went to a dermatologist in a well – known corporate hospital. He stared Clofazimine 300 mg a day and prednisolone 40 mg a day in addition to her previous treatment. There was improvement for sometime. When the prednisolone was reduced to 20 mg new lesions appeared. She had such exacerbation about thrice after that. She was referred to Leprosy centre.

The patient was anxious. She had developed cushingoid features. She was febrile. She had reddish-brown pigmentation of the skin. She had painful, tender nodules on the neck, arms, thighs and legs. Nerves appeared to be normal. There was no deformity.

Discussion points:

- What lessons do we learn from the history of the patient?
- Why was this unusual types of treatment started?
- Why did the patient's condition worsen?
- What is the condition that she is suffering now?
- Why is her skin reddish brown?
- How should the patient be managed now?
- Can you name some other drugs that may be useful in her condition that can be given at referral centres?
- How will you counsel her?

Case Study: Reactions

Case 16:

Santi, 42 year old female came to the health worker and requested her to write some good ointment for healing of a wound. On examination, it was found that she had an ulcer on the hypo-thenar eminence of left hand. Ulnar nerve was thickened and muscle weakness was obvious in left hand. On exploration it was revealed that such wound appears repeatedly, especially after working on chara (manual grass cutting machine for cattle feed) machine. On examining the hand it was found that her ring finger and little fingers are bent. She has told the worker that it has been like this for four months, since her fall from the steps. HW referred the person to the doctor who found left ulnar nerve thickened and sensory loss on the medial 1/3 of the palm.

Discussion points:

- What deformity is the patient suffering from?
- What clinical assessment can you use to check for nerve function in this patient?
- How will you manage this case?
- What all has contributed to the occurrence of this type of a case?

Case Studies: Reactions

Case 17:

Suru, 18 year old female, registered for MB Leprosy, came to the health centre with complaint of redness and pain in the right eye along with deterioration of vision. On detailed evaluation and history taking, history of appearance of tender nodules on both the arms 15 days back was extracted.

Discussion points:

- What is your diagnosis?
- Why does it occur?
- What other complications can arise in this patient?
- How will you mange this case?

Case 18:

Mr. Haribhau Hatkar, 52 year old, had developed tingling sensation in the right leg about six months back. He went to a local practitioner, who assured him that it was not serious. He was prescribed some B complex. He became worried when a blister appeared on the underside of his right big toe and went to a reputed medical college hospital on advice of his son's friend, a soldier. He consulted the neurologist, subjected to various investigations, pronounced normal and prescribed injections of B complex.

About six weeks later he found that his right foot was not holding on to the *Chappal* and it was slipping out of his feet easily. He met a friend who noticed multiple skin patches and brought him for advice to health centre.

Discussion points:

- Why did the slipping of *chappals* develop in this case?
- How can you confirm your diagnosis – investigation?
- What local complication may develop in the leg if he is left untreated?
- How would you manage trophic ulcer?
- What advice will you give him to prevent further occurrence of trophic ulcers?
- What steps can you take to prevent such delayed detection and treatment in your area?

Case Study: IEC

Case 19:

A treated case of MB Leprosy visits health centre with the complaints that hypo pigmented patches are not disappearing and he is still, unable to feel hot or cold by his affected hand, unable to hold things with the same hand and, is anxious to know whether he is actually cured of the disease. How will you convince the patient that disease has been cured?

Discussion points:

- What is the evolution of skin lesions with treatment? (?hypo pigmented, ?erythematous lesions)
- What happens to sensations and nerve function following treatment?
- What can a patient with advanced and complicated Leprosy expect from a cure?

Case Study: POD

Case 20: (Role Play) -

Counselling a case for better patient compliance and self-care as per given structured script of role play-

Discussion points after role play:

- What is the problem of Hari Ram?
- Since how long the problem existed?
- Why did this problem occur?
- What possible alternatives or options can be made available?
- What is counseling and how it is done?

Case Study: Monitoring exercise

Case 21:

In a Block PHC X having population of 100000, while analyzing NLEP indicators of last five year it was found that NCDR has come down from 89 to 10 per 100000 population but MB proportion has gone up from 25% to 60% and Disability Gr-II proportion has gone up from 3% to 10%.

Discussion points:

- How is MO PHC going to explain NLEP situation of his block in review meeting?

Case Study: Monitoring exercise

Case 22:

MPW of sub-centre X has gone on maternity leave and a new health worker has joined in her place. Medical officer of a PHC noticed that within two months there has been a sudden increase in the reporting of the Leprosy affected persons with grade 2 disability from the area covered by that sub-centre.

Discussion points:

- How would you manage the situation? Outline a plan and its implementation time line.

Case Study: Monitoring exercise

Case 23: During a meeting you received the following data from the two sub-centres:

	Sub-centre A	Sub-centre B
Total new cases registered	12	5
PB cases	9	1
MB cases	3	4
Children < 10 year	0	2
New cases with grade 2 deformity	0	3

Discussion points:

- Which sub-centre is doing better? Why?
- Outline steps for improving function of the other centre. Identify indicators. Create a time line

Case Study: Supervision

Case Study 24:

District Leprosy Officer examined the records and reports from PHC X and observed that the number of defaulters and wrong diagnoses are more than the district average and found the data of the report inconsistent. He decided to send supervisor to improve the situation.

Discussion & Group Work

- What are the points to be supervised and how?

Self Assessment

Answers (Hints): Case Studies

Case 1:

Possible reasons:

- Leprosy skin lesions are not painful per se and tend to be clinically silent.
- He has probably not been counselled properly about Leprosy and the potential damage untreated Leprosy can cause him.
- Health care workers are not looking at their registers and following drop-outs regularly.
- They have not been oriented/supervised properly about Leprosy management.
- Out reach workers have not been briefed about the case and need for timely retrieval or home visit/delivery of treatment (if justified).
- IEC activities and/or its results around where Rahman lives appears inadequate.

Action to be taken:

- Health workers to retrieve the absentee.
- Find reason for absence and try to solve problems, consider A- MDT.
- Educate/Counsel him either personally or through health worker that:
  - Leprosy skin lesions are not painful per se and tend to be clinically silent.
  - Leprosy has the potential to cause permanent and irreversible deformity and damage.
  - Leprosy can be treated with MDT and timely treatment can prevent permanent damage.
- Intensify IEC activities.
- Train health functionaries.
- Close supervision and monitoring.

Modifications in the treatment:

- As person has missed dose of one month, no modification in treatment is required; continue as before.
- Consider the need of Accompanied - MDT.

Case 2:

Possible reasons:

- Poor awareness due to poor/irregular/badly implemented IEC activities in the region.
- Low incidence/prevalence of Leprosy in the region and people not aware.

Solve the problem:

- Counseling of family members, peers, etc., personally by medical officer.
- Intervention through local self government officials, administration, police, department of social welfare etc.
- Temporary admission at health facility (as feasible) while administering initial therapy.

Action:

- Plan and implements intensive IEC activities in the area and sensitize stakeholders.

Case 3:

Interpretation:

- Late reporting
- Lack of awareness in general population
- Health workers probably not trained to suspect Leprosy
- Low importance given to Leprosy by health team
- Irregular/poorly planned or implemented/low penetration of IEC activities

Action:

- Plan and implement intensive IEC activities in the area
- Re-orientation and refresher training of health care team, in stages
- Intensify Leprosy related activities
- Close supervision and monitoring

Case 4:

Indicates:

- Rampant unawareness regarding Leprosy in the community
- Probably active transmission of Leprosy in the community
- Poor health seeking behaviour
- Health worker not able to suspect Leprosy
- Persisting belief in traditional/magical remedies at the expense of scientific proven therapies

Reduce transmission:

- Check records, number of Persons affected by Leprosy reporting from area, at what stage (late/early), their age
- Contact examination
- Intensify IEC activities
- Train health workers to identify Leprosy cases and refer them for treatment
- Active survey in the area/need for improved community surveillance and disease mapping

Action to prevent in future:

- Need for well planned IEC strategy to overcome above situation in the community
- Plan Leprosy related activities and train health workers

Case 5:

- BI & MI are done through Slit Skin Smear examination, refer B.I./M.I. Annexure. BI should be less than 2 + after completion of treatment.
- Facilities for BI & MI are available at District hospitals, medical colleges, NGOs with referral facilities, PMR institutions and can be made available at microscopic centres under RNTCP.
- MI of untreated newly diagnosed MB Leprosy person is more (70% and above) and declines to 3% – 5% with treatment.
- MI changes faster and earlier than BI. BI may be high even on completion of treatment.
- Yes, because BI was more than 2+.
- With adequate effective treatment BI falls by 1 log/year i.e. 1+/year.
- Patients with BI >2+ at end of therapy are at higher risk of relapse as compared to those with BI <2+.
- Type 2 (ENL) reactions are seen only in bacilliferous (MB) patients as they have both plenty of bacterial antigen, as well as high titers of anti bodies to M. leprae antigen (non-protective) in their tissues.
- Severe Type 2/(ENL) reactions.
- Thalidomide or other immunosuppressive (cytotoxic) drugs given under expert supervision may have helped the patient by controlling the reaction and reducing side-effect of steroid. BI should be 2 + or less after completion of treatment.

Case 6:

Diagnosis:

- PB Leprosy – probably of the indeterminate type (see annexure on Immunological spectrum of Leprosy – Ridley & Jopling (s): single lesion (Macule), variable/partial sensory loss, no nerve abnormality.

Evolution of the Disease:

- This is an early type of clinical Leprosy.
- The disease has become clinically detectable in the form of a skin patch with/without sensory loss and no detectable nerve involvement or demonstrable AFB.
- The immune response of the host at this stage is in evolution and has not matured enough to be defined.
- The bacillary load is very low, thus this is a type of PB Leprosy.
- Most patients develop effective immune response and overcome/eliminate the infection.
- However, some patients do not acquire an effective immune response and can develop a multi-bacillary disease.
- Patients should be put on MDT for PB Leprosy. In case of doubt, refer person to more experienced person for confirmation of diagnosis.
- Patients should ideally be followed up monthly, to detect whether their disease is progressing into the MB type of disease: getting multiple nerve involvement, worsening sensory loss and easily detectable bacillary loads.
- Educate/counsel him that he is suffering from Leprosy, which may heal on its own or may get worse, potential damage untreated Leprosy can cause, that can be prevented by timely treatment with MDT and must report on earliest sign of nerve involvement.

- Close monitoring, early detection of nerve involvement and timely intervention can prevent permanent nerve damage.
- Alternatively, Outreach health worker(s)/sub-centre staff could be trained/ oriented to provide follow up assessment at home/sub-centre.
- Avoid, reactions and disability due to nerve damage.
- It is better to start MDT in such cases unless one can follow up the patient very closely.
- MDT can stop evolution of the disease.
- Leprosy can be treated with MDT and timely treatment can prevent permanent damage, good follow up and early detection can lead to timely intervention to prevent permanent nerve damage.

Case 7:

Diagnosis:

- PB Leprosy, Neuritis (Rt. Ulnar), Rt. Claw hand, Grade 2 deformity.
- Late presentation
- In need of awareness generation
- Good prognosis, less than six months duration of neuritis, significant/total reversal can be expected.
- Residual weakness will have implications – occupationally, sensory impairment has serious implications due to possible occupational trauma.

Counsel about:

- Potential damage untreated Leprosy can cause.
- Leprosy has the potential to cause permanent and irreversible deformity and damage but can be treated with MDT and timely treatment can prevent permanent damage.
- Importance of regular and complete treatment with MDT and Steroids.
- Care of insensitive and weak part of the body.
- Procedures of self care.
- Health care workers should be re-oriented/supervised properly about Leprosy management.

Action at Community Level:

- Plan and implement intensified IEC activities.

Case 8:

Cause in Leprosy patients:

- Paralysis of peroneal/anterior leg muscles, resulting in inability to dorsi-flex foot and toes.
- Neuritis, due to relapse/reactivation of Leprosy or delayed reversal reaction, the relatively acute development favours a reactional etiology. However, the absence of pain as a symptom is against reaction.

Counseling:

- Explain to him it is a delayed type of damage that occurs because of remaining dead bacilli in the nerve. The disease has actually not recurred. With proper management one can expect a complete recovery.

Management:

- Rest and static splint initially followed by Dynamic splinting for his affected foot.
- NSAIDS and corticosteroids in the appropriate doses.

- Careful and close monitoring for improvement and/or worsening.
- Early referral to higher appropriate centre, while on steroids/medications, if no recovery seen in 2–3 weeks.

Prognosis:

- Good, can expect to make complete recovery if treated and followed up correctly.

Prevention:

- Complete prevention, perhaps impossible. But probability could have been minimized by educating patient well, close follow up after removal from therapy, and careful clinical evaluation at follow up.

Case 9:

- Diagnosis: MB Leprosy with neuritis and type 2 reaction
- Not benefitted: Inappropriate therapy
- Management: MB (Adult) MDT, enhanced doses of clofazimine (upto 300 mg/day), Corticosteroids and NSAIDs, rest, splints (neutral position, dynamic), passive movements, galvanic muscle stimulation, counseling and education.

Counsel:

- Recognize muscle/motor weakness, neuritis, and report worsening/increase.
- Care/protection of hands/feet, particularly occupational trauma, use protective gear while working, final check before going to bed every night.

Precautions:

- Frequent fortnightly follow up, careful assessment charting/recording of nerve involvement, dose adjustments of drugs to suppress reaction.

Case 10:

Reason:

- Poor immune response and/or inadequate treatment
- Developing type 1 reaction
- Inadequate clinical examination and wrong initial classification of MB as PB
- Resistant infection

Action by MO for diagnosis & Management:

- Refer case to referral centre and get patient to follow advice as given by experts, on follow up.

Follow up:

- More frequent follow up if it is reaction, to detect neuritis early.

Case 11:

Diagnosis:

- PB Leprosy with early Lt. Ulnar nerve paralysis due to neglect in addressing loss of sensations.

May find:

- Lt Ulnar N thickening/tenderness (? Other nerves)
- (?5 or less) skin patches

Management to prevent permanent disability:

- Start Appropriate MDT after careful evaluation.
- Rest and Dynamic splinting of his affected hand.
- NSAIDS and corticosteroids in the appropriate doses.
- Careful and close monitoring for improvement and/or worsening.
- Early referral to higher appropriate centre, while on steroids/medications, if no recovery seen in 2–3 weeks.

Prevention: Awareness, IEC campaign

Case 12:

- Yes, Diagnosis of G.P was correct.

Why treated like this:

- Older physicians familiar with lifelong dapsone mono-therapy for multibacillary Leprosy; often feel that single monthly dose of rifampicin, in a one year fixed duration therapy is inadequate treatment for MB Leprosy and use unjustified and scientifically unproven modifications. They need to be reoriented to the national programme Guidelines.

Treatment by second doctor & its cause:

- Not correct. The doctor is probably treating symptomatically for fever without realizing that the cause is a type 2 lepra (ENL) reaction.
- Unfamiliarity with Leprosy and its various presentations, a fairly common occurrence.

Prevention:

- CME and IEC activities including refresher and reorientation workshops/symposia.

Prevention of mental agony:

- Counseling, confidentiality (from husband) and high degree of awareness (through IEC campaigns in the community) could have prevented Devi's mental agony.

Prevention of family problem:

- Yes. Confidential counseling to both patient and spouse, and awareness building (through IEC campaigns in the community) could have prevented Devi's family problem.

Action needed currently:

- Multi pronged strategy
- Specific intervention at home for relatives by doctor, health worker, educated peers, panchayat office-bearers etc.
- Counseling about fundamental rights (no discrimination due to illness).
- Intervention by medical, administrative/executive officials and social welfare officials

Management:

- Treatment for Type 2 (ENL) reaction along with MB-MDT (Adult) with increased doses of clofazimine (100 mg 2–3 times/day). Look for and report at earliest sign of nerve, or other specific organ damage.

Case 13:

Diagnosis:

- Type 1 lepra reaction in ?PB Leprosy patient

Cause:

- An abrupt/sudden change in the immune status/response of the patient causes immune cells (lymphocytes) to rush into the site of infection, where M. leprae antigens are plentiful.

Why after treatment:

- Killing of M. leprae by MDT and subsequent rupture/release of dead M. leprae and its degenerative debris from the macrophage allows immunological reactions to take place. The lipid rich, antigenic, cell wall of M. leprae is not easily broken down by macrophages, even after the bacilli have been killed by MDT. Release of antigen, from the dead M. leprae laden macrophages, or enhanced antigen presentation as a result of altered cytokine milieu (due to any cause – like intercurrent infection, etc), could trigger these reactions.

Confirmation of diagnosis:

- Elicitation of a (the) cardinal sign(s) at the time of presentation would have clinched the diagnosis.
- Presence of a cardinal sign or a diagnostic skin biopsy would confirm diagnosis. A clinical assessment will classify patient into appropriate treatment category. Patient should receive appropriate MDT as well as treatment for type 1 lepra reaction.

Management & counsel:

- Complete course of MDT, monitor for nerve damage due to reaction and report promptly if it occurs, treatment for reaction as prescribed. Residual scar of the treatment can be attended to by cosmetic procedure after Leprosy has been adequately treated.

Case 14:

Diagnosis:

- Pregnancy with MB Leprosy with Type 2 lepra (ENL) reaction, with uveitis.

Confirm diagnosis:

- Detailed clinical examination, skin slit smear if facilities permit, urgent referral to an ophthalmologist, while starting appropriate (MB-MDT) with increased doses of clofazimine (100 mg three times/day) and corticosteroids.

Expected complications:

- Impairment of vision and involvement of other nerves?

Relation to pregnancy:

- Has developed Type 2 Lepra (ENL) reaction with uveitis.
- Perhaps it has been triggered by the inherent immunological instability that occurs in pregnancy.

Whether presentation typical to pregnancy:

- Usually reactions are more frequent post partum. Pregnant patients should be counseled to anticipate and be prepared for such a situation.

- Largely yes, after 28 weeks gestation most organogenesis/differentiation is complete (However, she should receive as low corticosteroid doses as is feasible).

About baby:

- Babies in such a situation can be born preterm or can be small for dates (underweight). However, with close follow up and specialized gynecologic care she can expect a normal child.

Management:

- The Medical officer should refer the patient immediately to both an obstetrician as well as an ophthalmologist to determine fetal well being as well as status of eye by slit lamp and other examination. MB-MDT drugs with higher doses of clofazimine, as well as steroids as indicated must be started early.

Case 15:

Lesson learnt:

- Leprosy is still a poorly understood disease by a large majority of our doctors whether clinician or a laboratory professional. Some specialists (dermatologists, leprologists) on the other hand may have a vast body of experience in the management of this disease.

Why unusual type of treatment:

- Older practitioners (from pre-MDT era) are not fully convinced/conversant about the efficacy of MDT and tend to modify treatment as per their own belief and not as per the national programme Guidelines.

Cause of worsening of condition:

- Killing of M. leprae and release of antigen which combined with antibodies (non protective) to precipitate in the tissues as immune complexes. Clofazimine has anti-reactional therapeutic effect apart from its anti M. leprae role, but surprisingly, was not started (? Fear of pigmentation)

Diagnosis:

- Chronic ENL reaction and iatrogenic Cushing(oid)'s

Brown discolouration of the skin:

- Due to deposition of clofazimine in the dermis and subcutis.

Management now:

- Alternative steroid sparing agents must be tried, Thalidomide, Clofazimine, azathioprine etc.

Other drugs:

- Thalidomide, azathioprine, Cyclophosphomide, Chlorambucil, Mycophenolate mofetyl, leflunomide, tacrolimus

Counsel:

- Cause of the problem
- Regularity of medication
- Regularity of follow up

- Regularity of laboratory tests
- Look for S/S of nerve damage, eye damage
- Report promptly in case any physical/symptomatic worsening

Case 16:

Deformity:

- Lt. Ulnar claw hand with grade 2 disability (ulcer on hypothenar eminence)

Clinical assessment:

- ST & VMT (little finger out test) See Tests for ulnar palsy/clawing

Management:

- The case should be referred to dermatologist/orthopedic surgeon, to rule out traumatic ulnar nerve damage and confirm Leprosy.

Cause of occurrence:

- Ignorance, poor health seeking behavior, lack of knowledge/ IEC to community, lack of precautions and self care.

Case 17:

Diagnosis:

- ENL with uveitis

Cause:

- Type 2 Gell and Coombs' Hypersensitivity – Immune complex deposition in inflamed tissues activate complement and the inflammatory cascade. Immune complexes are formed when sudden increase in mycobacterial antigen release occurs and these combine with antibodies already circulating in the tissues/system.

Other complications:

- Hepato-splenomegaly, cholestatic jaundice
- Bone marrow hyper-proliferation, bony tenderness
- Generalized lymphadenopathy
- Glomerulonephritis
- Neuritis
- Uveitis
- Epididymo-orchitis
- Endocarditis
- Arthritis

Management:

- MB-MDT with higher doses of clofazimine, corticosteroids, NSAIDs, etc., Urgent referral to ophthalmologist.

Case 18:

Cause of slipping of chappal:

- Loss of foot dorsi-flexion/eversion rhythm due to weakness/paralysis of muscles supplied by common peroneal nerve.

Confirm diagnosis:

- Slit skin smear for AFB, skin biopsy from lesion(s) for histopathology, nerve biopsy for histopathology, tests for (incipient) foot drop.

Complications:

- Foot drop, plantar ulcer/injuries

Manage tropical ulcer:

- Rest, dressings, foot-elevation, appropriate footwear, …

Prevention of ulcer:

- Wear appropriate footwear (with dynamic splint), self-care of feet, full course of MDT, cortico-steroids.

Prevention of delayed reporting:

- IEC, camps etc.

Case 19:

Evolution of skin lesions:

- Recovery over time (up to several months)

Recovery of Loss of sensation:

- Fresh loss usually recovers. Long standing loss may not recover completely.

Cure of advanced disability:

- Persisting deformity/disability which may require special rehabilitation measures/ surgery

Case 20:

Problem:

- Recurrent planter Ulcer

Cause:

- Excessive use of the foot

Alternatives:

- Hand operated/electrically operated machine/use other foot/swapping jobs

Counseling:

- SSO, self-care and above mentioned points.

Case 21:

- As the load of the disease declines in an area, NCDR declines over time as less of the new cases appear, but disease has a long incubation period and cases with pure nerve involvement may present late as they are difficult to diagnose and may present with grade 2 disability.

Case 22:

- Health worker of sub-centre A is probably doing better as more cases are detected, cases are detected early, leading to less of active two community.
- Plan and implement intense IEC activities in the area for three months.

- Arrange for active search if needed after three months.
- Find the problem and arrange for training of the worker accordingly.
- Tell the indicators and what do they interpret.
- Useful Indicators are:
    - Newly detected cases,
    - Proportion of children among newly detected cases.,
    - Grade 2 disability among newly detected cases.

Case 23:

- Health worker of sub-centre A is probably doing better as more cases are detected, cases are detected early, leading to less of active transmission of disease, and less of grade 2 disability.
- Close monitoring and supervision required for sub-centre B. exclude re-registration of cases, find health seeking behaviour of the two community.
- Plan and implement intense IEC activities in the area for three months.
- Arrange for active search if needed after three months.
- Find the problem and arrange for training of the worker accordingly.
- Tell the indicators and what do they interpret.
- Useful Indicators are:
    - Newly detected cases,
    - Proportion of children among newly detected cases,
    - Grade 2 disability among newly detected cases.

Case 24:

Observe & discuss during supervisory visits:

- While MO is examining the suspected patients to confirm diagnosis.
- Able to elicit sensation in the skin correctly.
- Palpate nerves correctly.
- ST and VMT of nerves.
- Ask what type of problems do they face.
- What is the referral criteria to confirm diagnosis.
- Observe the behaviour of the staff with patients.

Observe & discuss during supervisory visits:

- Observe while they counsel the patient.
- Ask how do they find that Persons affected by Leprosy has not come to collect medicine.
- What action do they take.

Discuss freely the problems encountered by them in their routine work

- Check the records for full address of the patients, number of defaulters, action taken and persons retrieved.
- Talk to the defaulters, their perception about the quality of care, problems encountered by them.

Self Assessment

Pre/Post Test Questionnaire

Tick mark (√) (in given boxes) on correct answers of the following questions.

		Yes	No
1.	• Leprosy is caused by bacteria.	☐	☐
	• Leprosy is an air borne disease.	☐	☐
	• Prolonged contact is essential to get Leprosy.	☐	☐
	• Leprosy is hereditary.	☐	☐
	• Immunity plays a major role in development of disease.	☐	☐
2.	• Mycobacterium leprae can penetrate intact skin.	☐	☐
	• Mycobacterium leprae can invade central nervous system.	☐	☐
	• Mycobacterium leprae can produce planter ulcers.	☐	☐
	• Mycobacterium leprae can damage trigeminal nerve.	☐	☐
	• Mycobacterium leprae can damage abdominal viscera.	☐	☐
3.	Cardinal signs to diagnose Leprosy are:		
	• Hypo pigmented patch over skin with sensory loss	☐	☐
	• Clawing of hand	☐	☐
	• Planter ulcer	☐	☐
	• Milky white patches over skin	☐	☐
	• Thickened peripheral nerve with sensory loss in its area of supply	☐	☐
4.	Criteria for classifying a case of Leprosy as PB are:		
	• Skin lesions less than 5 in number	☐	☐
	• Skin lesion less than 10 in number	☐	☐
	• One trunk nerve thickened	☐	☐
	• Skin smear positive for lepra-bacilli	☐	☐
	• Infiltration of ear lobes	☐	☐
5.	• Multi Drug Therapy (MDT) is safe and effective.	☐	☐
	• Rifampicin (bactericidal drug) is an essential component of MDT.	☐	☐
	• MDT prevent emergence of drug reaction.	☐	☐
	• Hepatitis is contraindication of MDT.	☐	☐
	• Duration of MDT for MB cases as per NLEP is 2 year.	☐	☐

		Yes	No
6.	• Leprosy cases should be isolated during treatment.	☐	☐
	• Leprosy cases should not go for marriage.	☐	☐
	• Leprosy is transmitted genetically.	☐	☐
	• Leprosy cases should not be allowed to work in factory or offices.	☐	☐
	• Community should have sympathetic attitude and behaviour toward Leprosy cases.	☐	☐
7.	• Peripheral nerves are damaged due to Leprosy.	☐	☐
	• Those Leprosy cases who are not taking treatment may become deformed and disabled.	☐	☐
	• Deformed cases are always infectious and contagious.	☐	☐
	• Deformities due to Leprosy can be prevented and corrected.	☐	☐
	• A Leprosy sufferer may become blind if not treated.	☐	☐

8. Match the following:

a.	Lepra reaction	a.	Lagophthalmos
b.	Aneasthesia sole	b.	Foot drop
c.	Facial nerve	c.	Wrist drop
d.	Radial nerve	d.	Prednisolone
e.	Lateral popliteal nerve	e.	MCR foot wear

9. Match the following:

a.	On the job training	a.	Quite nerve paralysis
b.	Total destruction of all M. leprae	b.	Supervision
c.	Silent neuritis	c.	Creating awareness
d.	Nerve function assessment	d.	Eradication of Leprosy
e.	Information, Education and Communication	e.	Voluntary muscle testing

10.	• Relapse cases can be managed at PHC.	☐	☐
	• Skin smear is essential for all new cases.	☐	☐
	• Sudden blindness can occur in Leprosy.	☐	☐
	• Self care by Persons affected by Leprosy is essential for POD.	☐	☐
	• Feedback on reports improves program.	☐	☐

Date: Name:

Signature:

Self Assessment

Additional Questions

Questions given below may be used to develop a pre/post test questionnaire by facilitators or used for self assessment by trainees.

1. An unique commonly affected cell in Leprosy is:
   a) Schwann cell
   b) Macrophage
   c) Endothelial cell
   d) Muscle cell

2. The multiplication time for *Mycobacterium leprae* is:
   a) 1–5 days
   b) 8–10 days
   c) 11–13 days
   d) 16–29 days

3. Which type of immune response is protective and also determines the spectrum of the disease in Leprosy?
   a) Cell mediated immunity
   b) Humoral immunity
   c) Ig E mediated hypersensitivity response
   d) All the above

4. All these feature support the diagnosis of Borderline tuberculoid Leprosy except:
   a) Well defined hypo-pigmented patch/plaque
   b) 50-60% sensory loss over the lesion
   c) Enlarged peripheral nerve near patch
   d) Loss of hair and sweating over the lesion

5. Leonine facies involve all features except:
   a) Infiltrative skin lesions appear on cheeks, earlobes and maxillary eminences.
   b) Skin of the face becomes thickened due to infiltration and nodulation.
   c) Nose becomes swollen and broadened.
   d) Eye brows become thick

6. Nasal involvement in Leprosy most commonly manifests as:
   a) Nasal congestion due to chronic inflammation
   b) Parosmia
   c) Hypertrophy of nasal septum
   d) Deviated tip of the nose

7. All are features of type I reaction in Leprosy except:
   a) Erythema and oedema of the lesions
   b) Type III hypersensitivity reaction
   c) Inflammation of the peripheral nerve
   d) Appearance of new lesions

8. Most common cranial nerve to get involved in Leprosy:
   a) Facial nerve
   b) Optic nerve
   c) Hypoglossal nerve
   d) Olfactory nerve

9. Nerve involvement in Leprosy presents as:
   a) Nerve thickening
   b) Tingling sensation over the course of nerve
   c) Inflammation of the nerve
   d) All the above

10. Clawing of the toes is due to involvement of the:
   a) Posterior tibial nerve
   b) Sural nerve
   c) Femoral nerve
   d) Lateral popliteal nerve

11. All are features of motor involvement of peripheral nerve in Leprosy except:
   a) Wrist drop due to radial nerve
   b) Claw hand due to ulnar nerve
   c) Foot drop due to sural nerve
   d) Clawing due to median nerve

12. Relapse in Leprosy is typically characterized by:
   a) A positive slit skin smear
   b) Increased size of lesions, but no new lesions
   c) Neuritis
   d) Presents year after stopping adequate treatment for Leprosy

13. Specific test(s) for ulnar nerve motor involvement is/are:
   a) Froment's/book test
   b) Card test
   c) Abduction of the little finger
   d) All the above

14. Lid lag is due to involvement of the following nerve:
   a) Facial nerve
   b) Trigeminal nerve
   c) Occulomotor nerve
   d) Optic nerve

15. Lagophthalmos is due to involvement of the following muscle:
    a) Orbicularis occuli
    b) Orbicularis oris
    c) Procerus
    d) Levator palpebri superioris

16. First sensation to be lost in Leprosy:
    a) Touch
    b) Pain
    c) Temperature
    d) Vibration

17. Type II reaction is characterised by all, except:
    a) Multiple crops of erythematosus tender evanescent papules/nodules/plaques
    b) Neuritis
    c) Type IV hypersensitivity change
    d) Arthritis

18. Drug of choice for type I reaction is:
    a) Thalidomide
    b) Systemic corticosteroids
    c) Hydroxy chloroquine
    d) Antimonial compounds

19. Treatment of neuritis in the acute phase involves:
    a) Active exercises
    b) Passive exercises
    c) Rest of the affected limb in "neutral" position
    d) Surgical exploration

20. Histoid Leprosy is characterised by:
    a) Multiple erythematous succulent papules
    b) Absence of solid staining lepra bacilli from lesions
    c) Short course of disease
    d) Use of steroids necessary in management

21. Which of the following patients should receive PB-MDT therapy:
    a) 6 skin lesions and one thickened nerve. SSS 2+
    b) Single skin lesion and 2 nerves thickened. SSS negative
    c) 2 skin lesions and one thickened nerve. SSS negative
    d) Single skin lesion and single nerve thickened. SSS 1+

22. Correct MB-MDT dose (Rifampicin, Clofazimine, and Dapsone) for a 13 year old child is:
    a) R - 600 mg monthly, C - 300 mg monthly & 50 mg daily, D - 100 mg daily
    b) R - 450 mg monthly, C - 300 mg monthly & 50 mg A/D, D - 50 mg daily
    c) R - 450 mg monthly, C - 150 mg monthly & 50 mg daily, D - 50 mg daily
    d) R - 450 mg monthly, C - 150 mg monthly & 50 mg A/D, D - 50 mg daily

23. Which of the following statements is false:
    a) PB-MDT is of 6 months duration to be completed in 12 months
    b) MB-MDT is of 12 months duration to be completed in 18 months
    c) In children below 10 year, drug dose depends on body weight
    d) MB-MDT may be given for more than 12 months if BI is high

24. All of the following are true about MDT for Leprosy except:
    a) It reduces the transmission of disease to others
    b) Reduces chances of drug resistance
    c) Treatment duration is short and fixed
    d) It has no side-effects

25. As per NLEP Guidelines, which of the following is defined as a case of relapse:
    a) Incompletely treated previously, now presenting with new lesions
    b) Patient who fails to complete the treatment with in maximally allowed time
    c) Patient referred from one health centre after first dose of MDT
    d) Patient who has developed new lesions at any time after the completion of a full course of treatment

26. As per NLEP Guidelines, which of the following is defined as a defaulter:
    a) Incompletely treated previously, now presenting with new lesions
    b) Patient who fails to complete the treatment with in maximally allowed time
    c) Patient referred from one health centre after first dose of MDT
    d) Patient who has developed new lesions at any time after the completion of a full course of treatment

27. To record a patient for MDT as an indigenous case, he must have resided at the place of diagnosis for at least:
    a) 3 months
    b) 6 months
    c) 12 months
    d) 18 months

28. If a patient of Leprosy is co-infected with tuberculosis, which of the following is done:
    a) No change required in therapy
    b) Dose of rifampicin to be given as per tuberculosis.
    c) Dose of rifampicin to be given as per Leprosy
    d) Dapsone should not be given

29. In all of the following conditions, MDT may be safely given except :
    a) HIV positive patient
    b) Severe jaundice
    c) Pregnant woman
    d) Co-infection with tuberculosis

30. Which of the following conditions is a warning sign mandating stoppage of one or more of the MDT drugs in a patient of Leprosy:
    a) Jaundice and loss of appetite
    b) Flu-like illness

c) Reddish discoloration of urine
d) Dryness and flaking of skin over the shins

31. All of the following may be caused as a side-effect to dapsone except:
a) Hemolytic anaemia
b) Methaemoglobinemia
c) Jaundice
d) Skin pigmentation

32. A patient on MB-MDT developed brownish pigmentation and dryness of the skin. Which of the following statements regarding this is false:
a) It is due to clofazimine
b) Application of oil may be beneficial
c) The pigmentation is permanent and patient has to be counseled accordingly
d) The pigmentation is reversible

33. Accompanied MDT refers to:
a) Giving 2-drug treatment for12 months to PB as well as MB patients
b) Giving 3-drug treatment for 6 months to PB as well as MB patients
c) Issuing more than one blister pack for a patient from remote area
d) Restarting treatment for a relapse case

34. All of the following are criteria to restart MDT in a patient, except:
a) Persistence of sensory loss in skin patches despite treatment completion
b) Appearance of new lesions few months after treatment completion
c) Patient on PB-MDT, not taken treatment for more than 3 months
d) Patient on MB-MDT, not taken treatment for more than 6 months

35. Leprosy reaction can develop at anytime, at:
a) Onset of the disease/before starting the treatment
b) During treatment
c) After completion of the treatment
d) All of above

36. In a Leprosy patient, when can a lepra reaction occur:
a) Before starting treatment
b) During treatment
c) After completion of treatment
d) All of the above

37. Which of the following conditions predisposes to development of reaction or neuritis:
a) Multiple lesions
b) Lesions close to a peripheral nerve
c) Lesions over the face
d) All of the above

38. All of the following are common features of type 1 lepra reaction except:
a) Increased redness over previous lesions
b) Severe constitutional symptoms requiring hospitalization

c) Painful and tender, enlarged nerves
d) Swelling of hands and feet

39. Which type of hypersensitivity (Gell & Coomb's) reaction has been implicated in causation of type 2 lepra reaction:
a) Type I
b) Type II
c) Type III
d) Type IV

40. All of the following are features of ENL (erythema nodosum leprosum) except:
a) Red painful tender nodules occurring in crops
b) Evanescent in nature
c) Preferentially affect scalp, axilla and groins
d) May sometimes ulcerate

41. The complications of type 2 lepra reaction include:
a) Iridocyclitis
b) Epididymo-orchitis
c) Glomerulonephritis
d) All of the above

42. All of the following features may be common to type 1 and type 2 lepra reactions except:
a) Occurrence in MB Leprosy
b) Appearance of new lesions
c) Neuritis
d) Systemic complications involving kidneys, bones etc.

43. A 30 year old male patient with BL Leprosy is started on MB-MDT. Within 4 weeks of treatment he comes back with high fever, malaise, multiple painful red nodules all over the body and shooting pains along right arm with tenderness of right ulnar nerve. All of the following are indicated in the management of this case except:
a) Temporary cessation of MB-MDT for few days
b) NSAIDs like aspirin and paracetamol
c) Oral prednisolone
d) Splinting to the right hand to give rest

44. What is the optimum starting dose of oral prednisolone for a patient with severe ENL:
a) 0.5 mg per kg body weight
b) 1.0 mg per kg body weight
c) 1.5 mg per kg body weight
d) 2.0 mg per kg body weight

45. Which of the following conditions may be contraindications for systemic steroid therapy:
a) Diabetes
b) Tuberculosis
c) Gastritis or peptic ulceration
d) All of the above

46. In an uncomplicated single episode of ENL, oral prednisolone therapy started at 40 mg per day should be tapered within:
    a) 4 weeks
    b) 8 weeks
    c) 12 weeks
    d) 20 weeks

47. Which of the following regarding oral prednisolone therapy is false:
    a) It should be taken empty stomach for better absorption
    b) It should not be stopped suddenly
    c) Treatment of any infection should be done before starting prednisolone
    d) High dose of clofazimine may be added for better control

48. Which of the following is true about Leprosy?
    a) It affects all organ systems and parts of the human body
    b) The status of the disease does not change during pregnancy and perinatal period
    c) Leprosy is aggravated and progresses more rapidly in HIV +ve patients
    d) Most of the exposed population develop an effective immunity and do not develop disease

49. Leprosy infection usually occurs like this:
    a) From mother to child, vertically
    b) Amongst close family members by direct contact between skin
    c) Sexually transmitted
    d) Droplet borne respiratory infection
    e) Vector borne, through insect/animal bites

50. M. leprae travels to its site of predilection by:
    a) By lymphatics (in lymph)
    b) Through blood vessels
    c) In macrophages (through tissue matrix)
    d) All of the above

51. Which of the following is not true about Leprosy?
    a) It evokes variable immune response in each patient
    b) The clinical picture in each patient varies according to the immune response
    c) M. leprae multiplies more rapidly in the cooler parts of the patient's body
    d) Clinical manifestations vary depending upon the infecting bacterial load

52. The following are true about Sensory loss in Leprosy except:
    a) Limited to skin patches in PB type
    b) Partial/incomplete over early MB lesions
    c) Is always complete/total over skin lesions in PB Leprosy
    d) Extends into areas without clear cut patches in MB

53. At the end of adequate and regular MDT, all are true about outcome except:
    a) Reversal of skin pigmentation occurs over the next few months
    b) Reversal of sensory loss may be partial or complete

c) Deformities and disabilities takes a long time to improve
d) Partial recovery of motor loss may occur

54. After staining with steaming Strong Carbol Fuchsin, M. leprae resist decolorization by all except:
a) Sulphuric Acid 20%
b) Hydrochloric Acid (Hcl) 1%
c) Absolute alcohol
d) 1% Hcl in 70 % ethanol

55. Diagnosis of Leprosy can be confirmed by all the following laboratory tests except:
a) Histopathology of nerve biopsy
b) Histopathology of skin biopsy
c) Nerve conduction/function studies
d) FNAC from skin/nerve lesions

56. Patients classified as "other" in the Leprosy register can be any of the following except:
a) Cases referred from another centre/state for completion of treatment
b) Patient diagnosed elsewhere but not offered treatment or registration
c) Cases classified earlier as PB and started on treatment but now proved MB after careful reassessment
d) Patient who did not complete treatment course prescribed earlier after registration elsewhere

57. Appropriate footwear includes all except:
a) Should fit well, neither too tight nor too loose
b) Should be one size larger
c) Should have broad front to accommodate claw toes
d) Should have adjustable strap on top and back that buckles securely

58. Principles of eye care to prevent Leprosy related visual loss includes all except:
a) Detection of early signs of worsening of vision
b) Protection of eyes from dryness, sun light and dust
c) Protection eyes from injury
d) Detection of irritation and injury or of involvement of ocular tissue in early stages

59. Appropriate footwear includes all except:
a) Hard outer surface of sole that is not penetrated by thorn/nail
b) Soft insole of micro-cellular rubber
c) Firmly nailed metatarsal bar obliquely 2.5 cm proximal to the metatarsal heads
d) Arch support and insole if required

Self Assessment

Key to Questionnaire

Pre/Post test Questionnaire

1) YYNNY	2) NNNYN	3) YNNNY	4) YNYNN	5) YYYYN	6) NNNNY
7) YYNYY	8) 1–4, 2–5, 3–1, 4–3, 5–2		9) 1–2, 2–4, 3–1, 4–5, 5–3		10) NNNYY

Additional Questions

1) a	2) c	3) a	4) b	5) d	6) a	7) b	8) a	9) d	10) a	11) c	12) d
13) d	14) a	15) a	16) c	17) c	18) b	19) c	20) a	21) c	22) b	23) a	24) d
25) d	26) b	27) b	28) b	29) b	30) a	31) d	32) c	33) c	34) a	35) d	35) d
36) d	37) d	38) b	39) c	40) c	41) d	42) d	43) a	44) b	45) d	46) d	47) a
48) d	49) d	50) d	51) d	52) c	53) c	54) a	55) c	56) b	57) d	58) a	59) c