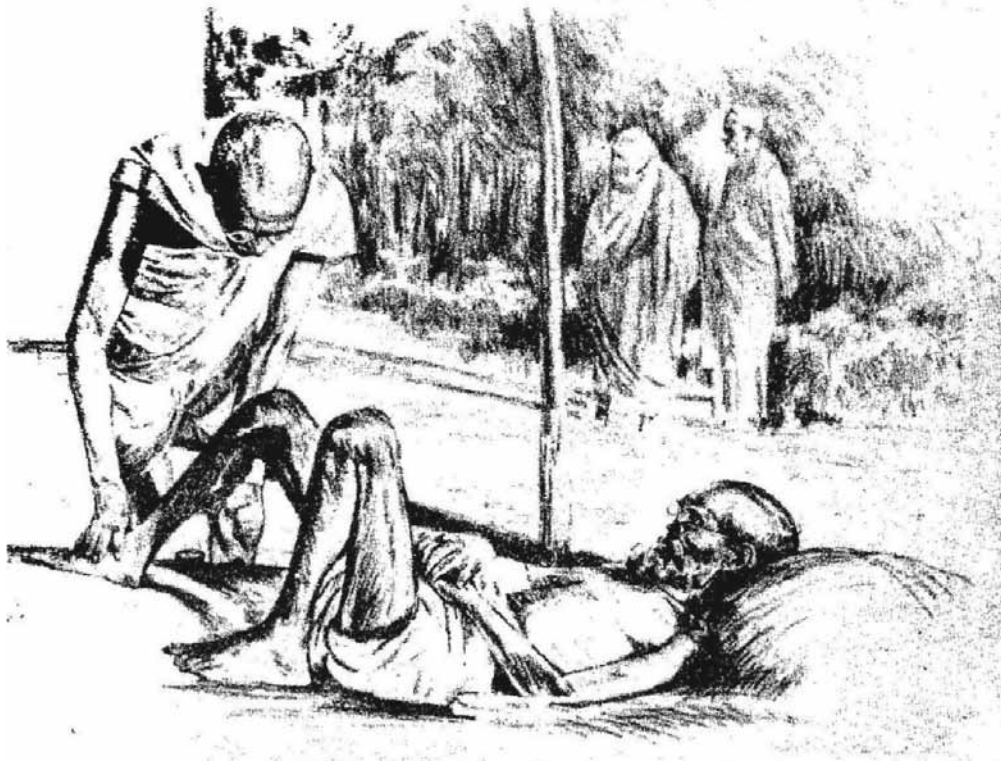

National Leprosy Eradication Program

Disability Prevention & Medical Rehabilitation

**Guidelines for
Primary, Secondary and Tertiary Level Care**

Central Leprosy Division
Directorate General of Health Services,
Ministry of Health & Family Welfare,
Government of India
Nirman Bhavan, New Delhi



Mahatma Gandhi nursing Parchure Shashtri, the great Sanskrit scholar who suffered from leprosy

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FOREWORD

Leprosy is one disease that has been causing devastating effect on the sufferers and their families since ancient days. Nerve damage caused by Leprosy which leads to the disability in persons affected is the main cause of concern.

The Govt of India decided to bring the Disability Prevention and Medical Rehabilitation (DPMR) as one of the major component of the National Leprosy Eradication Programme (NLEP) during the 11th Plan Period. DPMR plan was circulated in the year 2006 and Guidelines were prepared and circulated in the year 2007. Implementation of the programme in an integrated system along with support from the erstwhile Leprosy Institutions was encouraged. The Govt. has also encouraged the Physical Medicine & Rehabilitation (PMR) institutions involved in DPMR activities under NLEP.

I am very happy to learn that the Central Leprosy Division of Directorate General of Health Services (Ministry of Health and Family Welfare), Gol in collaboration with the WHO, ILEP, Novartis and other organizations deemed necessary to review the implementation of DPMR guidelines, before the 12th Plan is finalized and decided to bring out this updated and abridged version. I am sure that the Operational Guidelines will be very useful for all those involved in DPMR activities at Primary, Secondary & Tertiary level in their efforts to reduce visible disability due to leprosy in the coming years.

Dr. Jagdish Prasad

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दिनांक/Dated.....

PREFACE

After achieving the goal of Leprosy Elimination at National Level as a Public Health Problem in December 2005, the intervention measures are being continued for further reducing the disease burden in the country. With the gradual reduction of case load, the programme expanded its activities towards Prevention of disability and care for those already disabled. Disability Prevention and Medical Rehabilitation (DPMR) Guidelines were developed in consultation with the experts in leprosy and circulated in the year 2007.

Implementation of these guidelines along with utilisation of funds sanctioned for incentives to facilitate Reconstructive Surgery was a gigantic task. Capacity building of the Medical Officers and Staff at PHCs/CHCs, Dermatologist, Physiotherapist and Medical Specialist in the District Hospitals, were lengthy procedures, which could be accomplished through continuous support from the ILEP and other partner organisations. Inclusion of Govt. Medical Colleges and PMR institutions also helped in the DPMR achievements. Now that the system has been established, it is felt that the activities can be further streamlined, so that the quality of the DPMR services as well as the coverage, go much higher. After careful deliberation in a workshop held in June 2011, it was decided to revise and modify the existing Operational Guidelines meant for Primary, Secondary and Tertiary Levels and bring out a comprehensive volume of guidelines, for better coordination at all levels.

The continuous guidance and encouragement provided by Dr. Jagdish Prasad, Director General Health Services was of immense help to prepare the DPMR Guidelines.

I would like to gratefully acknowledge the contribution of all the experts and organizations especially WHO, ILEP, Novartis, who helped in bringing out the comprehensive Operational Guidelines for DPMR.


(Dr. C.M. Agrawal)





Novartis has been in the forefront of the fight against leprosy and has a long-term commitment to leprosy treatment and control that goes back 25 years. Since 2000, Novartis has donated more than 48 million multi-drug therapy blister packs through the World Health Organisation, helping cure over 5 million leprosy patients all over the world. India, with the highest case load, is the largest beneficiary.

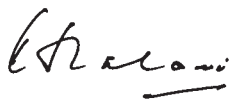
Leprosy continues to attract stigma due to the ensuing disability that follows delayed treatment and Novartis has been advocating the cause of these patients through several initiatives in India and elsewhere. India is home to nearly half a million disabled persons afflicted with leprosy. For over two decades now, the Novartis Comprehensive Leprosy Care Association had been actively involved in developing innovative, affordable and sustainable solutions for the problems that affect persons suffering from leprosy. Among these are specially prefabricated splints, self-care kits and grip-aids that play a contributory role in restoring independence. Reconstructive surgery plays a major role in reinstating the dignity of people impacted by leprosy and minimizing the stigma.

Reaching disability prevention and medical rehabilitation to those in need calls for defining the roles and responsibilities of people at all levels of healthcare. The publication of this book on Disability Prevention and Medical Rehabilitation Guidelines is an attempt towards this. We at Novartis feel humbled that Dr Atul Shah, Director, Novartis Comprehensive Leprosy Care Association, was selected as member of the Committee responsible for revising the guidelines.

I would like to thank the Government of India on behalf of all of us at Novartis, the Novartis Foundation for Sustainable Development and the Novartis Comprehensive Leprosy Care Association for recognizing our role in the fight against leprosy and for giving us the opportunity to publish these guidelines as our contribution in the efforts to eradicate leprosy through the National Leprosy Eradication Program (NLEP).

It will always be our endeavor to work jointly with the Government to remove the social stigma associated with this disease.

All good wishes



Ranjit Shahani

June 2012

Introduction

National Leprosy Eradication Programme (NLEP) is implemented with major objectives of reducing the disease burden, preventing disabilities and to improve awareness about leprosy in the country through general health care system.

Multi Drug Therapy is still considered as most potent drug regimen to reduce the burden of leprosy by interrupting transmission of disease and curing all registered cases of leprosy and making them released from treatment within shortest possible time. India has achieved the milestone of leprosy elimination since Dec. 2005 with wider use of MDT. But still a considerable numbers of new cases are being detected every year with disability and deformity. There also exists large number of cases who have completed the full course of MDT but have got different types of deformities and disability due to consequences of permanent nerve damage. Amongst the leprosy cured there are some of them though presently do not have any deformity but may develop same due to negligence in taking care of their anesthetic eye, hand or feet. As now the vertical program has been integrated into general health care system, it has become the responsibility of general health care system not only to ensure early case detection and provide regular MDT but also carry out all the activities required to prevent disability and provide medical rehabilitative services to patients who require those.

Presently the leprosy services like diagnosis & multi drug therapy, drug procurement and simplified information system have been well established in general health care system starting from sub center to district HQ hospitals and tertiary health care institutions. The disability prevention and medical rehabilitation services are comprehensive care to be provided to all old and new disability cases of leprosy so that they will not worsen their condition. It is estimated that around one million leprosy patients with disabilities exist in the country. There will be an average of 2000 to 3000 cured leprosy patients with disabilities living in a district. To institute care for individual leprosy patients with disabilities, it is essential to identify each patient having disability / deformity due to leprosy and motivate them to avail services at nearest CHC. Block CHC will be identified as first referral center for provision of DPMR services.

It is felt that prevention of deformities and disabilities need to be given higher emphasis during the 12th Five Year Plan period (2012-2017).

NLEP Mile-stones

- 1952
Dr. Wardekar's SET pattern for Survey Education and Treatment
- 1955
National Leprosy Control Program launched
- 1981
MDT (multidrug therapy) recommended by World Health Organisation as cure
- 1983
National Leprosy Eradication Program launched
- 1991
World Health Assembly adopts resolution to eliminate leprosy by the year 2000. Elimination was defined by WHO as prevalence of less than 1 per 10,000 population
- 1993
World Bank assisted the NLEP
- 2004
Leprosy integrated with GHS (general Health Service)
- 2005
Leprosy 'elimination' achieved at the National level in India
- 2006
DPMR introduced as a component of NLEP
- 2007
Disability Prevention & Medical Rehabilitation Guidelines for primary, secondary and tertiary level distributed by NLEP
- 2011
Guidelines on DPMR for NLEP revised

New Goal by WHO

To decrease the rate of disabilities in new cases among 10 lacs population by 35% with compare to the base line of 2010.

New Indicator

To decrease the visible disabilities to less than 1 per 10,000,00 population in the community by 2020.

The DPMR activities are planned to be carried out in a three-tier system i.e. the Primary level care (First level), Secondary level care (Second level) and the Tertiary level care institutions (Third level). The Primary level care are going to be started from village or community level to Community Health Center (CHC) level in rural areas, Sub-Divisional Hospitals and Urban Leprosy Centers /dispensaries in the urban areas. DPMR OPD/ clinic will be established at CHC and sub-divisional hospitals by trained leprosy paramedical worker under the guidance of MO in charge. OPD/clinic will function daily during the normal OPD timing within the premises of health institution. Secondary level care centers include district hospitals and district nucleus team. At some places secondary level care is available in the NGO supported leprosy units. The tertiary level refers to few centers of excellence where complicated cases can be referred from primary or secondary level. Besides, tertiary care for management of deformities is available at medical colleges and RCS centers recognized by Government of India.

It is important to remember that the important factor for continuing stigma is the deformities. It is not necessary that disability means patient has visible deformity for example inability to feel hot and cold due to anesthesia is a disability without any visible deformity. In the same way medical fraternity believes any therapy whether medical or surgical which is able to prevent the occurrence of disability or recovery in sensation or motor power is termed as 'Disability prevention'. However, general health services in broad definition of POD, also includes measures to prevent the worsening of existing disability or deformity and prevention of secondary impairments like joint contractures in claw hand or ulcer occurring in an anesthetic foot. Thus, offering MCR (microcellular footwear) is considered a modality for disability prevention. Care at all levels needs to look at not only healing of the ulcer but also prevent recurrence.

These operational guidelines which follow are expected to guide different health personnel, community level functionaries, people affected with leprosy (PAL) and also tertiary care institutions to play their role in disability prevention, correction and care for all leprosy affected persons.

CLINICAL ASPECTS

Confirmation of diagnosis

Majority of leprosy cases can be diagnosed clinically by eliciting cardinal signs of leprosy. However, some cases of leprosy do not manifest with visible skin patches or nodules but present with changes in the skin like redness, swelling and mild thickening of skin. Such cases with infiltration of the skin are generally multi-bacillary with positive skin smears. They represent what is called as the 'leprosy of consequence' as they transmit the disease before adequate treatment is initiated. In such cases slit skin smear examination will help in confirmation of diagnosis. On the other hand some of the cases of leprosy manifest with thickening or enlargement of peripheral nerves with sensory or motor impairment along the course of affected nerves. Careful sensory motor testing in the area supplied by the thickened nerve will help in confirmation of the diagnosis. Sometimes, electrophysiological studies or nerve biopsy may be indicated to rule out other causes.

In cases presenting with planter ulcer, anaesthesia without any other evidence of leprosy must be examined carefully with detailed history and investigations for spinal lesions like meningomyelocoele in childhood or spina bifida etc. Similarly, in cases presenting with deformities without nerve thickening or not definite sensory loss, differential diagnosis will need to be carried out with other conditions like trauma, other type of palsy etc. in mind. Definite confirmation of leprosy may need Nerve Conduction Study, skin or nerve biopsy and PCR technique to detect leprosy infection in certain difficult to diagnose cases.

Sometimes hypo-pigmented lesions on face and no enlarged nerves (indeterminate leprosy) especially in children with no definite loss of sensation are referred for confirmation; such cases may be kept under observation and treated with antifungal ointment or vitamin deficiencies meanwhile. However, if there are suspicious signs such as nodules or swelling on the face or earlobes, redness or infiltration in the patch, it is important to do a skin smear to confirm the diagnosis of leprosy. The positive report will establish the diagnosis while a negative report in the absence of other cardinal signs would rule out leprosy. Enlargement of cutaneous nerves like great auricular nerve, supraorbital or supratrochlear nerves may also help clinician to diagnose leprosy in patient having facial lesion. When in doubt, histopathological examination of lesion will help in establishing alternative diagnosis.

Cardinal Signs of Leprosy

- *Anesthetic patch*
- *Skin smear +*
- *Thickened peripheral nerves*

Doubtful leprosy case

Clinical examination
Elicit cardinal signs of leprosy

Skin smears

If patch - skin biopsy from the patch

Nerve conduction velocity
If nerve thickening - nerve biopsy from the radial cutaneous or sural nerve and ask for nerve staining result, electron microscopy and PCR

Aspiration cytology of nodules and lymph glands if any

Some Differential Diagnosis

Vitiligo
Tinea Versicolor
Pityriasis Alba
Nutritional dyschromia
Herpes Zoster
Lupus Vulgaris
Granuloma annulare
Psoriasis
Post-Kalaazar Dermal Leishmaniasis
Neurofibromatosis

Skin smear examination

Material required:

- Sink with running tap water
- 1% carbol fuchsin solution
- Pipette
- 1% acid-alcohol
- Staining rods
- 0.2% methylene blue solution
- Slide rack
- Spirit lamp
- Tissue paper
- Clock or watch
- Gloves

Skin smear examination is essentially three steps; first is the collection of the specimen, second is the staining of the slide and third is the microscopic examination of the material. Reasonably accurate report is obtained in terms of positivity if proper technique is followed. In this section it is our endeavour to retain the skin smear examination technique alive at the secondary and tertiary care centers since it has largely been discontinued in the field area situation. Thus, onus of accurate reporting falls on the secondary and tertiary care level personnel.

Step 1: Collection of the specimen

Note: Before taking each smear wash hands and put on gloves.

Preparation of slide

Take a new, clean, unscratched microscope slide. Using a slide marker, write the patient identification (ID) number at the bottom of the slide. This number must be on the request form.

Collection of smear

Clean the skin at the smear sites with a cotton wad drenched in alcohol or spirit. Allow it to dry. Light the spirit burner. Put a new blade on the scalpel handle. If you put the scalpel down, make sure the blade does not touch anything. Pinch the skin firmly between your thumb and forefinger; maintain pressure to press out the blood.

Make an incision in the skin about 5 mm long and 2 mm deep. Keep on pinching to make sure the cut remains bloodless. If bleeding, wipe the blood with cotton wad. Turn the scalpel 90 degrees and hold it at a right angle to the cut. Scrape inside the cut once or twice with the side of the scalpel, to collect tissue fluid and pulp. There should be no blood in the specimen, as this may interfere with staining and reading. Stop pinching the skin and absorb any bleeding with a wad of cotton. Seal the cut site with Tr. Benzoin

Spread the material scraped from the incision onto the slide, on the same side as the ID number. Spread it evenly with the flat of the scalpel, making a circle 8 mm in diameter. Rub the scalpel with a cotton wad drenched in alcohol. Pass the blade through the flame of the spirit burner for 3 to 4 seconds. Let it cool without touching anything. Repeat the steps above for the second site. Spread this smear next to, but not touching, the first one. Discard the scalpel blade safely. Thank the patient.

Fixation of smear on slide

Let the slide dry for 15 minutes at room temperature, but not in direct sunlight. Fix the smears by passing the slide, with the smears upwards, slowly through the flame of a spirit burner, 3 times. Do not overheat. The slide should not be too hot to touch. Put the slide in a slide box & send to the laboratory with the skin smear request form.

Step 2: Staining the smear (Ziel-Neilson Technique)

Filter the 1% carbol fuchsin solution through ordinary filter paper. Cover the whole slide with 1% carbol fuchsin solution. Heat the slide gently by holding a burning spirit lamp underneath it until vapour begins to rise from the carbol fuchsin. Repeat this 3 times during a period of 5 minutes. Make sure the stain does not boil. If the stain dries, add some more reagent and heat again. Wash gently under a running tap. Rinse until the run-off water is colourless, although the smears will remain dark red. Register the slide in the lab register.

Put the slide on the staining rack with the smeared side upwards. Up to 10 slides can be stained together. Make sure that the slides do not touch one another.

Decolorising:

Cover the smear with 1% acid-alcohol for 10 seconds. An alternative method is to cover with 5% sulphuric acid for 10 minutes. Rinse gently with water.

Counter-Staining:

Cover with 0.2% methylene blue for 1 minute. Rinse with water, and let the slide dry in the drying rack in an inclined position, with the smeared side downwards. The slide is now ready to be read.

Step 3: Microscopic Examination

Look for the presence of acid-fast bacilli under oil immersion lens. They appear as fine red rods against a blue background. They can be straight or curved, and the red colour can be uniformly distributed (solid bacilli) or unevenly distributed (fragmented and granulated bacilli). Clumps of bacilli are called globi. Solid bacilli may suggest the presence of viable organisms and may be seen in new, untreated cases or in relapse cases. After examining the first field, move to the next field. Examine approximately 100 fields per smear.

Bacteriological Index (BI)

0, No bacilli seen in 100 fields

1+, 1 to 10 bacilli in 100 fields

2+, 1 to 10 bacilli in 10 fields

3+, 1 to 10 bacilli, in each field

4+, 10 to 100 bacilli, in each field

5+, 100 to 1000 bacilli, in each field

6+,>1000 bacilli, in each field

Microscopic Examination Procedure

- *Put the slide under the microscope with the smears upwards and the ID number to the left.*
- *Focus the image using the 10x objective.*
- *Put a drop of immersion oil on the smear.*
- *Switch to the 100x objective to touch the immersion oil (if necessary, move the coarse adjustment screw to make sure that oil immersion lens touches the oil).*
- *Open the diaphragm completely and raise the condenser to its highest position.*
- *Focus precisely with the fine adjustment screw.*

Note on reading the skin smears

You need a microscope with a 10x eye piece and 10x and 100x objectives. Start the examination using the 10x objective. If acid-fast bacilli are seen, quantify them according to the following scale for the Bacteriological Index (BI). Calculate the BI for each smear separately. The bacilli may be in the following forms solids, globi, fragmented & granular. Write the result of both smears in the lab register. Give the result in the referral slips. Report the BI for both smears on the slide. For smear positive patients, the average BI will be taken as the BI for that patient.

Rinse the slide in xylene. Do not wipe it. Store the slide in a slide box for future quality control. Slides that are not kept for quality control should be destroyed, or disinfected, boiled and washed for re-use in routine examinations (of stool or urine, for example). Slides should not be re-used for other skin smears or for sputum examinations.

Histopathology of skin or nerve biopsy

Some cases may need investigations to confirm the diagnosis of leprosy or confirmation of relapse. Punch (5 mm) biopsy or incision biopsy for histopathological examination may help in reaching the conclusion if analyzed along with clinical criteria. Specimen is taken from just inside the edge of the lesion / cutaneous branch of peripheral nerve under suspected lesion and processed.

The common nerve for biopsy includes the index branch of radial cutaneous nerve and sural nerve unless any other superficial sensory nerve is affected. It is examined under microscope after proper staining with Fite Faracco stain. Presence of lepra bacilli in or around the nerve is diagnostic, but only granuloma or infiltration without support of clinical signs may mislead. It is probably advisable to give preference to the clinical presentation over the histological picture if the two are at variance, a situation that is not uncommon. Fine Needle Aspiration Cytology (FNAC) from the lymph glands is usually helpful if patient is in suspected lepra reaction type 2.

Radiological examinations

X-rays are helpful in diagnosing osteoporosis, fractures of small bones, absorption of bones, sequestra. Ultrasonography of nerve trunks or internal organs e.g. testes, reticulo-endothelial organs may help in judging the diagnosis and prognosis of complicated cases.

Treatment

The standard adult treatment regimen for MB leprosy is:

Rifampicin.....600 mg once a month
Clofazimine.....300 mg once a month, and 50 mg daily
Dapsone.....100 mg daily
Duration : 12 months (12 blister packs)

The standard adult treatment regimen for PB leprosy is:

Rifampicin.....600 mg once a month
Dapsone.....100 mg daily
Duration : 6 months (6 blister packs)

The standard child (ages 10 - 14) treatment regimen for MB leprosy is:

Rifampicin.....450 mg once a month
Clofazimine.....150 mg once a month, and 50 mg every other day
Dapsone.....50 mg daily
Duration : 12 months (12 blister packs)

The standard child (ages 10 - 14) treatment regimen for PB leprosy is:

Rifampicin.....450 mg once a month
Dapsone.....50 mg daily
Duration : six months (six blister packs)

The appropriate dose for children under 10 years of age can be decided on the basis of body weight. [Rifampicin: 10 mg per kilogram body weight, clofazimine: 1 mg per kilogram per body weight daily and 6 mg per kilogram monthly, dapsone: 2 mg per kilogram body weight daily. The standard child blister pack may be broken up so that the appropriate dose is given to children under 10 years of age. Clofazimine can be spaced out as required.]

Rarely, it may be considered advisable to treat a patient with a high bacillary index (BI) for more than 12 months. This decision may only be taken by specialists at referral unit after careful consideration of the clinical and bacteriological evidence.

Treatment of complicated cases

Treatment

Type of Leprosy	Paucibacillary	Multibacillary
Number of lesions / nerve trunk affected	1-5 / 1	>5 / >1
BI according to the Ridley scale	Negative	Positive
Regimen	Daily: Dapsone 100 mg Once monthly supervised: Rifampicin 600 mg	Daily: Dapsone 100 mg Once monthly supervised: Rifampicin 600 mg Clofazimine Lamprene 300 mg
Duration of treatment	6 blister packs	12 blister packs

Adverse reactions to MDT

MDT is remarkably safe and serious adverse effects are very rare. Generally the following problems are seen with MDT.

Minor problems	Drug	Management
Red urine	Rifampicin	Reassurance
Brown discoloration of the skin	Clofazimine	Counseling
Gastro-intestinal upset	All three	Give drugs with food
Anaemia	Dapsone	Give iron and folic acid

More serious problems	Drug	Management
Itchy skin, rash, Steven Jhonson Syndrome	Dapsone	Stop the drugs and consider alternative regimen
Allergy, urticaria	Dapsone or Rifampicin	
Jaundice	Rifampicin	
Shock, purpura, renal failure	Rifampicin	

Dapsone poisoning

Case should be hospitalized, gastric lavage is done and oxygen is started. Vital functions are assessed, if there is need 1% Methylene blue is given in doses of 2 mg per kg body weight. Activated Charcoal 25 mg 8 hrly is given orally. Ascorbic acid 500 mg hrly may be added. Detailed clinical assessment is required frequently. Laboratory aids maybe asked to assess Hepato-renal functions.

Side effects of steroid therapy

Common side effect of steroid is “moon face” (secondary Cushingoid Syndrome) which disappear with decreasing/stopping steroids.

Gastric ulcer, secondary infections, fungal infections, osteoporosis, secondary cataract or any other complication of Prednisolone therapy should be managed without delay.

Internal medical conditions

Chronic untreated leprosy (fortunately no longer seen) and chronic ENL reactions (still a serious complication in a small proportion of patients) may lead to internal medical complications. Such patients need referral to the appropriate specialists.

Psycho-social problems

Psycho-social problems are related to widely-held beliefs and prejudices concerning leprosy and its underlying causes, not just to the problem of disability. People with leprosy often develop self-stigma, low self-esteem and depression, as a result of rejection and hostility of family and community members. Such negative attitudes are found also among staff in the health services, including doctors. These need to be addressed with counseling. People with psycho-social problems may also need to be referred for counseling or other help.

Reactions in Leprosy

There are two types of reactions – Reversal Reaction (or Type 1) and Erythema Nodosum Leprosum (ENL or Type 2). Both the types of reactions can occur before the start of treatment, during treatment, or after the treatment has been completed. Both types can be divided into mild or severe. If the peripheral nerves or eyes are affected the reaction is to be considered severe.

Leprosy reactions are usually diagnosed by clinical examination only; however few patients may require further investigations. Inflammatory changes in skin lesions or appearance of new lesions, patches or nodules with acute onset, draw the attention of the patient to report. Some cases develop signs of nerve damage (neuritis) without the obvious changes in skin lesions. Occasionally some cases may develop silent neuritis or quiet nerve paralysis which needs to be managed with care and follow up with proper sensory motor records.

Differentiating features of two types of reactions

Distinguishing between the two types of reactions is usually not difficult. In reversal reaction, the leprosy skin lesion themselves become inflamed, red and swollen whereas, in an ENL reaction, crops of subcutaneous tender nodules, usually symmetrical (about 1 - 2 cm across) appear under the skin of the limbs or trunk, while the original leprosy skin patches remain as they were. ENL reactions cause a general feeling of fever and malaise, while reversal reactions cause less systemic upset. The common differentiating features are given in the table below.

Type 1 (Reversal Reaction)	Type II (ENL)
1. Delayed hypersensitivity	1. Antigen antibody reaction
2. Occurs in both PB and MB type of cases (Borderline group) i.e. in unstable types like BT.BB.BL.	2. Seen in MB cases only (BL & LL type)
3. Skin lesions suddenly become reddish, swollen, warm, painful, and tender. New lesions may appear.	3. Red, painful, tender, sub cutaneous nodules (deep) ENL may appear commonly on face, arms, legs, bilateral symmetrically. They appear in groups and subside within few days even without treatment (Evanescent skin nodules). Nodules are better felt than seen and these are recurrent (episodic)
4. 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 or rapidly.	4. Nerves may be affected but not as common or severe as in Type 1
5. Other organs - Not affected	5. Other organs like eyes, testis, and kidneys may be affected
6. General symptoms - Not common	6. Fever, joints pain, red eyes with watering

Signs of a Reversal Reaction

If any of the following sign is found, the reaction should be treated as severe:

- Loss of nerve function i.e. loss of sensation or muscle weakness.
- Pain or tenderness in one or more nerves.
- Silent neuritis.
- Marked swelling & redness in skin patches. A red, swollen patch on the face, or overlying another major nerve trunk.
- A skin lesion anywhere that remains ulcerated.
- Marked oedema of the hands, feet or face.

Severe reversal reactions should be treated with a course of steroids, usually lasting 3 – 6 months. There are a number of important side-effects associated with steroids, so a careful assessment must be made of any patient who requires them.

Signs of an ENL reaction

If any of the following signs is found, the reaction should be treated as severe:

- Pain or tenderness in one or more nerves, with or without loss of nerve function
- Ulceration of ENL nodules
- Pain and/or redness of the eyes, with or without loss of visual acuity
- Painful swelling of testis or of the fingers
- Marked arthritis or lymphadenitis

ENL reactions are complex medical problems requiring careful management by experienced clinicians. Short course of steroid are often used to deal with these reactions, but other drugs are also useful.

Treatment of ENL

It includes Prednisolone, bed rest, and rest to the affected nerves by splint and analgesics. For **neuritis**, treatment with Prednisolone should be prolonged to four weeks from 20 mg onwards.

Prednisolone tablets given should be entered in the 'Prednisolone Card'. Tapering of Prednisolone may be done according to its response. Its intake on empty stomach and salt restricted diet during its course should be insisted upon to minimise the side effects. Any adverse effect or complication such as malena, gastric ulcer, secondary infection in ulcer or lungs, fungal infection in body folds should be detected & treated as early as possible.

Added Clofazimine for Type 2 reactions may be extremely useful for reducing or withdrawing corticosteroids in patients who have become dependent on them; though it is less potent than steroids and often takes 4-6 weeks to develop its full effect. Total duration of Clofazimine therapy should not exceed 12 months.

Cases of lepra reaction, where Prednisolone is contraindicated or ineffective may be put on alternative drugs such as Thalidomide. It is an effective drug in the treatment of severe ENL in leprosy. It has serious teratogenic risks. The risks of teratogenic effects must be balanced against the benefits of Thalidomide in treating severe, disabling and potential life threatening ENL. Thalidomide should be considered for the treatment of severe ENL reaction at tertiary level only when the use of steroids is contraindicated or non-effective. Each patient selected for thalidomide therapy should give an informed consent after explanation of all the risks and benefits. Thalidomide is started at 200 mg twice daily or 100 mg four times daily and ENL is usually controlled within 72 hours and the dose can then gradually be tapered off. Maintenance dose of 50-100 mg daily may be required for prolonged period in some cases. Thalidomide must be administered under the strictest possible supervision.

If a patient develops lepra reaction during the treatment, do not stop MDT (rather complete the course of MDT). Lepra reactions, which occur after completion of treatment, should also be managed as mentioned earlier. MDT should not be restarted for such cases.

Prednisolone is given in the following regime

- *Start tablet prednisolone (dose at 1mg / kg body wt / day) is given as a single morning dose after breakfast (consider giving tab ranitidine 150 mg along with prednisolone).*
- *After the reaction / inflammation is controlled, prednisolone is tapered by 10 mg, fortnightly till the dose of 20 mg / day.*
- *Thereafter prednisolone is tapered by 5 mg / day, fortnightly till withdrawal.*

Clofazimine is given in the following regime

- *One capsule (100 mg) 3 times a day x 4 or more weeks (depending on the response) then*
- *One capsule (100 mg) 2 times a day x next 4 - 12 weeks, followed by*
- *One capsule (100 mg) once a day x next 4 - 12 weeks or more*

Steroid therapy – precautions

There are many side effects of steroids. Advise everyone receiving steroids that the drugs may have side effects, and advise them to report any unusual symptoms to their health worker as soon as possible, so that further complications can be prevented.

Follow-up after treatment with steroids

People who have been given a course of steroids for reaction or nerve damage should be followed up closely because of the risk of recurrence. Each person must understand that a reaction or new nerve damage may recur. They must know to recognize the early signs of nerve damage and be aware of how important it is to return promptly to the clinic for treatment. These signs include pain or tingling sensations, further loss of feeling or loss of muscle strength and inability to close the eye.

People still on MDT should have their nerve function checked monthly by the health worker when they come to collect their treatment. Any deterioration should be noted and the person referred. People who have already completed MDT by the time they come to the end of a course of steroids should be asked to come back three months and six months after the end of the course for review and nerve function assessment.

People who still have lagophthalmos (weakness of eyelids) after completion of treatment with steroids should be considered for reconstructive surgery.

Groups requiring special precautions when prescribing steroids

The following groups of people require special precautions when steroids are required. One must not give steroids to people with tuberculosis, diabetes, deep ulcers, osteomyelitis, corneal ulcer or other serious conditions without starting treatment for the underlying condition.

Pregnant women

All pregnant women should be treated at referral level, so as to minimize the steroid dose they are given and thus avoid harmful effects, such as growth retardation, on the foetus. If steroids are given in the third trimester, this may cause adrenal suppression in the newborn infant; ideally, such infants should be monitored in a referral centre for a few days after birth. The doses of Prednisolone prescribed during pregnancy may be: In both PB and MB cases, start at 30 mg daily instead of 40 mg and limit the course to ten weeks rather than the normal twelve. In MB cases, starting at 30 mg daily but lasting for twenty weeks.

Children

To minimize the effects of steroids on their growth, children can be given a course similar to that for pregnant women, but the *starting dose of Prednisolone should not exceed 1 mg per kilogram of body weight per day*. If it can be arranged, giving children steroids on alternate days may reduce the effect on their growth. A suitable regimen for PB cases would be 30 mg of Prednisolone daily for two weeks, then 30 mg on alternate days for two weeks, with a gradually reducing dose over the total course of ten weeks. For MB cases, one should double the duration of each stage of the course.

Tuberculosis

If you suspect that a person has tuberculosis, the diagnosis must be confirmed and treatment started before giving steroids. A sputum specimen should be examined for acid-fast bacilli. If tuberculosis is diagnosed, Steroids can be started as soon as effective anti-TB treatment is begun; always follow the national guidelines for the diagnosis and treatment of tuberculosis.

Diabetes

People who show symptoms that suggest diabetes or whose urine tests positive for glucose should be referred to confirm whether the diagnosis is correct and, if it is, for management of the condition. Steroids may increase the diabetic's requirement for insulin.

A person taking steroids may also develop diabetes for the first time; this possibility must be considered when people develop typical symptoms of diabetes during treatment with steroids – these symptoms include excessive thirst, increased urination and fluid intake. If sugar is found in the urine, serial blood sugar examinations must be made, firstly to establish the diagnosis and then to monitor the response to treatment. Insulin may be required in the first instance, but the condition usually resolves itself when steroids are stopped.

Relapse

Relapse is defined as the re-occurrence of the disease at any time after the completion of a full course of treatment. MDT is a very effective treatment for leprosy. If a full course of treatment has been taken properly, relapse is generally rare. Relapse is indicated by the appearance of new skin lesions and, in the case of an MB relapse, by evidence on a skin smear of an increase in BI of 2 or more units. Fortunately, the use of a combination of drugs has prevented the development of drug resistance in leprosy, so relapse cases can be treated effectively with the same drug regimen – MDT. It is difficult to be certain that a relapse has occurred, as new lesions may appear in leprosy reactions also. A reaction may be treated with steroids, while a relapse will not be greatly affected by a course of steroids, so using steroids as a ‘therapeutic trial’ can clarify the diagnosis. Various criteria may help in distinguishing a relapse from a reaction:

Criteria	Relapse	Reaction
Time since completion of treatment	Usually more than 3 years	Usually less than 3 years
Progression of signs and symptoms	Slow	Fast
Site of skin lesions	In new places	Over old patches
Pain, tenderness or swelling	No	Yes - skin & nerves
Damage	Occurs slowly	Sudden onset
General condition	Not affected	

DPMR ASPECTS

Nomenclature and definitions

Anaesthesia / hypoaesthesia

It is the complete or partial impairment of sensation over the skin to touch, pain and temperature.

Impairment

It is the loss or abnormality of anatomical or physiological structure or function.

Deformity

Deformity is the visible alteration in the form, shape or appearance of the body due to impairment produced by the disease process.

Disability

It is any restriction or lack of ability (resulting from impairment) to perform an activity considered normal for a human being.

Handicap

Handicap is the disadvantage for a given individual resulting from an impairment or disability that limits or prevents fulfillment of a role that is normal depending on the patient's age and sex as well as relevant social and cultural factors.

De-habilitation

It is the progressive loss of social status and isolation from the society.

Destitution

It is the final stage of social isolation without food or shelter.

Management of Nerve Impairment

A patient may present with complaints such as loss of sensations or dryness or weakness in the limbs. He may also present with thickening of the nerve trunk without any symptom/sign or acute neuritis i.e. painful, tender and thickened one or more nerves or chronic neuritis where pain and tenderness is less prominent but damage to the nerve gradually increases to complete nerve destruction i.e. complete paralysis for more than one year (fibrosed nerve, “cord like” on palpation).

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.

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 and affects blinking of the eye. Hence, irregular/infrequent/absent blinking indicates involvement of trigeminal nerve.

Supraorbital and supratrochlear nerves

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

Facial nerve

Facial nerve is purely a motor nerve and supplies various muscles of the face including orbicularis oculi. *There is no sensation loss due to its involvement.* 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’ and has grave consequences leading to blindness.

Greater Auricular nerve

The nerve innervates skin of angle of the mandible and parotid area and can become visibly enlarged. 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. To palpate the nerve ask the person to turn head to opposite side so as to tighten the sternomastoid muscle. Nerve is seen crossing the upper third of the muscle lying parallel to the external jugular vein.

Examination of nerves of the upper limb

While examining the peripheral nerves look for the autonomic function of the nerve, dryness, crack, callosities, atrophy of muscles, deformities and any other secondary impairments like blisters or burns and ulcers.

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. Its affection causes sensory loss on palmar aspect of little finger and medial half of ring finger. The motor loss causes atrophy of hypothenar eminence, weakness in little finger in bringing it out or bent finger which is called clawing.

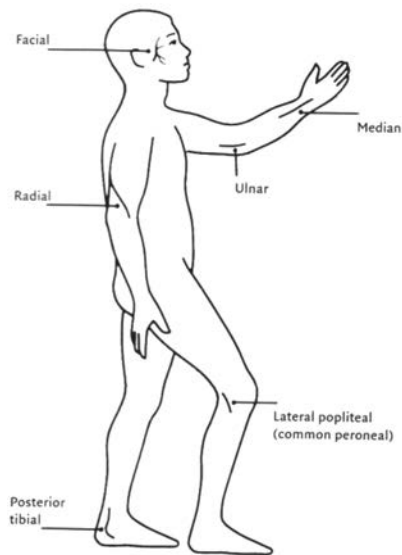
It can also be tested by asking the person to move the little finger sideways or out i.e. away from the other fingers in the same plane as palm and noting the resistance against your finger.

Long duration paralysis causes typical claw hand deformity, characterised by hyperextension at the metacarpophalangeal joint and flexion at the proximal interphalangeal joint.

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. Its affection cause **loss of sensations on the palmar aspect of lateral three and a half fingers** i.e. thumb, index, middle finger and lateral half of ring finger and corresponding part of the palm. The motor paralysis cause flattening of the thenar eminence and also clawing of index and middle finger and/or Ape thumb deformity in which thumb lie in the plane of the palm and cannot be abducted. Paralysis of the median nerve is usually associated with that of the ulnar nerve resulting in complete claw hand.

Radial nerve



Sites of nerve involvement

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 small part of the skin on the back of the hand. Superficial nerve is commonly affected in leprosy. Main trunk is only occasionally affected and is 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 lateral part of the wrist / back of the hand.

Radial nerve trunk supplies the muscle in the back of the forearm that extends the wrist, fingers and thumb. Person is unable to use the hand or extend the wrist, fingers and thumb. The high radial paralysis cause wrist drop deformity. It can be easily tested by asking patient to extend the wrist against resistance which he cannot do, followed by testing for the finger and thumb extension.

Nerves of the lower limb

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

Lateral popliteal nerve

The lateral popliteal nerve (a branch of common peroneal nerve) gets affected at the knee, precisely behind the neck of the fibula on the lateral aspect of the leg. 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. Later, it may cause foot drop deformity in which foot is unable to dorsiflex the ankle. Its sensory supply extends on the dorsum to 1st web space. This fact is taken advantage in the surgical aspect for designing the neurovascular island pedicle flap to resurface the ulcers in the 1st metatarsal

region. Voluntary Muscle Test (VMT) for each nerve to detect nerve damage at early stage is tabulated as below-

Facial nerve	Ask patient to close eyes lightly, as during sleep, & check for lid gap. A gap of + 1 mm may be normal. Record the gap in millimeters on the form. To test for early weakness, ask the patient to close the eyes tightly and try to separate the eyelid with your thumb and index finger. Do not use excessive force!
Ulnar nerve	Ask patient to abduct the little finger & apply resistance at the base of the little finger ("little finger out"). Record the strength.
Median nerve	Ask patient to hold the hand flat in a horizontal position and abduct the thumb (point upwards at 90 degrees "thumb up"). Resistance is applied at the head of the 1st Metacarpal towards the index finger. Wrist should be slightly extended.
Radial nerve	Ask patient to extend the wrist ("wrist up"). Apply assistance on the dorsum of hand.
Lateral popliteal nerve	Ask patient to lift the foot ("foot up"). Apply assistance on the dorsum of foot.

Posterior Tibial nerve

Posterior tibial nerve is palpable at a site just below and behind the medial malleolus, approximately at the midpoint between medial malleolus and heel. This nerve supplies the skin of the entire sole. Posterior tibial nerve involvement does not experience any noticeable disability in the early stages. Later it produces claw toes and plantar anaesthesia, a major cause of secondary disabilities like anesthetic foot with plantar ulcers. 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 can be tested.

The test to detect early muscle weakness

The muscle power of both hands and feet are categorized as: S = Strong, W = Weak and P = Paralysed

Cases with Grade – 0 disability who are at risk of developing disability are those who have thickened nerves, positive skin smear, impairment of vision, early nerve damage, skin lesions over / near trunk, puberty, pregnancy, on hormonal therapy.

The findings of the examination are first noted in the Disability Assessment Form (form P-II) by PMW separately for right and left eyes, hands and feet. Thereafter each eye, each hand and each foot is given its own grade.

Steroids, whether taken by mouth or locally applied, may make the eye conditions worse. Therefore, never use steroids unless prescribed by a medical doctor.

Eye involvement

People who have corneal damage or iritis (denoted by red eye, pain or photophobia) should be referred for specialist diagnosis and management at a centre properly equipped for eye care. Corneal ulcers and keratitis are inflammatory conditions of the cornea. They are often caused by exposure, as a result of the person being unable to close the eye properly: there is pain, redness and often some loss of vision. The treatment usually consists of local antibiotics, sometimes with a pad to keep the eye closed.

Iritis, uveitis, iridocyclitis and scleritis are all types of inflammation inside the eye and they can all 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. The treatment includes atropine eye ointment to prevent adhesion.

Lagophthalmos

The muscles which close the eye can become weak or paralyzed, if the facial nerve is damaged in a leprosy reaction. The result is that the eye cannot close properly. There may be watering of the eye. Sometimes there is loss of sensation in the cornea (the clear part at the front of the eye) also, which leads to loss of normal blinking.

In the early stages, lagophthalmos can be treated like any other case of neuritis, with steroids. When the condition is permanent, surgery to the eyelids may help to prevent corneal damage. Regular blinking and complete closure of the eyes at night keep the cornea healthy. In lagophthalmos, the cornea is at risk of damage which makes it less and less transparent. Blindness is a common end result. When there is such inability that on closure of the eyelid cornea remains exposed, it is considered as severe lagophthalmos threatening further damage and needs to be treated on urgent basis. Patient is taught forced closure in mild case and closure by pulling the lateral angle of the eyelid skin in severe cases. All people who are unable to close their eyes, or who do not blink should wear glasses.

Mild Lagophthalmos:

When asked to close eyes lightly the person has a slight gap (< 6 mm) between the eye lids. In such cases ask the person to try and close their eyes with force. If the face muscles are still strong enough, the person will be able to close the gap. They should keep the eye forced closed while counting to 10. They should do this exercise as often as possible every day.

Severe Lagophthalmos:

When asked to close eyes lightly the person has a large gap (> 6 mm) or sign of exposure Keratitis between the eye lids. In such cases, ask the person to try and close their eyes with force. Sometimes the face muscles are too weak to force the eyes closed. If the person still has a gap between the eye lids, they will need to do passive exercises to prevent the deformity from worsening and help keep the eye as healthy as possible. When eyes cannot be closed fully, the person should place their fingers at the outer corner of the eye and gently pull outwards until the eye closes. This exercise should be done to a count of 10 as often as possible through the day. All people who are unable to close their eyes, or who do not blink should wear glasses.

People who don't blink should develop the "think blink" habit. They should be encouraged to force themselves to blink whenever they see a common object, such as a tree, a cow or a motorcycle. If they carry out the exercise of "think and blink" for long enough, the action will become a habit.

Visual acuity

Check how well people can see by using a Snellen chart or by asking the person to count fingers at six meters distance. If there is recent visual loss in one or both eyes, so that the person cannot count fingers at six meters (visual acuity of < 6/60), they should be referred to an eye clinic. Cataracts are the most common cause of significant vision loss in the community and this is especially true in older people. People who have had leprosy can have their cataracts operated on in exactly the same way as those who have not had leprosy, with an intraocular lens implant.

Red eye

A much less common complication of leprosy is inflammation inside the eye itself. The main signs of inflammation are pain and redness of the eye. Conjunctivitis and corneal exposure cause redness of the eye: they can be treated in a general clinic with antibiotic eye ointment and an eye pad. However, if the redness persists after a few days of treatment the person should be referred to an eye clinic. Red eye during type 2 reaction / ENL indicates Iridocyclitis which needs referral to eye specialist. An eye that is persistently red may have exposure which needs surgical treatment or there may be inflammation inside the eye which requires special treatment beyond the scope of this book.

Corneal anaesthesia

When the cornea does not have sensation it is at risk of damage from objects like sand, insects or eyelashes. These can cause ulcers on the cornea. If the cornea (the clear front of the eye) has a white spot on it and the eye is red, a corneal ulcer should be suspected. In such cases the person should be referred to a specialist immediately. Corneal ulceration is an emergency. If it is not treated very quickly the person may become blind.

Assessment & Grading of Disability

Assessment of sensory function of nerve trunk

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 as well as in the foot. Impairment or absence of sensation at any of the point needs testing of the sensation at more points in that area to identify the exact extent of sensory loss.

Assessment of the motor function of nerve (VMT)

Check the active range of movement of joints. If the voluntary movement of the joint is reduced or absent, it means that the muscle is either weak or paralysed. 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 strong (normal), Weak (reduced) or absent (paralysed). 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.

Note: In order to remove any anomaly passively move the joints through normal range of movement to assess stiffness of the joints and/or development of contractures of weak/paralysed muscle.

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.

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 paralyzed (W/P)	
Feet				
	0	Sensation present	Muscle power normal (S)	
	1	Sensation absent	Muscle power normal (S)	
	2	Sensation absent	Muscle power weak or paralyzed (W/P)	
Eye		Vision	Lid Gap	Blinking
	0	Normal	No lid gap	Present
	2	Can not count fingers at 6 meters	Gap between eyelids present/red eye/corneal ulcer or opacity	Absent

World Health Organisation advocates simple disability grading assessment in to grade 0, 1 and 2, where grade 0 is no disability, grade 1 is anesthesia over palm and sole and deformity/visible disability is grade 2. While this may give an indication to the status on detection it does not measure the worsening or improvement by disability prevention and medical rehabilitation program longitudinally. Therefore, EHF score is used to grade the disability of the individual organ separately and to give an overall disability grade to the person as outlined below.

EHF score is the sum of the individual disability grades. EHF score i.e. sum of all the individual disability grades for two eyes, two hands and two feet (0-12) is recorded at each visit. The EHF score is more sensitive to change over time than the disability grade itself. An increase in the score, whether of an individual organ or the overall score would indicate some new or additional disability.

Management of deformities

Paralytic deformities for tendon transfer surgery

Pre and post-operative physiotherapy is essential for a successful outcome of tendon transfer surgery and needs to be arranged. The conditions which require tendon transfer surgery are claw hand due to paralysis of ulnar, median or both nerves, foot drop due to paralysis of lateral popliteal nerve, claw toes due to the paralysis of posterior tibial nerve, lagophthalmos due to paralysis of facial nerve and the wrist drop due to paralysis of radial nerve.

Facial deformities for cosmetic / plastic surgery

Madarosis: The loss of lateral parts of eye brows is due to lepromatous infiltrate destroying the hair follicles. Free graft from scalp or a temporal artery island flap usually gives satisfactory result

Sagging face / Mega lobule: This is due to rapid disappearance of the lepromatous infiltrate following treatment with chemotherapy and destruction of elastic and collagen fibres in the dermis. The defect produces an appearance of premature ageing. Pre auricular or naso-labial face-lift is indicated in selected cases.

Nasal deformity: These are due to the invasion and destruction of the nasal tissues by *M. leprae*. Depressed nose is mainly due to the destruction of the nasal septum. The septal perforation is caused by non-specific infection destroying the cartilage. Nasal deformities are the most prominent stigma of leprosy cases, the nasal mucosa is replaced by scar tissue which pulls the nose inwards. In a saddle nose defect, if the tip of the nose is in the normal position, a bone or cartilage graft would be the operation of choice. In advanced cases, a post-nasal inlay graft over a stent mould is to be preferred. In rare cases, with total destruction of nose, a forehead rhinoplasty is the method of repair.

Other deformities

Gynaecomastia or enlargement of male breast: This causes a lot of embarrassment to the patient. In lepromatous leprosy, destruction of seminiferous tubules of the testis by lepromatous granuloma results in hormonal imbalance producing gynaecomastia. It may follow testicular atrophy resulting from the orchitis of type 2 reaction. This deformity can be corrected by a modified Webster's technique.

Prevention of disability (POD)

It is the common term used to describe various measures offered to any leprosy disabled individual to prevent primary or secondary disability.

Prevention of Worsening of disability

Some leprosy programmes use this term to emphasize that measures offered are in effect to prevent the worsening of the disability in a person who has already developed disability.

Deformity care Program / Disability Care Program

These are colloquial terms often used as synonyms and in general include activities related to caring of the leprosy disabled persons. Programmes are aimed at prevention, correction and care of various disabilities in leprosy affected person. In the holistic approach it also includes socio-economic rehabilitation of the leprosy disabled persons.

Medical Rehabilitation

It is abroad term involving any treatment whether medical or surgical aimed at providing relief from signs and symptoms of leprosy. In holistic approach it also includes socio-economic rehabilitation.

Recurrent wounds of hands and feet

Common causes of wounds include injury due to sharp objects that cut or pierce through the skin like thorns or broken glass, repetitive pressure, friction or shearing forces (e.g. foot ulcers from walking or hand ulcers from using unprotected hand tools), burns etc. The abscess develops following infection and need to be drained surgically. The deep infection may lead to osteomyelitis. Such patients may have sequestra (pieces of dead bone) in the hand or foot which require removal. An X-ray of the affected part can help confirm the diagnosis. Sometimes in severe cases of recurrent wounds, amputation is the only solution, however this should only be considered as a last resort.

Management of wounds in brief

Probe the wound gently to search pus collection. Drain the pus, and flush the wound cavity with saline solution. Pack the wound with paraffin gauze and bandage it. Ask patient to elevate the part to facilitate healing and start systemic antibiotics. Change the dressings daily and decide regarding surgical debridement after 3 days when inflammation has reduced, pus discharge is controlled, dead and avascular tissues are removed and wound is clear. Pack wound with gauze soaked in antiseptic solution. Dressings are continued on alternate day. Plaster cast may be considered after two weeks. Proper counseling of patient is required for better compliance and coordination.

Complicated ulcers & Osteomyelitis

If an ulcer is found to be broken down in tissue only in the dermis and epidermis, it is termed a “simple ulcer”. If any ulcer is infected it is no longer simple ulcer. If the breakdown of tissue goes deeper than the dermis and other body parts are affected (i.e. tendons, tendon sheaths, bones and joints) the wound is termed a “complicated ulcer”. When the tissue around bones (periosteum) becomes infected the condition can lead to inflammation of bones (osteomyelitis).

Osteomyelitis is very difficult to treat and can cause chronic, non-healing lesions in bones. Without enough nutrients the infected bone dies and the small pieces of dead bone break away. These loose pieces of dead bone, called sequestra, will cause irritation in the wound which will not heal until the sequestra are removed or fall out. If the normal process of granulation is continuously interrupted by the irritation of sequestra the wound responds by producing hypergranulation tissue. Hyper granulation will be seen as masses of bright red tissue that bulge out of an ulcer. Wherever hyper granulation is seen it indicates that there is something irritating the wound and should be taken as a sign that further investigation is necessary.

People with deep or dirty ulcers or osteomyelitis should be referred for septic surgery and antibiotics. You should 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 advice and debridement (removal of dead and infected tissue) before taking steroids, or osteomyelitis may develop. Starting steroids before such treatment may lead to a worsening of the sepsis and more permanent damage, including the need for amputation.

All wounds are the result of tissue stress. Common causes of ulcer include:

- Sudden injury (e.g. sharp objects that cut or pierce through the skin like thorns or broken glass)
- Repetitive pressure, friction or shear forces (e.g. foot ulcers from walking or hand ulcers from using unprotected hand tools)
- Burns
- Secondary infection in macerated skin of web space with candidiasis can lead to deep abscess
- Rarely rat bite can also lead to ulcer

There are a few major principles that should be remembered when planning ulcer management. If these principles are followed, simple ulcers will heal without any medication:

These principles are rest, good wound environment, hygiene and protection.

Rest:

Almost all wounds will heal if they are rested. Regardless of the cause of injury, the first line in treatment of wounds is to remove the cause of tissue stress and then to allow the injured part to rest so that damaged tissue can repair itself. So long as the person with a wound is healthy, damaged tissue will repair itself. Rest doesn't necessarily mean that the patient must stay in bed (although for foot ulcers this is often the best option). If the person is unable to rest it may still be possible to rest the injured body part by splints.

Splinting

Walking with crutches (or even with a walking stick)- It will rest foot ulcers. Whatever the circumstances, the injured part should not be allowed to perform normal functions whilst the tissue is still being repaired.

The best option is for the person to spend as much time as possible, lying down with his foot raised above the level of his heart (bed rest). However, this is very rarely possible amongst people who must struggle to feed themselves and their families, so other options should be explored.

It is also very important to find out whether the person is able to change his activities so that he doesn't need to walk so much: for example, can he temporarily swap work with another person? Other transport options should also be considered: for example, riding a bicycle.

Management in brief

1. Examination of general condition of a case and local wound area. Probe the wound gently to search pus collection. drain the pus, if any.
2. Flush the wound cavity by saline solution.
3. Pack the wound with gauze and bandage it.
4. Elevate the part to facilitate healing.
5. Start systemic antibiotics.
6. Change the dressings daily and check for any further pus collection.

7. Surgical debridement after 3 days when inflammation is reduced, pus discharge is controlled and wound is clear. All the dead tissues and avascular tissues are removed. Wound space is packed with gauze soaked in Savlon solution. Dressing on alternate day after checking any more collection of pus, to be done.
8. Plaster cast with off-loading device may be considered after two weeks when wound is totally clear, healing has started and no signs of inflammation are there.
9. Wide spread use of antiseptics and topical antibiotics are to be avoided.
10. Oral preparation of zinc, vitamin C and vitamin A may be supplemented.
11. Proper counseling of patient is required for better compliance and coordination.

Treating the ulcer is a great opportunity to reduce fear & stigma through demonstrating ulcer care without any discrimination. Family members are also encouraged to learn and practice the dressing of ulcer and nursing care of patient.

Salvage procedures of the limbs such as arthrodesis of the subtalar or ankle joints

This is done for fixed equines deformities of the foot or totally paralysed feet with a flail ankle or forefoot deformities. These procedures are followed by immobilisation for long duration followed by specialised foot wear.

Criteria for referral of cases for RCS

The general criteria have been grouped into three categories: social and motivational, physical and the leprosy treatment criteria. The patients and the health worker both must be involved in the decision of referral for surgery.

Social and motivational criteria

All patients who would be benefited occupationally, economically or socially are considered suitable for reconstructive surgery. The employed technique of surgery must have the potential to make a difference to patient's acceptance in the family, improve the socioeconomic situation and be reintegrated as ergonomically independent member of the society.

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.

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 depending upon the particular circumstance.

The muscle paralysis should be present for at least one year and preferably not longer than 3 years. There may exceptional cases where there has been muscle paralysis for longer than 3 years and the individual has kept the joints supple through passive exercises. The patient may not remember accurately how long muscle paralysis has been present, so suppleness of the joints may be a more useful criterion. Patients with severe contractures or stiff joints are not suitable, although physiotherapy or surgery can reverse some contractures. There should be no infection of the skin such as scabies, and any deep cracks, wounds or ulcers at the time of referral.

Leprosy treatment criteria

Patients should have completed the scheduled course of MDT or at least a minimum of 6 months MDT. Patients should be free from reactions and symptomatic neuritis for at least 6 months. Patients should not have taken steroids in the immediate past (about 4 to 6 months) unless the surgery is for neuritis. There should be no tenderness of any major nerve trunk in the limbs.

The proposed surgical procedure and its positive consequences should be balanced against the consequences of not doing surgery. This should be discussed with the patient and the decision whether to undergo surgery should 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.

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.

Priorities for reconstructive surgery

Operations for lagophthalmos are usually considered as a high priority because of the possibility of secondary damage to the eye leading to blindness. Feet are usually considered the next priority for mobility followed by hands but this may depend on the needs of individual patients.



Physiotherapy

Physiotherapy is helpful in restoring the normal tone of muscles and preserving the physiological properties of paralysed muscles. It also helps in preventing muscle atrophy and the over stretching of paralysed muscle. Its main aim is to prevent contractures and keeping joints mobile, keeping the skin soft and supple and improve the blood circulation of the part.

Physiotherapy comprises exercises, oil massage, wax baths, hydrotherapy, splinting, electrical stimulation of muscles, shortwave diathermy, ultrasonic massage etc. Physiotherapy is very useful in the management of deformities and is essential in both pre as well as post-operative care of deformity patients. RCS requires the patient to use a different muscle in place of the paralysed muscles. The operated part is still vulnerable, and patient needs post-operative muscle training and instructions in the use of anaesthetic extremities. Instructions given by surgeon at the time of discharge should be followed. In general, the common postoperative muscle exercises are as follows:

Type of paralysis	Active Exercises	Passive Exercises
Claw hand	Stabilize the MCP (Metacarpo-Phalangeal) joint between the hand & the fingers at 90 degrees with palm of other hand. Keep the wrist straight. Extend the fingers keeping the same position. Repeatedly bend and straighten the fingers of the weak hand.	Straighten the clawed fingers repeatedly using the other hand.
For the thumb	Use other hand to hold the weak thumb steady at the (MCP) joint between hand and thumb.	Straighten the weak thumb at the distal joint (IP) and hold it straight for a few seconds. Straighten the paralysed thumb using his other hand and pull it away from the first finger towards the palm.
Foot drop	Practice lifting the fore foot upwards and holding it for a few seconds.	Sit with the leg straight. Pull the foot up using a towel. Repeat this movement several times.
Lagophthalmos	Think & blink. Close the eyes as strongly as possible	With the index finger on the skin at the corner of the eye, gently pull outwards, so that the eye closes. Do this procedure as often as possible.

Minimum Essential Splints

Finger loop splint

Used for:

Stabilising the MP joint to enable PIP joint extension.

Helps:

Keep MP flexion post-op, prevent contracture of skin and joints, correct or improve claw deformity, strengthen extensor expansion, stretch out mild to moderate stiffness pre and post op.

Precaution:

Change the loops if redness of skin or friction ulcer develops on the dorsum of the finger.



Gutter splint (dynamic, flexible)

Used for:

Hold the PIP joint in extension, passive stretching of volar skin at the level of PIP joints.

Helps:

To maintain the gain in range of movement and position maintenance as night splint, to overcome mild to moderate contracture of volar skin and stiffness of joints.

Precaution:

Do not use gutter splint in fixed deformity of PIP joint, discontinue its use if redness or ulceration develops on the dorsum of the PIP joint of the finger.



Adductor band splint

Used for:

Obtaining adduction of fingers, prevent splaying after 4 FMT

Helps:

To obtain adduction in splayed out fingers postoperatively. To adduct the fingers post-op in claw correction and hold fingers with unaffected fingers.



Opponens splint

Used for:

Keeping the thumb in abduction.

Helps:

Maintain abduction after opponensplasty. To prevent thumb web contracture in 'Ape-thumb' deformity,

Precaution:

To get abduction make a double loop of the rubber band.



Self-care Empowerment of patients with kit or materials

Considering the fact that majority of ulcers undergo cleaning and debridement in the operation theater, its dressing on regular basis becomes necessary either till it heals or it becomes fit for RCS. Often patients are discharged with advice on dressing as OPD Case. In place of that empowerment of patients in their self-care has been suggested and is practiced over a decade. Self-care forms a vital part of the program and considering the fact today that nearly 60% cases have ulcers and wounds on anesthetic extremities, educating the patient on self-care is of paramount importance. 'Self-care Kit' has necessary tools and materials with which self-care is made compliant, patients can be educated, empowered and even homemade materials can be replaced in the kit if necessary. Good results have been obtained with this technique.

The Self-Care kit is a transparent plastic zip pouch containing the following items:



- Foot scraper about 20 cm long, 6 x 3 scraping surface
- Antiseptic liquid
- Antiseptic or antibiotic skin ointment
- Moisturising cream or Vaseline
- Sterilised gauze packs of 5 x 5 cm
- Bandages 3" width x 3 meter
- Adhesive tape

In addition, a plastic tub (20" diameter and 8" height) is given separately as part of the kit to all patients. The materials are enough for 30 applications and replaced after a month. All patients are also given MCR footwear at the end of the session.

Technique of using the Self-Care Kit

1. Soak the feet
2. Scrape the sole of the foot and margin of the ulcer
3. Wipe the feet dry between toes
4. Apply antiseptic ointment on the ulcer
5. Apply moisturising cream in dry areas of foot and leg
6. Put two sterile gauze pieces on ulcer and apply bandage
7. Wear MCR footwear

Guidelines for trainers training

The trainers are to consider the following points –

- After training need assessment, plan for preparations, conducting and follow up of training courses would be prepared by the district in consultation with the State Leprosy Officer.
- Prepare ‘learning objectives’ according to job/task given to trainee / different category of staff and then design the curriculum.
- Concentrate on ‘how to achieve learning objectives’ through active learning process.
- Select appropriate teaching method for each session e.g. case demonstration, role play, group exercises, case study etc. Select the content and teaching aids required.
- Try to remove barriers / factors distracting learning.
- Evaluate the training course, evaluate the participant’s reaction & learning at the end of course and later on evaluate the performance on the job and effect of training after few months.

Coordination and Linkages

Medical officer will coordinate with district nucleus for effective referrals, training, and logistics.

Primary care institutions will maintain direct linkage with the District Hospital unit (secondary level) for referral of all types of cases. The referral slip should be marked to the district nucleus unit, which will be the linkage point amongst primary, secondary and tertiary level centres. The secondary care level institutions will maintain direct linkages with the identified tertiary care institutes for referral of cases for RCS and other complications. Secondary level and tertiary level units will refer back cases after diagnosis and initiation of treatment to the primary care level units with proper instructions for maintenance of treatment and follow-up.

To perform various activities of DPMR satisfactorily it is mandatory to have close coordination with the various divisions of health services like PHC units and hospital services. Coordination with district nucleus is crucial in procurement of drugs, consumables, aids & appliances, consolidate information and generate reports.

The District Nucleus will coordinate and provide linkages amongst the primary, secondary and tertiary level centres for all other issues. Similarly, on clinical aspects the Dermatologist / Physician of the District hospital will need to coordinate with the ophthalmology, orthopaedic surgery, and physiotherapy departments of the institution for internal referral of cases.

Linkages

The district nucleus need to have good linkages with the local NGOs working in the area as well as national NGOs which support the NLEP. The linkage with Ministry of Social Welfare is necessary to rehabilitate patients economically after RCS or recovery from deformity. Other types of linkages necessary are with special investigative facilities like PCR, serological tests, histopathology and mouse footpad inoculations to study drug resistance or viability of *M. leprae* and so on. In view of ICMR giving preference to leprosy research including reconstructive surgery, it is utmost important that NLEP liaison with tertiary care centers for result oriented output for eradication of leprosy.

IMPLEMENTATION OF DPMR SERVICES AT PRIMARY LEVEL

Goal

Disability burden due to leprosy is reduced.

Objectives

1. To prevent disability in new leprosy cases,
2. To prevent new disability or worsening of disability in under treatment cases and in the cases who have completed the treatment,

Strategies

1. Empowerment of community, patients and community level functionaries like GKS (VH&SC) to take ownership of eliminating disability in leprosy in their village by increasing the awareness for early self-reporting
2. Strengthening of capacity of ASHA at village level to suspect early neuritis and reactions in leprosy cases and their referral, monitoring of self-care practices and ulcer dressing carried out by people affected with leprosy himself,
3. Strengthening of Sub center and sector PHC to ensure coordination and supportive supervision of works carried out by ASHA,
4. Strengthening of Block CHC to function as nodal referral center at primary level to carry out preventive, curative and referral services to prevent new disability and worsening of disability in people affected with leprosy.
5. Simplification of information system in respect of DPMR activities
6. Provision of materials like *MCR foot wear*, grip aids, self-care kits, splints for hands and feet, POP, ulcer dressing kits to all needy patients

Primary level functionaries

Patient / PAL, family members, community

Village, VH&SC, ASHA

Sub-center

Sector PHC

Block CHC

RKS

Secondary level functionaries

District HQ Hospital

Apex Group

DLO

MO DN

RKS

Tertiary level functionaries

Medical College Hospitals

PMR Institutions

Activities at Primary level

1. Early Detection of leprosy and its complications

- Community empowerment and mobilization for self-referral
- Capacity building of VH&SC (GKS) / ASHA / AWWs, HWs, AYUSH MO for identification of suspects and their referral.

2. Early Referral of disabled cases

- Identification of all cases of leprosy having disability problems, their early referral and their follow-up at village level

3. Diagnosis and treatment

- All reported and referred cases will be examined following standard procedure, diagnosed based on cardinal signs and treated with MDT by MO PHC/CHC.

4. DPMR services

- Assessment of Disability status including identification of cases who are at Risk of developing disability to provide the preventive and curative services to all needy patients,
- Diagnosis of leprosy reactions and its treatment with prescribed doses of prednisolone by MO PHC/CHC.
- Diagnosis of early nerve impairment and its management,
- Prevention and treatment of simple ulcer,
- Providing MCR foot-wears, splints, aids & appliances, ulcer dressing kits etc.
- Promote self-care practices
- Recording and reporting

5. Referral services

- Difficult to diagnose cases
- Lepa Reactions difficult to manage
- Complicated ulcer
- Eye problems
- Cases requiring Reconstructive Surgery
- Persons needing customized footwear

Operating Procedures

1. Patient Mobilization

Patients are either reporting directly or referred by GKS/ASHA/AWW, Health workers/MO PHC/Ayush MO. The family members or other persons affected by leprosy may also refer the patient to PHC/CHC.

2. Service Components

■ **Diagnosis and treatment:**

All reported and referred cases will be examined following standard procedure:

■ **History taking**

- Duration of lesion
- Duration of disability if any
- Family history/ contact history
- Previous treatment

■ **Examination of skin**

- Number of patches/ lesions
- Color of patch
- Morphology of patches
- Nodules, infiltration (SOS)
- Test for loss of sensation in the patch

■ **Examination of nerves**

- Palpation of all peripheral nerves (trunk nerves commonly affected and cutaneous nerves) for thickening and tenderness
- Peripheral anaesthesia (ST)
- Dryness and cracks over sole or hand
- VMT
- Signs or symptoms of neuritis

■ **Examination of eyes**

■ **Cardinal Sign(s)**

- Signs of activity

■ **Grouping**

- MB/PB

■ **Registration**

- For initiation of MDT

3. DPMR services

After diagnosis of a case of leprosy based on the cardinal signs, the Medical Officer or Para-medical Worker at CHC will proceed further to assess the disability status of each case.

Physical examination, look for:

- Dryness of hands and feet
- Swelling and redness on patches and joints
- Wasting of muscle, visible deformity in hand, feet, eye
- Redness on palm or sole, callous, Blister, ulcer
- High stepping gait or any change in gait
- Appearance of new lesions or expansion of existing lesion
- Absence of blink in the eyes
- Redness and watering in the eyes

Examination of nerves

- Palpation of peripheral nerves for thickening and tenderness (Ulnar; Median; Radial; Lateral Popliteal; Posterior Tibial;)
- Sensory testing over Hands (palm) and Feet (sole)
- Voluntary muscle testing – Abduction of little finger, Abduction of Thumb and Extension of wrist, Dorsi-flexion of foot and light closure of eyes

Clinical findings are interpreted to assess the activity of disease and whether nerve damage is reversible or not. Potential disabilities (at risk of developing disability) are noted for their regular monitoring.

Examination of Eyes

Eyes are examined for acuity of vision, lid gap and redness or any other change.

- Look for any redness of the eye
- Note “watering from the eye” from history and observation
- Observe for blink – Present or Absent
- Look for lid gap or inability to close one or both eyes (Lagophthalmos) and check for normal strength of eye closure. Measure the gap in millimeter.
- Check the visual acuity of each eye separately, using a Snellen’s chart or by counting fingers at 6 meters. If the person cannot read the top line of the chart, or count fingers at 6 meters, they are visually impaired and have grade 2 disability in that eye.

Sensory Testing (ST):

Impairment of Sensation is a main cause of disability and deformity in leprosy. The objective of the ST is to detect easily nerve damage. It is very important to pick up the skill of eliciting sensory loss in skin supplied by nerve.

- You will need a ball point pen (with plastic body)
- Explain to the person what you are going to do and demonstrate it.
- Touch the skin with the pen, ask the individual to point to the spot touched with his / her index finger
- Repeat this procedure a few times until the patient is familiar and comfortable with the procedure
- Now ask the patient to close his eyes and repeat the procedure (first on the normal skin then over the affected area)
- While testing lesion over inaccessible areas (back, buttocks) the patient may be asked to count on each touch

Remember:

- 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 pen should be perpendicular to the surface of the skin.
- Do not keep asking the patient whether he feel the touch. You may get misleading result
- Proceed from the normal skin to the patch
- Give only one stimulus at a time
- Vary the pace of testing

General Practices:

I. All the activities below Block level will be implemented in integrated manner with existing health functionaries.

II. At sector PHC level MO, AYUSH MO and HW/Supervisor will be responsible for supervision and continuance of treatment for complication of leprosy of their area.

III. Existing registers and forms have been modified and made simpler to be handled at CHC level.

IV. CHC will be Key Functional Unit at primary level for provision of DPMR services of entire Block area,

V. Accordingly training curriculum for each group of functionaries as per job responsibility has to be developed by SLO and training will be imparted by MO CHC accordingly,

VI. Logistic planning and IEC planning will be done and implemented by MO CHC.

Suspecting complications at field level

How to suspect cases of leprosy reaction, neuritis, relapse, insensitive hands & feet by the ASHA or Health Workers / Ayush MO and refer to the Primary level Health Centers (CHC) for diagnosis:

All patients affected by leprosy, ASHA, health workers will be trained to suspect leprosy reactions, neuritis, relapses and Grade 1 & 2 disability. Clinical features to identify each are as under:

- Lepa reaction is the sudden appearance of signs of inflammation in the skin lesions or nerves or eyes of a person with leprosy. There is redness, swelling and sometimes tenderness of the skin lesions. New skin lesions or symptoms suggestive of new nerve damage, such as numbness, or muscle weakness in the hands or feet may appear. Crop of subcutaneous nodules may appear. Above signs and symptoms may be seen in new patients, patients under MDT and also persons who have completed full course of MDT.
- Neuritis is a common problem. During neuritis patients present pain in nerves, sudden development of anaesthesia or sudden increase in area of anaesthesia, sudden weakness or paralysis of muscles of eye, hand and foot, tingling sensation over extremities.
- 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 gradual appearance of new skin lesions. Signs of inflammation or neuritis are usually not there.
- Insensitive hands & feet can be identified by sensory testing in that area. Insensitive palms and soles are prone to develop ulcers due to abnormal pressure on part or due to external injury. Look for any red or bluish spot on feet which is the first sign of blister and ulcer development.

Identification and Management of Disability Grade 1

After assessing the disabilities and its grades, Medical Officer CHC should take care to contain and reverse the effects of disabilities. Cases with anaesthesia of palm/sole are to be assessed properly. If the duration of disability grade 1 i.e. anaesthesia along the course of trunk nerve is recent (< 6 months), a course of Prednisolone is to be started to treat neuritis. If the duration is more and anaesthesia is irreversible, Prednisolone will not help but the condition is to be prevented to progress in to grade 2. Anaesthetic sole/palm is prone to injuries resulting into ulcer, wound, secondary infection leading to mutilation & absorption of parts. To prevent this deterioration, cases must be educated and counseled to adopt “self-care practices”. People need to be informed clearly about the actions they can take at home that are appropriate for their particular situation.

How can people be encouraged to practice self-care at home?

The health worker and ASHA may be the main source of advice, provision of self-care kit / material and counseling will enable a case to adopt self care procedure. Village Health & Sanitation Committee / Gaon Kalyan Samiti can also help to motivate persons affected by leprosy to adopt the self care practices on regular basis:

- Community / family members can help and encourage the person to do what is needed on a regular basis
- Other people affected by leprosy can also be exemplified for how they have been able to look after themselves at home

Self-care groups have been started in some places. A number of people with self-care need to meet together regularly to discuss the practicalities of self care. These groups are often supportive and can be very motivating for members.

Special efforts / counseling will be needed for those cases which are reluctant to adhere to ‘self-care’ practices

Patients having Cataract in the Eye

Leprosy patients with cataract (visual acuity < 6/60) should be referred for cataract extraction with IOL so that with improved vision they are able to protect their anaesthetic hands/feet also.

DPMR activities to be carried out at Primary level in Urban Areas

- *Involvement of following personnel in urban areas will be ensured:*
- *RWA (Residence Welfare Association)*
- *USHA*
- *Pradhans of resettlement colony and urban slums*
- *Anganwadi Workers*
- *Dispensaries and urban health posts to be outlet for DPMR services,*
- *Strengthening coordination of different players like State Govt., Central Govt., Local Bodies and Private sectors.*

Operational Aspects

Activities at community level

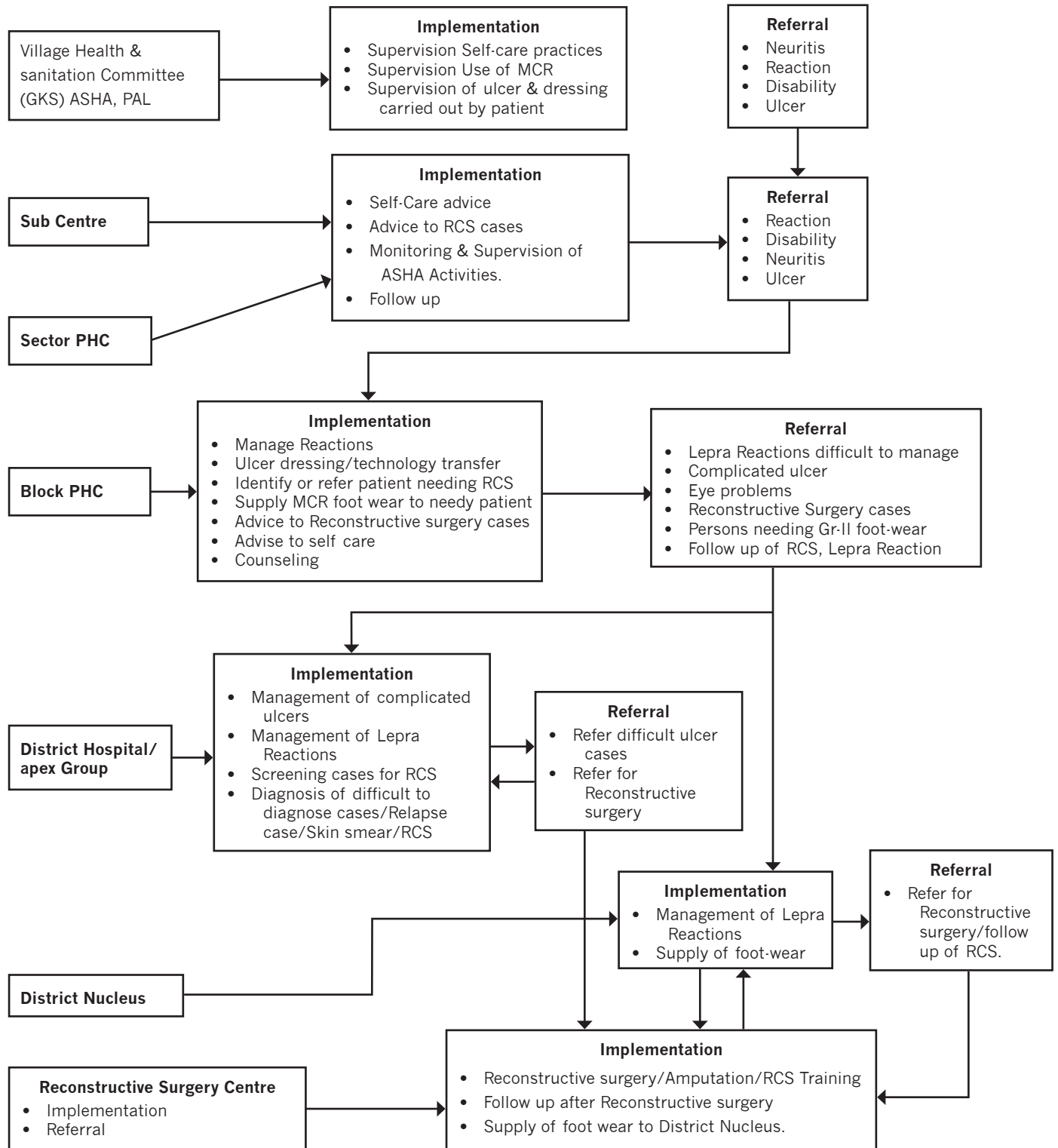
Level of Operation	Institution and Person responsible	Key Activities/Jobs/ Responsibilities	Referral	Supports required
Person having signs and symptoms of leprosy/ person(s) having Gr-1 or Gr-2 disability/ persons having trophic ulcers	Family members of people affected with leprosy and person him/ herself	Self referral to nearest health facility or nearest health personal, Acquire knowledge and skills for carrying out Self-care practices and carry out those regularly, use of MCR footwear regularly, regular dressing of ulcer	<ol style="list-style-type: none"> 1. If person does not experience any benefits of Self-care practice or Ulcer does not start healing within 15 days or any worsening noticed 2. New signs and symptoms of neuritis/ neural pain/increase in area of anaesthesia/ weakness of muscles of hand, feet or any eyes problem noticed 	PAL/Family members/ community need to be educated about Self-care practices and complications of leprosy

Activities at institution level and referral mechanism:

Institution and Level	Implementation (Activities to be carried out)	Referral (conditions for referral)	Functionary/Person responsible
VH&SC/GKS at Village	<ul style="list-style-type: none"> • Identification of suspects having signs of leprosy, neuritis, nerve function impairment and old cases having disability • Monitoring of treatment completion • Monitoring of Self-care practices carried out by patient • Monitoring of use of MCR foot wear by patient supplied MCR foot wear • Interpersonal communication for community empowerment and participation 	<ul style="list-style-type: none"> • All suspects having signs of leprosy, neuritis, nerve function impairment and old cases having disability, • Patient requires MCR foot wear 	VH&SC/GKS, ASHA
Sub Center Level	<ul style="list-style-type: none"> • Delivery of MDT to under treatment cases • Maintain the case card LF-01 • Update the sector register on the day of sector meeting • Identification of early signs of neuritis, reaction and other complications of under treatment cases at SC • Supervision/Monitoring of treatment completion • Supervision/Monitoring of Self-care practices carried out by patient • Supervision/Monitoring of use of MCR foot wear by patient supplied MCR foot wear • Interpersonal communication for community empowerment and participation 	<ul style="list-style-type: none"> • All suspects having signs of leprosy, neuritis, nerve function impairment and old cases having disability, • Patient requires MCR foot wear 	MPHW (M/F)
Sector PHC	<ul style="list-style-type: none"> • Delivery of MDT to under treatment cases at PHC • Delivery of prednisolone to patients undergoing treatment for neuritis and reactions • Supply of dressing materials to patients having ulcers • Maintain the sector treatment register and up-date the master register at CHC 	<ul style="list-style-type: none"> • All suspects having signs of leprosy, neuritis, nerve function impairment and old cases having disability, • Patient requires MCR foot wear 	MO Sector PHC. Ayush Doctor and MPHS

Institution and Level	Implementation (Activities to be carried out)	Referral (conditions for referral)	Functionary/Person responsible
	<ul style="list-style-type: none"> • Identification of early signs of neuritis, reaction and other complications of under treatment cases at PHC • Supervision/Monitoring of treatment completion • Supervision/Monitoring of Self-care practices carried out by patient • Supervision/Monitoring of use of MCR foot wear by patient supplied MCR foot wear • Interpersonal communication for community empowerment and participation 		
CHC	<ul style="list-style-type: none"> • Diagnosis of disease in all suspects referred from village/ PHC or directly reporting at CHC having signs of leprosy, neuritis, nerve function impairment and old cases having disability • Initiate treatment with appropriate counseling • Provide other supportive treatments like POP, splints, slings, MCR foot wear • Detail assessment of all cases having nerve function impairment and recording of findings • Advise and demonstrate self care practices • Slit skin smear examination for AFB from suspected LL cases and relapse cases • Ulcer management/dressing • Supply of dressing materials and ulcer dressing kit to patients • Counseling to pts/family member/community members • Planning training programs for Health Workers/ASHA and other GKS members and execution of training • Supervision and monitoring • Record maintenance and submission of monthly reports 	<ul style="list-style-type: none"> • Pt not responding to steroid or has developed dependency • Pts having other associated diseases like Tb, HIV/ AIDS, Diabetes/ Hypertension requiring prednisolone treatment for neuritis and reactions • Complicated ulcers requiring surgery • Patients fit for RCS and willing for surgery • Pt having eye complication <p><i>Any problem in eye of person noticed in affected persons will be referred directly to Ophthalmologist of DHH</i></p>	MO in charge of CHC supported by PMW/HS

Referral Protocol



Job responsibilities - Primary Level for DPMR activities

Sl. No.	Staff/facility	Job responsibility
1.	ASHA/GKS	<ul style="list-style-type: none"> • Identification and referral of suspects having signs of leprosy, neuritis, nerve function impairment and old cases having disability to MO CHC • Monitoring treatment completion • Monitoring Self-care practices carried out by patient • Monitoring use of MCR foot wear by patient supplied MCR foot wear • Interpersonal communication for community empowerment and participation
2.	MPHW (M/F)	<ul style="list-style-type: none"> • Delivery of MDT to under treatment cases • Maintain the case card LF-01 • Update the sector register on the day of sector meeting • Identification and referral cases with early signs of neuritis, reaction and other complications of under treatment cases at SC • Referral of Gr-I & II RFT cases to PMW CHC for registration and SCP advices and assessment using P-III • Referral of suspected relapse to MO CHC • Referral cases requiring MCR foot wear to PMW CHC • Supervision/Monitoring of treatment completion at village level • Supervision/Monitoring of Self-care practices carried out by patient at village level • Supervision/Monitoring of use of MCR foot wear by patient supplied MCR foot wear at village level • Interpersonal communication for community empowerment and participation at village level
3.	Sector MO/Ayush MO/MPHS	<ul style="list-style-type: none"> • Delivery of MDT to under treatment cases at PHC • Delivery of prednisolone to patients undergoing treatment for neuritis and reactions • Supply of dressing materials to patients having ulcers • Maintain the sector treatment register and up-date the master register at CHC • Identification of early signs of neuritis, reaction and other complications of under treatment cases at PHC treat them on emergency-basis and refer them to MO CHC • Referral of Gr-I & II RFT cases to PMW CHC for registration and SCP advices and assessment • Referral of suspected relapse to MO CHC • Referral cases requiring MCR foot wear to PMW CHC • All referral to be done using P-III • Supervision/Monitoring of treatment completion • Supervision/Monitoring of Self-care practices carried out by patient • Supervision/Monitoring use of MCR foot wear by patient supplied MCR foot wear • Interpersonal communication for community empowerment and participation

SI. No.	Staff/facility	Job responsibility
4.	PMW	<ul style="list-style-type: none"> • Support MO CHC in Diagnosis of disease in all suspects referred from village or directly reporting at CHC having signs of leprosy, neuritis, nerve function impairment and old cases having disability • Support MO CHC in Initiation of treatment with appropriate counseling • Provide other supportive treatments like POP, splints, slings, MCR foot wear • Detail assessment of all cases having nerve function impairment and recording of findings in case card and Form –PII • Advise and demonstrate self care practices • Slit skin smear examination for AFB from suspected LL cases and relapse cases • Ulcer management/dressing • Supply of dressing materials and ulcer dressing kit to patients • Counseling to pts/family member/community members • Planning training programs for ASHA and other GKS members and execution of training • Supervision and monitoring • Record maintenance in P-I and submission of monthly reports • Logistic planning/indenting and supplies
5.	MO CHC	<ul style="list-style-type: none"> • Diagnosis of disease in all suspects referred from village or directly reporting at CHC having signs of leprosy, neuritis, nerve function impairment and old cases having disability • Initiate treatment with appropriate counseling • Providing guidance to PMW in carrying out all jobs assigned to PMW • Planning training programs for ASHA and other GKS members and execution of training • Supervision and monitoring • Referral of patients not responding to steroid of developed dependency • Referral of patients having other associated diseases like TB, HIV/AIDS, Diabetes/Hypertension and requiring prednisolone treatment for neuritis and reactions • Referral of Complicated ulcers requiring surgery • Referral of Patients fit for RCS and willing for surgery • Referral of cases with eye complications • Cross check Disability Register • Generate P-2 of MPR every month and submit it to District Leprosy Officer • Supervision of Record maintenance and submission of monthly reports

Capacity Building of personnel at primary level:

Level	Personnel to be trained	What to be trained	Who? will impart training	Duration of training
Village	PAL, Family member of PAL, GKS, community level functionaries	How to suspect early case, early neuritis, reaction, do self care practice, ulcer dressing, use of MCR footwear-they will be trained about presentation of leprosy like patch over body, sudden appearance of new patches, redness, swelling and tenderness in existing cases, pain in peripheral nerves, red eye, self-care of eyes having lagophthalmos, insensitive hand and feet, simple techniques of ulcer dressing, use of ulcer dressing kits, use of MCR footwear for PAL having insensitive foot	By trained HWs, MO PHC, AYUSH MO ASHA and MO I/C CHC during village visits in an integrated manner	Hands on training in the field
CHC	All ASHA, HWs, Supervisors, AYUSH MO, PHC MO	How to suspect early case, early neuritis, reaction, and PAL having disability problems and refer them to MO CHC promote self care practice, ulcer dressing, use of MCR footwear-they will be trained about presentation of leprosy like patch over body, sudden appearance of new patches, redness, swelling and tenderness in existing cases, pain in peripheral nerves, red eye, self care of eyes having lagophthalmos, insensitive hand and feet, simple techniques of ulcer dressing, use of ulcer dressing kits, use of MCR footwear for PAL having insensitive foot	MO I/C CHC integrating with other training programmes. MO DN /DLO will also be as resource persons	4 hrs during training live patients will be demonstrated while training (must)
District Level	MO I/C PHC, PMW, Physiotherapist and other supervising officers, BPOs	History taking, Clinical examination of all cases mainly focusing on methods of nerve examination, conduction of Sensory Test (ST) and Voluntary Muscle Test (VMT), Assessment disability and filling up the P-II, special attention on cases at risk, Monitor and conduct nerve assessment of at risk cases in every month, diagnosis of neuritis, reaction and management, techniques of simple ulcer management, How to run DPMR clinic at CHC and PHC, logistic arrangement, record keeping, identifying cases required referral to Secondary level and refer them follow up of referral cases, post-operative care of RCS cases, supervision	DLO/MO DN, SLO	2 days training

Supervision, Monitoring, Evaluation

Medical Officer I/C CHC will supervise and monitor activities of the ASHA, Health Worker, Supervisors and Pharmacist.

The District Nucleus under the DLO will supervise and monitor DPMR activities in the primary care level.

Supervision:

Supervision is extension of training, intensified immediately after training to ensure that health workers have fully acquired the skills taught and to provide any guidance needed.

It is systematic process for increasing the efficiency of health workers by

1. Developing their knowledge
2. Perfecting their skills
3. Improving their attitudes towards their work &
4. Increasing their motivational levels

It is carried out in direct contact with the health worker and it is aided by programme monitoring. All health workers need help to solve problems and overcome difficulties. They also need feedback on their performance and encouragement in their work. The supervisor's personality is important. Good supervisors have a pleasant and friendly manner, and are quick to establish rapport with health workers of all categories. They are ready to listen with an open mind to any problems and to seek solutions that will take into account the suggestions of the health worker concerned.

Two main levels of supervision can be distinguished

- Supervision of activities at Village / sub-centre / Addl. PHC by Block level MPS / Medical Officer
- Supervision of activities at CHC / PHC by the district authorities / District Nucleus

Problem-solving: If a health worker is unable to perform a task adequately because of lack of knowledge, then the supervisor should demonstrate that particular activity and ask the health worker to repeat it in the presence of the supervisor, such a coaching on the spot would solve the problem permanently. If solution is not available readily then it should be discussed with the seniors. Conclusion should be written in the health facility register to take necessary measures.

Supervisory visit to Primary health units by the Block:

Frequency: Hospitals and health centres with a large number of outpatients should be visited once a month and those health facilities with fewer patients may be visited once in 2-3 months. The visit should be on regular basis and based on the performance. A checklist has to be formulated considering the following issues.

1. Review of disability status, initial and its follow-up
2. Observation of health workers doing their work, for example palpating the nerve, method of doing ST and VMT, vision test, Active / Passive exercises, dressing the ulcer and counseling
3. Discussion with the health workers: the supervisor should talk to each category of staff separately, identify their problems, and establish its cause and try to solve them with the cooperation of each worker, particularly about referral of cases and follow up of cases returned from referral centres
4. Control of supplies: the supervisor should check the availability of essentials such as drugs, dressing materials, foot wears etc.
5. Discussion with the patients: The supervisor should also talk with individual patients, cross check about their knowledge of the disabilities and its management

Supervision visits to health units by the district:

Frequency of visit to: Hospitals and health centres will depend on cases load and problems identified.

Items to check: A checklist has to be formulated considering the following issues.

1. Review of disability initial/follow-up records
2. Observation of health workers doing their work, for example palpating the nerve, method of doing VMT, vision test, Active / Passive exercises, dressing the ulcer and counseling
3. **Discussion with ASHA, health workers:** the supervisor should talk to each category of staff separately, identify their problems, establish its cause and try to solve them with the cooperation of each worker, particularly about referral of cases and follow up of cases returned from referral centres

4. **Control of supplies:** the supervisor should check the availability of essentials such as drugs, dressing materials, foot wears etc.
5. **Discussion with the patients:** The supervisor should also talk with individual patients, cross check about their knowledge of the disabilities and its management
6. **Reports:** look for accuracy, completeness and timely submission
7. Discussion in detail about new disability produced in any case

Monitoring:

It is also to ascertain whether activities are being accomplished as planned; it is a daily management activity, to identify problems early so that they can be solved without any delay. It indicates where we stand and how far we are from the goal, so that we can make a plan of action to rectify. We make interventions as per the plans made, monitoring helps assessing the impact of these interventions. It provides objective indicators to assess if they were effective, or ineffective, and help identify the problems and plan corrective actions.

The main objective of monitoring is to identify and resolve operational problems as soon as they emerge. Realistic solutions to operational problems will call for identification of causes and corrective action.

During the implementation phase of DPMR initiative, important activities like coverage of training, provision of logistics, information management system, communication, advocacy and laboratory services, nursing and theatre services should be monitored.

Different aspects of each activity need to be monitored like Quality of work performance, quantity of certain outputs or outcomes, and the timeline with which an activity is accomplished.

Methods of supervision & monitoring:

- *Record and report review*
- *Direct observation*
- *Discussion with health worker*
- *Discussion with patients*
- *ASHA: To monitor self care practices and use of MCR footwear by PAL*
- *ANM: She will supervise work of ASHA*
- *MPHW (M/F) will monitor/ supervise work of ASHA*
- *PMW/NMS will supervise the job of ANM at subcenter and ASHA of village level and will play the lead role in monitoring the program*
- *MO will take an overall responsibility of monitoring the program.*

Performance Indicators and Aspects to Monitor

Key performance Indicators	Aspects to monitor
POD Services provided	
Training	<ol style="list-style-type: none"> 1. No. of different category of staff trained 2. Quality of training (duration, % of time devoted to practical, trainee: trainers ratio)
Logistics	<ol style="list-style-type: none"> 1. Stocks of Steroids, loose Clofazimine 2. Consumables 3. Forms and Registers, etc.
Communication	<ol style="list-style-type: none"> 1. No. of posters on hand care, feet care & eye care 2. No. of participatory methods of ulcer care conducted in a month with patients & families
Advocacy	<ol style="list-style-type: none"> 1. No. of coordination meetings conducted with like minded agencies
Supervision	<ol style="list-style-type: none"> 1. Frequency of supervisory visits at health units/districts/state 2. Whether visits are made on schedule 3. Whether visits resulted in corrective action to solve the identified problems
Operational indicator	<ol style="list-style-type: none"> 1. No. of cases with disability - grade I and grade II 2. No. of cases developing new disability 3. No. of reaction cases put on Prednisolone 4. No. of cases undergone surgery 5. Multi drug treatment completion rates 6. No. of Relapse cases suspected and referred

Logistics & Supplies

All primary care level institution should have:

MDT, Prednisolone, MCR foot-wear and Dressing materials

Treatment protocol (symptoms and signs guide) Learning materials and Flash cards

Recording and reporting formats and Referral slips

Records & Reports

Records to be maintained at Primary level are as under:

- Disability Register: Form – P-1
- Assessment of Disability and Nerve Function: Form – P-2
- Record of Lepra Reactions/Neuritis Cases – P-3
- Prednisolone Card: Form – P-4
- Referral Slip for ASHA/HW/PHC/CHC to CHC/District: Form – P-5
- The Monthly Progress Report (MLF-04) submitted by PHC to District: MLF-04 (Page 2)

IMPLEMENTATION OF DPMR SERVICES AT SECONDARY LEVEL

Objectives

1. To prevent disability in new leprosy cases,
2. To prevent new disability or worsening of disability in under treatment cases and in the cases who have completed the treatment.

Strategy

- Formation of District Apex Group at District HQ Hospitals headed by Dermatologist / Physician along with specialists of Orthopedics / General Surgery, Ophthalmology, assisted by Physiotherapist & Laboratory Technician and coordinated & facilitated by MO DN / DLO.
- All District Hospitals will be strengthened with provision of skin smear examination facility and physiotherapy unit.
- Some District Hospitals will be strengthened to provide RCS services.
- Some District Hospitals will be strengthened / outsourced to manufacture customized foot-wears.

Activities at Secondary level

1. Validation and Diagnosis:

- Validation of cases diagnosed at PHC/CHC level on sample basis to assess quality of diagnosis and disability status
- Diagnosis of directly reporting and Difficult to diagnose cases referred from primary level
- Confirmation of suspected relapse cases referred by primary level
- Reaction and neuritis cases referred

2. Treatment:

- Initiation of treatment of all cases diagnosed at secondary level
- Reaction and neuritis cases referred
- In-patient management of severely ill cases

3. DPMR Services:

- Assessment of disability status
- Management of Lepra Reactions
- Management of complicated ulcers
- Management of eye complications
- Physiotherapy including Pre and post-operative care
- Follow up of cases treated at tertiary level
- Supply of customized footwear
- Supply of ulcer dressing kits, Aids, splints and appliances
- Self-care counseling
- Outreached services to leprosy colonies
- Screening of cases for RCS
- Reconstructive surgery*
- Amputation surgery*

4. Lab. Services:

- Skin smear examination and other investigations required
- Blood examination for LFT, Sugar etc.
- X-ray

Training and Capacity building:

- Assess training need
- Organize training as per requirement of MO PHC/CHC and others

Referral:

- Recurrent ENL cases
- Severe reaction or complicated cases like pt. having hepatitis, nephritis or multi organ involvement
- Patients requiring further investigations like histopathology/ microbiology/other investigation required
- Cases fit for RCS
- Eye cases could not be managed at secondary level

Cases referred from primary care units may be of following types:

- *Cases difficult to diagnose leprosy, and in need of confirmation*
- *Cases with Severe Lepra Reaction*
- *Cases with suspected relapse*
- *Cases with adverse effects of MDT*
- *Cases with disability grade II requiring medical or surgical treatment*

Monitoring and Supervision:

- Record and report
- Field visits
- Monthly / review quarterly meetings
- **Inter-sectorial Coordination and linkages:**
- CBR

- *Cases requiring Physiotherapy and counseling services*
- *Cases requiring material support, like MCR foot-wear, crutches, protective goggles etc.*
- *Laboratory facilities for smear examination*

Financial activity:

- Procurement of prednisolone, aids/appliances and supportive drugs
- Payment of incentives/loss of wages

Source of patients

Patients referred by primary health care units and voluntarily reporting patients.

Service functionaries

- A. Apex group at district hospitals / district referral centers
- B. District Nucleus Team (DNT)

A) Apex Group at District Hospitals/ Referral Centers

District Referral centre is meant to function to address the needs of patients referred from primary health centres and community and private health providers. The purpose of the centre is to provide specialized treatment services to persons affected by leprosy and to function as a clinical training resource for the Medical Officers and Para-medics in the district.

MODN/DLO/LT/Physiotherapist/Physician at district hospital is to coordinate DPMR services there. A 'District Apex Group' will consist of Dermatologist / Medical Specialist, Orthopedic Surgeon, Ophthalmologist and Physiotherapist/LT. The MODN/DLO after receiving the referred or directly reporting patient will refer the patient to concerned member of the Apex Group. These patients will be clinically assessed, hospitalized and treated or referred to tertiary care unit as per need.

MODN/DLO/NMS will receive the referred cases or directly reporting cases at the district hospital through common registration counter of OPD and the patient will then be referred to the concerned member of the apex group to get services.

District Apex Group at district hospital i.e. District Referral Centre (DRC) will

- Provide treatment to cases of Lepa reaction/neuritis referred or reported,
- Provide treatment to eye complications in consultation with Ophthalmologists,
- Provide treatment to cases with ulcers and deformities,
- Provide surgical treatment to cases with eye complications, abscess, foot drop and other surgeries possible at district hospital,
- Get all the treated cases recorded in the treatment register,
- Refer the cases to tertiary referral centres, which cannot be managed in district hospitals e.g. major surgery, laboratory investigations, expert's opinion, etc.
- Ensure pre and post-operative physiotherapy,
- Refer back the operated cases to PHC with follow up instructions,
- Develop linkage with PHC and Tertiary Hospitals,
- To prepare the required reports with assistance from PT / NMS and assess DPMR activity.

How to Manage Complicated Cases:

The secondary level institutions will get complicated disability cases from the primary level for assessment and further necessary actions. Management of reactions has already been described earlier. Cases with severe reactions must be admitted and investigated appropriately. Majority of disability grade 2 cases referred to the secondary level care institutions. The treatment of eye complications has also been described earlier and all such cases should be referred to ophthalmology department.

Disability assessment – Disabilities are to be assessed to judge the extent, whether reversible / irreversible and prognosis with or without treatment. Careful clinical examination –

- By taking history of duration of disability, previous treatment & its response
- By sensory testing over the area
- By examination of nerves through palpation & voluntary muscle testing
- Eyes are to be examined for acuity of vision, redness, blink and proper closure of eye lids
- Oral and nasal examination should be done in cases of lepromatous leprosy
- Disabilities assessed are to be graded and recorded

Management of complicated ulcers:

All wounds are the result of tissue stress. Common causes of ulcer include:

- Sudden injury (e.g. sharp objects that cut or pierce through the skin like thorns or broken glass)
- Repetitive pressure, friction or shear forces (e.g. foot ulcers from walking or hand ulcers from using unprotected hand tools)
- Burns
- Secondary infection in macerated skin of web space with candidiasis can lead to deep abscess
- Rarely rat bite can also lead to ulcer

There are a few major principles that should be remembered when planning ulcer management. If these principles are followed, simple ulcers will heal without any medication:

- Rest
- Good wound environment
- Hygiene
- Protection

Note:

All grade 2 cases referred to district hospital should be directed to physiotherapy department for splintage and pre and post-operative care.

Almost all wounds will heal if they are rested. Almost all wounds will get worse if they are not rested.

Regardless of the cause of injury, the first line in treatment of wounds is to remove the cause of tissue stress and then to allow the injured part to rest so that damaged tissue can repair itself. So long as the person with a wound is healthy, damaged tissue will repair itself. Rest doesn't necessarily mean that the patient must stay in bed (although for foot ulcers this is often the best option). If the person is unable to rest it may still be possible to rest the injured body part by –

Splinting

It will rest hand and finger wounds tissue is still being repaired.

Crutches

Walking with crutches (or even with a walking stick) – It will rest foot ulcers. Whatever the circumstances, the injured part should not be allowed to perform normal functions whilst the best option is for the person to spend as much time as possible, lying down with his foot raised above the level of his heart (bed rest). However, this is very rarely possible amongst people who must struggle to feed themselves and their families, so other options should be explored.

It is also very important to find out whether the person is able to change his activities so that he doesn't need to walk so much: for example, can he temporarily swap work with another person? Other transport options should also be considered: for example, riding a bicycle. Topical antibiotics need not be used in the treatment of ulcers in leprosy cases.

Treating the ulcer is a great opportunity to reduce fear & stigma through demonstrating ulcer care without any discrimination. Family members are also encouraged to learn and practice the dressing of ulcer and nursing care of patient.

Standard MCR Footwear use in leprosy:

Leprosy leads to nerve damage resulting in loss of sensation of feet. Because of this, feet develop plantar ulcers which can damage the foot and lead to deformities. Ulcers and deformities are the main reasons for stigma of leprosy. Appropriate footwear can protect feet, which have lost sensation from developing ulceration and consequent deformities.

The prescribed footwear should fulfill the following criteria

(1) Features:

- (a) **Acceptability:** The footwear should be acceptable to the patient. Designs which are locally acceptable can be adopted by changing the pattern and colour of straps.
 - (b) **Well fitting:** The footwear should fit snugly with no play between the foot and footwear. **Back-strap must be used in all anaesthetic feet in leprosy.** The straps should have Velcro for fastening and should be adjustable to accommodate dressing or swelling of the foot.
 - (c) **Durability:** The quality of MCR should be of acceptable standards with regard to shore and longevity. Similarly the straps should have a similar longevity as that of the MCR.
- (2) Specifications of Materials to be used:**
- (a) **Insole:** MCR should be used as an insole. MCR should not be too hard but have a shore of 15 degree. It should not be flattened, indented or hardened over a reasonable life of footwear (9/12-1 year). Different colours could be used to match outer-sole (under-sole).
 - (b) **Outer Sole:** The outer sole should be hard enough to prevent thorn/nail from piercing through it. It should be of light weight.
 - (c) **Upper Straps:** Upper straps should be made of soft leather with an appropriate underlining. The straps should not harden on contact with water.
 - (d) **Velcro:** Nails, buckles or clips should **NOT** be used. Only Velcro should be used as fasteners.

Rehabilitation need assessment and Referral:

The following are examples of interventions that may be available.

Problems	Rehabilitation interventions
<i>Anatomical:</i> Deformity of the hand	Reconstructive surgery and physiotherapy
Foot drop	Ankle-foot orthosis, reconstructive surgery
Amputation	Prosthesis
<i>Psychological:</i> Depression	Counseling
<i>Functional:</i> Limitation of fine hand movements	Occupational therapy
Mobility limitations	Crutches or wheelchairs
<i>Social participation:</i> Stigma in the family	Counseling

Problems	Rehabilitation interventions
Exclusion from community functions	Education and advocacy
Children with disability	Promoting inclusive education
<i>Economic:</i> Loss of employment	Vocational training and/or placement
Poverty	Micro-credit for self-employment

When to refer a case of severe reaction to tertiary care centre:

Complicated cases of reactions, which need to be referred to tertiary care centres may be –

- Those not responding to Prednisolone therapy
- Contraindications for Prednisolone therapy
- Recurrent / repetitive ENL reaction
- Lepra Reaction in children, pregnant woman, patient with diabetes, tuberculosis, osteomyelitis, infected ulcer, gastric or peptic ulcers
- Lepra Reaction with undiagnosed associated disease under investigations
- Lepra Reaction with nerve abscess or compressed nerve requiring surgical intervention

Functioning of District Nucleus Team for DPMR

District Nucleus Unit is the main coordination centre for activities under DPMR. The District Leprosy Officer / District Nucleus Medical Officer is the nodal officer of this activity and he is responsible to receive DPMR reports from Primary, Secondary and Tertiary centres on various aspects of the programme.

The role of the DNT will be:

1. District nucleus will receive all patients referred from primary level and after their registration these patients will be referred to concerned member of Apex Group for appropriate treatment. The treatment provided at secondary level will be coordinated and recorded in appropriate record by District nucleus for future follow up.
- District nucleus will also procure prednisolone and additional drugs, materials required for management of cases.

- District nucleus will maintain all records prescribed in the guidelines, for secondary level.
 - DN will screen cases for RCS, arrange RCS Camps and Workshops and also look after transportation and payment of incentives.
 - DN will be responsible for compilation of reports and its submission to state.
 - District nucleus will keep track with tertiary level institutions for services provision of referred cases and for their follow-up.
 - Overall programme planning, implementation, monitoring, supervision and training will be responsibility of DN.
2. The District nucleus will maintain a Register of all such cases referred by PHCs. The secondary level centres will send a list of all disability cases registered by them as referred by PHCs or directly to the District nucleus every for record. Similarly tertiary level centre will also send a list of all disability cases registered by them directly to the District Nucleus for record. Caution is to be taken to avoid duplication of recording same cases.
 3. While referring complicated cases from the secondary level to the tertiary level care centres, a copy of the referral slip will be marked to the District nucleus for record.
 4. Tertiary level care centres will intimate the District nucleus, the leprosy cases operated upon; through a monthly report for updating their record and to facilitate payment of expenditures if any, to the patient or the institution as per GOI rules.
 5. The District nucleus will be responsible to arrange procurement of all drugs and materials required under DPMR and supply to the primary, secondary and tertiary centres as per GOI rules.

Materials required at district level

Aids and Appliances

Protective aids (Goggles, eye shield): For using Lagophthalmos for protects from dust, sunlight and insects.	Pumice Stone/scrub: To remove the callous and hard skin.
Mittens, cotton glove, and Towels: To protect hands from heat to prevent burns	Lumbrical splints: To prevent weaknesses of intrinsic muscles and to sustain post-operative Lumbrical/functional position.
Cylindrical Splints: To prevent / release skin and joint contractures	Gutter Splints: To prevent inter-phalangeal joint contractures.
Dynamic Splints: To keep the fingers mobile to prevent contractures.	Adductor Band: To keep little finger in adduction position.
Posterior Slabs (arm): To immobile elbow joint	Posterior Slab (leg): To immobile knee joint and/or ankle joint.
Thumb Spica: To prevent the thumb web contractures. To protect thumb movements (Opponens to fingers)	Crutches: To assist non-weight bearing gait.

Physiotherapy Equipments

Wax Bath	To maintain the softness of the anaesthetic limbs
Semmes-Wienstein Filaments	Sensory testing
Soaking Tubs	For self-care practice
Walking Parallel bar	To monitor the walking styles (foot gait)

Materials and Equipment

Surgical Instruments	Shoe Unit Material	Details of Rooms	Physical arrangements
Autoclave	Leather Sewing Machine	Physiotherapy room size 18 x 12 ft	Two Long benches size 6x3x0.6 ft
Sterilizer	Grinding Machine (½ hp), grinding stone	Stock room size 10 x 10 ft	One Long table size 6x2x2.6 ft
Artery Forceps (Artery, Thumb, mosquito)	Iron shoe last, Gutum, Hammer, Big scissors	Shoe unit room size 12 x 10 ft with exhaust fan	Six Sitting stools (plastic)
Probe	Cutting blade, repair needles		Two tables
Surgical Scissors	Leather cutting knives, nose blare		Two chairs
B P scalpel Handles size no. 4 and blade size 21	Punch scar, curved edged knife, hole punch		
Needle holder and Stitch remover	Highlight punch, press machine		
POP cutter (Manual)	Saw blade with stand		
Steel Tray with lid	Wooden loses no. 5–10		
Kidney Tray	Oil Stones		
	Harris mat		
	MCR sheets, Leather, Outer sole material, Velcro, resin pasting solution, thread, buckles		

Training Requirements

Training will be needed for the Dermatologists, Physician, Ophthalmologist, Orthopaedic surgeons, physiotherapy technicians and lab. technicians as appropriate and needed under the program.

Operational **guidelines and DPMR–training module cum manual** for the district hospital and district nucleus will be provided.

Organizing training

District nucleus will assess the training needs of GHC staff engaged in NLEP work and will be responsible for arranging formal & on the job trainings. Trainers will consider the following points.

1. Plan for preparations, conducting and follow up of training courses should be prepared by the district in consultation with the State Leprosy Officer
2. Prepare ‘learning objectives’ according to job / task given to trainee / different category of staff and then design the curriculum
3. Concentrate on ‘how to achieve learning objectives’ through active learning process
4. Select appropriate teaching method for each session e.g. case demonstration, role play, group exercises, case study etc. Select the content and teaching aids required
5. Try to remove barriers / factors distracting learning
6. Evaluate the training course, assess the participant’s reaction & learning at the end of the course and later on evaluate the performance on the job and effect of training after few months.

Supervision & Monitoring

The District Nucleus under the DLO will monitor the DPMR activities at the secondary level.

The health care professionals should know the definitions and be able to differentiate between commonly used terminologies in the management of programme, such as supervision, monitoring and evaluation.

Supervision:

It is systematic process for increasing the efficiency of health workers by developing their knowledge, Perfecting their skills, Improving their attitudes towards their work and increasing their motivational levels. Supervision is extension of training, intensified immediately after training, to ensure that health workers have fully acquired the skills taught and to provide any guidance needed.

It is carried out in direct contact with the health worker and it is aided by programme monitoring.

All health workers need help to solve problems and overcome difficulties. They also need feedback on their performance and encouragement in their work.

Supervisory visits to health units by the District Nucleus Team

He should visit CHC/PHCs to verify records, reports and for validation of data at least once in a month.

He should randomly validate some cases quality of diagnosis and management.

He should provide hands on training to PHC/CHC/Sup/HW during supervisory visits.

He should visit cases with disability to verify self-care practice carried out by patient.

He should verify the use of splints. Self-care kits, MCR footwear and other physical aids as well as make a need assessment.

He should interact with ASHA, GKS members and patients and community to know the awareness regarding program.

He should visit few RCS cases to know the outcome of operation.

Monitoring

The main objective of monitoring is to identify and resolve operational problems as soon as they emerge. Realistic solutions to operational problems will call for identification of causes and corrective action. Monitoring is essential for the following.

- to ensure implementation of planned activities
- to measure the results through indicators
- to check the records for correctness and completeness
- to check the reports & compile them
- to conduct review meetings

Secondary Level Job Responsibilities:

Job responsibility of DLO / DNMO in District Nucleus Team:

- Assist in planning & implementation of all NLEP activities in the district
- Ensure timely submission of Monthly Progress Report (MPR) by Block PHCs to the district and its compilation
- Ensure MDT, Prednisolone, foot-wear and other logistics are indented properly at all levels
- Cross check newly detected cases with their disability status, in the district
- Ensure good liaison with the Dermatologist and members of District Apex Group, Tertiary institutions and State Leprosy Cell as well as peripheral institutions
- Visit District Hospital and a reasonable sample of Block PHCs, Sector PHC and Sub-centres every month and submit an action taken report on integration, SIS Implementation, MDT stock management, case validation, Physiotherapy services, skin smear examination, IEC, DPMR & RCS activities, etc.
- Ensure that all the reports of the districts are timely submitted to the state
- Provide technical and operational support to all the peripheral health institutions in the district using different innovative approaches

Job Description of Physiotherapist/physio-technician

Job responsibilities

1. Undertake regular nerve function assessment and record the same
2. Maintain individual patient record and prioritize them according to the frequency of follow-up needed
3. Provide relevant physiotherapy for patients with deformities and ulcers
4. Teach self-care and provide information and demonstrate exercises to be carried out at home
5. Ensure pre and post-operative management and RCS referrals
6. Ensure podiatry applications, self-care demos and provide supplementary aids
7. Liaise with health staff and district nucleus staff for smooth coordination
8. Update records & registers and submit periodical reports to the concerned

Job Description of Footwear Technician

Job responsibilities

1. Take the foot measurements, design and make footwear
2. Ensure proper alteration or repair of footwear
3. Proper storage of finished products and ensure its safety
4. Ensure prompt delivery of finished products
5. Report to the Medical Officer on the adequacy of stocks well in advance
6. Ensure safe disposal of waste materials
7. Submit periodic reports to concerned authorities

Records & Reports

Records to be maintained at Secondary level are as under:

(a) District Hospital (District Referral Centre)

- Disability Register: Form – S 1
- Disability Assessment Form: Form – S 2
- Record of Lepra Reaction & Neuritis: Form – S 3
- Prednisolone Card: Form – S 4
- Referral Slip: Form – S 5
- Record of Disabled / Complicated cases at District referral Centre: Form – S 6

(b) District Nucleus

- Disability Register with District Nucleus: Form – S 7
- Monthly progress report from district to state: MLF 05 (Page-2)

IMPLEMENTATION OF DPMR SERVICES AT TERTIARY LEVEL

Objectives for tertiary care centers

- To provide DPMR services (mainly RCS) with provision of aids and appliances.
- To hold camps and workshops for clearing of backlog of cases in need of RCS and training of surgeons.
- To integrate DPMR/RCS services in to medical colleges, PMR institutes and District hospitals.

Tertiary Level Institutions - Apex Centers

South:

- (i) CLTRI, Chengalpattu, Tamil Nadu
- (ii) DFIT Hospital, Nellore, Andhra Pradesh
- (iii) CMC Vellore, Tamil Nadu
- (iv) SLR&TC, Karigiri, Tamil Nadu

North:

- (i) JALMA, ICMR, Agra, Uttar Pradesh
- (ii) TLM Hospital, Naini, Uttar Pradesh
- (iii) TLM Hospital, Shahadra, Delhi
- (iv) Plastic surgery department, medical college Lucknow

East:

- (i) PMR Department, Patna Medical College, Bihar
- (ii) TLM Hospital, Kolkata
- (iii) RLTRI Raipur
- (iv) Leprosy Home and Hospital, Cuttack

West:

- (i) J.J. Hospital, Plastic Surgery Department, Mumbai, Maharashtra
- (ii) All India Institute of Physical Medicine & Rehabilitation, Mumbai, Maharashtra

Other support units

1. Orthopedics and plastic surgery department of medical colleges
2. Identified NGO institutions
3. All national institutes under Ministry of Social Justice and Empowerment
4. Contractual surgeons skilled in RCS and Rehabilitation Programme
5. All PMR Institutes and dermatology, ophthalmology, microbiology, pathology departments of medical colleges
6. Leprosy Research Institutes

State/UT wise GoI recognized Reconstructive Surgery (RCS) Centres

State	District	Sr. No.	RCS CENTRES	
			Government	NGO
Andhra Pradesh	Chhittor	1		Emmaus Swiss Referral Hospital & Leprosy Project
	Rajamundry	2		Rural India Self-Development Trust
	Nellore	3		Urban Leprosy Centre
	West Godavari	4		The Leprosy Mission Hospital, Narsapur
		5		Damien Leprosy Center, Vegavara, Gopannapalem, Eluru
	Hyderabad	6		Sivanand Rehabilitation Home
	Vizianagaram	7		Philadelphia Leprosy Hospital
	East Godavari	8		The Leprosy Mission Hospital, Ramchandra Puram
	Guntur	9		GRETNALTES, Morampudi, district Guntur
	Secunderabad	10	Gandhi Medical College & Hospital	
Sub-Total	10		1	9
Assam	Guwahati	11	Guwahati Medical College & Hospital	
	Sonitpur	12		Catholic Hospital Charitable
Sub-Total	2		1	1
Bihar	Muzaffarpur	13		The Leprosy Mission Hospital
	Patna	14	Patna Medical College	
	Dharbhanga	15	Dharbhanga Medical College	
Sub-Total	3		2	1
Chhattisgarh	Janjgir	16		Bethesda Leprosy Home and Hospital
	Bilaspur	17		Chandkhuri Leprosy Hospital and Home
	Raipur	18	Regional Leprosy Training & Research Institute	
Sub-Total	3		1	2
Chandigarh	Chandigarh	19	Government Medical College	
Sub-Total	1		1	0
Delhi	North East Delhi	20		The Leprosy Mission Hospital, Shahdhara
Sub-Total	1		0	1
Goa	Panaji	21	Goa Medical College Hospital	
Sub-Total	1		1	0
Gujarat	Vadodra	22	S.S.G. Hospital	
	Ahmedabad	23	Civil Hospital	
Sub-Total	2		2	0
Haryana	Rohtak	24	Post Graduate Institute of Medical Scince	
Sub-Total	1		1	0

State	District	Sr. No.	RCS CENTRES	
			Government	NGO
Jharkhand	Ranchi	25	Regional Institute of Medical Science	
	Jamshedpur	26	MGM Medical College Hospital	
	Ranchi	27		Radharani Rehabilitation Centre *
	Giridih	28		Holy Cross Hospital
Sub-Total	4		2	2
Karnataka	Dharwad	29		Hospital for Handicapped, Hubli
	Tumkur	30		Sri Ramakrishna Sewa Ashram SVIRHC, Pavagada
	Belgaum	31		The Leprosy Mission Hospital, Vengurla Road, Hindalga
Sub-Total	3		0	3
Madhya Pradesh	Khargaon	32		St. Joseph Leprosy Centre, Sanawad
	Bhopal	33	Government Medical College Hospital	
	Jabalpur	34	Seth Govind Das Govt. District Hospital	
Sub-Total	3		2	1
Maharashtra	Mumbai city	35	Acworth Municipal Hospital for Leprosy Wadala, Mumbai*	
		36		Sishu Prem Samaj, 101/C – Mountana Building, Road No- 2, Lokandwala Complex, Andheri West
		37	All India Institutes of Physical Medicine and Rehabilitation	
		38	Grant Medical College & J.J. group of hospitals*	
		39		Vimla Dermatological Centre, Yari Road, Varsova,
	Nagpur	40		N.K.P. Salve Institute of M.S. and Lata Mangeshkar Hospital,
	Amravati	41		Kothara Leprosy Hospital, P.O. Paratwada, District Amravati
	Sangli	42		Richardson Leprosy Hospital, Miraj, District Sangli
	Raigad	43		
	Parbhani	44	Civil Hospital, Parbhani	
	Dhule	45	Medical College, Dhule	
	Aurangabad	46	Medical College, Aurangabad	
	Bhandara	47	Govt. General Hospital	
	Pune	48	Dr. Bandorwalla Leprosy Kondwa, Yevalewadi	
Pune	49	Sasoon Hospital		
Sub-Total	14		9	5

State	District	Sr. No.	RCS CENTRES	
			Government	NGO
Manipur	Imphal	50	Regional Institute of Medical Sciences	
Sub-Total	1		1	0
Orissa	Cuttack	51	Cuttack Medical College Hospital	
		52	Leprosy Home & Hospital Cuttack	
	Ganjam	53	Berhampur Medical College	
	Sambalpur	54	V.S.S. Medical College & Govt. Hospital, Burla*	
	Jharsuguda	55	District Hospital *	
	Rayagada	56		HOINA Leprosy Research Trust, Muniguda
	Baragarh	57		Mission Hospital, Baragarh
	Mayurbhanj	58	District Hospital	
	Sonepur	59	District Hospital	
	Bhubaneswar	60		Hi-tech Medical College & Hospital
		61		SSB Hospital
		62		IMSS & SUM Hospital
	Koraput	63	District Hospital	
	Bolangir	64	District Hospital	
Sub-Total	14		9	5
Puducherry	Puducherry	65	General Hospital	
Sub-Total	1		1	0
Sikkim	Gangtok	66	STMN Govt. Hospital	
Sub-Total	1		1	0
Tamilnadu	Vellore	67		Schieffelin Leprosy Research & Training Centre, Karigiri
	Tanjore / Thanjavur	68		Sacred Heart Leprosy Centre, Sakkotai
	Tiruchiorappalli	69		Holy Family Hansensorium, Fathimanagar
	Salem	70		Leprosy Relief Rural Centre, Chettipatty
	Chennai	81		GREMALTES, Shenoyanagar
	Villupuram	72		The Leprosy Mission Hospital, Vadathorsalur
	Sivaganga	73		Dayapuram Leprosy Centre, Manamadurai
	Kancheepuram	74	Central Leprosy Teaching & Research Institute, Chengalpattu	
	Chennai	75	Stanley Medical College Hospital	
Sub-Total	9		2	7

State	District	Sr. No.	RCS CENTRES	
			Government	NGO
Uttar Pradesh	Faizabad	76		The Leprosy Mission Hospital, Motinagar
	Allahabad	77		The Leprosy Mission Hospital, Naini
	Agra	78	JALMA – ICMR	
	Lucknow	79	King George Medical College	
	Varanasi	80	Pt. Deen Dayal Upadhyay Hospital	
Sub-Total	5		3	2
Uttarakhand	Dehradun	81	District Hospital Dehradun	
Sub-Total	1		1	0
West Bengal	Purulia	82		Purulia Leprosy Home and Hospital
	Kolkata	83	SSKM Hospital	Premananda Memorial Leprosy Hospital
		84	R.G. Kar Medical College	
		85	N.R.S. Medical College	
	Midnapur West	86	Jhargram S.D. Hospital	
	Burdwan	87	Durgapur S.D. Hospital	
	South Dinajpur	88	Balurghat District Hospital	
	North Dinajpur	89	Raiganj District Hospital	
	Coochbehar	90	MJN District Hospital	
Sub-Total	10		8	2
Total	90		49	41

Guidelines for Surgeons

Reconstructive surgery aims to restore function and form as far as possible and to prevent further disability. It also plays an important role in the prevention of disability and rehabilitation process. Some patients can benefit from reconstructive surgery but not all patients are suitable. Pre and post-operative physiotherapy is essential for a successful outcome of surgery and needs to be arranged. Leprosy leads to physical, functional, social and/or economic problems. Physical rehabilitation includes physiotherapy and occupational therapy, orthotics and prosthetics services, assistive and protective devices and reconstructive surgery. Persons affected by Leprosy with disability and deformity can be referred to specialist for surgical correction.

The following are the major points in the guideline on RCS:

- Besides completion of treatment and being free from reactions, the joints should be mobile. In case any stiffness is noted pre-operative physiotherapy and splintage needs to be carried out.
- In case patient is undergoing nerve decompression surgery for neuritis the corticosteroid treatment should be stopped at least before 2 to 3 weeks. Despite that anesthetist or the operating surgeon must be aware of patient having been on steroid therapy. A single dose of steroid at the time of surgery may prevent any complication arising. Post operatively too if any problems due to steroid withdrawal is encountered patient must be given steroid overriding the fact of delayed healing or marred result. By and large, for tendon transfers patient should not be undergoing steroid therapy and should have completed steroid therapy at least six months prior to being taken up for surgery.
- There should be no focus of infection like ulcer or blister on the limb to be operated. The patient should not have any complicated ulcers of the other limbs or in another part of the body.
- The patient should be willing to be admitted for the surgery, be willing to spend one week preoperatively for physiotherapy if indicated and three weeks in plaster cast and later be admitted for a period of four weeks for post-operative physiotherapy. He may go home in between these periods with the permission of surgeon. For the foot drop the duration must be at least one year of deformity and it may take as long as six weeks in plaster and another six weeks for physiotherapy.

- In cases of contractures or restricted mobility, the surgeon may decide on surgical and or non-surgical like serial POP splintage or continuous use of dynamic (elastic) gutter splints to release these contractures, make the skin soft and then take the patient up for tendon transfer surgery.
- In the cases with lagophthalmos if cornea is exposed and there is threat to eye, immediate surgery of tarsorrhaphy may be done overriding other precautions but for tendon transfer same rules like hand apply. Only different advice is that he/she will be put on liquid diet for three weeks post-op. However, some recent operations (not tendon transfers) do not need such advice.
- Resurfacing for sole of the foot for plantar ulcer may require much longer duration of hospitalisation for skin graft or flap cover and patient shall be informed about the same.
- While operating on the nose for collapsed or depressed nose a good clinical examination is necessary to rule out presence of ulcers in the mucosa. As this deformity generally occurs in MB and smear positive cases, they should have completed at least 12 months of MDT and duration of collapse also should be longer than 12 months. A negative nasal smear report is must before surgery.
- Septic surgery threatening the life of patient like gangrene may be dealt with as emergency in septic OT and previously mentioned guidelines do not apply to these cases.

Criteria for Surgical Management

- Unemployed - RCS
- Employed + deformity but NO handicap - Cosmetic reasons
- Employed + deformity + handicap - RCS for function
- Rehabilitated patient with problems - Minimum surgery
- Female patient + household problems - surgery for ADL

Deformities requiring RCS

Primary Deformities

Primary deformities arise due to involvement of peripheral nerves or follow the infiltration of the skin or mucosa by *M. leprae*. Neural involvement is generally seen in the tuberculoid type while mucosal and cutaneous involvement is seen in the lepromatous type. However, nerves can also be involved in the lepromatous type during the episode of reaction as well as at a later stage of the disease. In the neuritic type, primary and/or early affection of the nerves may occur.

The examples of primary deformities which result from neural involvement are claw hand, foot drop and lagophthalmos. Cutaneous involvement leads to the loss of eyebrow, wrinkling or sagging of facial skin and thickening of ear lobules. The nasal mucosal involvement and its subsequent sequelae produce the characteristic depressed nose. All these features constitute the prominent stigma of the disease.

Secondary Deformities

Secondary deformities occur due to failure of realisation that the anaesthetic areas such as the hands, feet and cornea require special attention. Deformities of hands occur following unnoticed and uncared for injuries that may result from burns due to holding hot utensils, pressure necrosis, injuries at work, etc. the anaesthetic skin being dry, cracks easily and secondary bacterial infection in these cracks leads to formation of abscesses, inflammation of synovial sheaths, or osteomyelitis of the phalanges.

In the foot, plantar ulcers occur due to pressure damage and other unnoticed accidental injuries. These ulcers if neglected lead to osteomyelitis with sequestrum formation and finally shortening of the limb. In affection of eyes, keratitis, corneal opacities and other eye complications are likely to occur due to suppression of blinking reflex or due to lagophthalmos.

Reconstruction of sole following plantar ulcers

In the recent years lot of momentum is gained for resurfacing the sole of the foot following plantar ulcers. Right from skin grafts to local transposition flaps, from myocutaneous flaps to neurovascular island pedicle flaps have revolutionised the surgery for plantar ulcers. Therefore, it is important to understand that such cases may need prolonged hospitalisation, immobilisation in the POP casts, walking with crutches for non-weight bearing even while in the hospital and specialised footwear after healing has taken place.

Charcot's foot

The clinician should remember that the most common problem affecting the anaesthetic foot and ironically the most commonly overlooked diagnosis is that of acute neuropathic disintegration of the foot or chronic neuropathic disintegration of the foot. The patients do not complain of any problem or it may be only of swollen foot. On palpation, if the foot is warm or 'hot' this is the earliest sign of the hot foot. The condition should be suspected whenever a swollen anaesthetic foot is seen and is confirmed by palpation. Regardless of X – ray findings treatment should be immediately instituted otherwise the ankle may dislocate and present with an ugly abnormal foot which may finally end up in an amputation. The management includes total contact POP cast for 2-3 months followed by graduated walking (Partial Weight Bearing–full Weight Bearing) and watching for recurrence of swelling or heat. If it recurs, then POP should be reapplied and patient will probably require a Fixed Ankle Brace (FAB).

Nerve decompression surgery

It has been established that peripheral nerves pass through the fibrous tunnel at certain points in their course. The sites of predilection of nerve affection in leprosy are near these tunnels. Being an anatomical structure it does not expand to accommodate the thickened nerve and thereby causes compression on the nerves resulting in the loss of conduction power of axons.

Ideally, if in leprosy nerves can be treated early deformities can be prevented. Nerve decompression is one such modality which is used by the surgeons to get some results in cases with compression and no improvement with steroid therapy. Its indications are varied but can be summarised as to relieve pain and tenderness, drain an abscess and if there is deterioration in nerve function. Patient may or may not be on MDT or in reaction as its outcome is not dependent on it.

Patients who have chronic pain and swelling in peripheral nerves which does not respond to analgesics and a course of steroids should be considered for nerve decompression.

Indications for Surgery in Brief

- 1. Diagnostic: skin and nerve biopsy.*
- 2. Prevention of primary deformity – : nerve decompression.*
- 3. Correction of primary deformity.*
- 4. Cosmetic Reasons*
 - Depressed nose*
 - Facial wrinkling*
 - Ear lobule*
 - Loss of eyebrows*
 - Empty thumb web space*
- 5. Functional Benefits*
 - Ulnar claw hand*
 - Total claw hand (thumb deformity)*
 - Foot drop*
 - Claw toes*
 - Lagophthalmos*
- 6. Correction of Secondary deformities*
 - Plantar ulcers*
 - Contractures*
 - Joint stiffness*
 - Post-operative complications*

List of Instruments Required for RCS

1. Tendon Tunneller 13" cvd	2 Nos.
2. Tendon Tunneller 13" st	2 Nos.
3. Tendon Tunneller 7" cvd	2 Nos.
4. Tendon Tunneller 7" st	2 Nos.
5. Tendon hooks	2 Nos.
6. Skiin hooks	4 pairs (8 Nos.)
7. Metzebaum scissors 5" cvd, fine	4 Nos.
8. Metzebaum scissors 7" cvd	4 Nos.
9. Metzebaum scissors 7" st	4 Nos.
10. Adson's forceps - toothed	6 Nos.
11. Thumb forceps 6" toothed	4 Nos.
12. SS Spatula (as per sample)	2 Nos.
13. Artery forceps 5" (mosq – fine)	8 Nos.
14. Artery forceps 6" cvd,ord	6 Nos.
15. Artery forceps 6" st,ord	8 Nos.
16. Artery forceps 5" (mosq – rt. angled)	2 Nos.
17. Kocher's forceps 6"	4 Nos.
18. BP Handle No. 3	4 Nos.
19. BP Handle No. 4	4 Nos.
20. Fascia lata stripper	2 Nos.
21. Senn's retractor	4 Nos. (2 pairs)
22. Cat's paw retractor	4 Nos.
23. Iris scissors cvd	2 Nos.
24. Needle holders	8 Nos. (2 fine & 2 blunt)
25. Plaster cutting scissors (as per sample)	4 Nos.
26. Heath's suture cutting scissors	4 Nos.
27. Engel's Plaster cutting saw	4 Nos.
28. POP Shears	2 Nos. (1 Bohler & 1 Guy's shears)
29. Plaster cast spreader – Henning	2 Nos.
30. Plaster bender – Bohler	2 Nos.

Outreach Services for DPMR and RCS

Organisation of Camps

Recently, there has been increasing focus on reaching expert services to the grass root level through camps. These camps are basically of two types. One is where disabled patients are rendered services as well as patients in need of RCS are identified and referred to nearby tertiary care center. Another type of camp is for carrying out training of local surgeons at their own set up by sending a team of surgeons and holding the RCS camp in which few demonstration surgeries are performed. The following tasks are undertaken at RCS selection and DPMR service camps.

Assessment of risk status

Patients with multiple skin patches, painful nerves, reactions etc. are at high risk for developing disability. A separate list is made and given to district authorities for their follow up. Children are examined separately by senior doctor. 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.

Providing DPMR services

Besides teaching physiotherapy in group and providing splints to hand deformity cases, few patients with absorption of fingers may need Instant Grip-Aid Kit.

Instant Grip-Aids

These are required mainly for patients staying in colonies and have long term leprosy with advanced deformities of the hand. With absorption and amputations of fingers they face difficulty in holding and using articles of daily use like for eating, drinking, brushing teeth, combing, toilet visits etc. The “Instant Grip-Aid Kit” is a tremendous boon for such cases. This kit is also used to overcome handicap in other disabilities like burns and amputation of fingers thereby, integrating its use in the standard tertiary care hospital.

Patients with foot drop are given the foot drop splint and patients suffering from ulcers are provided with self-care kit. These patients are then given a demonstration on the use of the self-care kit. Each of these patients with ulcers on the foot is also provided with MCR footwear at the camp. Tertiary care institutes need to have liaison for getting MCR footwear.

Instant Grip-Aid Kit for advanced hand deformity



Self-Care Kit / Ulcer dressing kit

Most patients are very poor and cannot afford to buy the materials needed to care for their feet. Providing patients with the self-care kit free of charge overcomes this obstacle.

The self-care kit motivates patients to take care of their feet and gives them the tools to do so. It also has a very positive synergistic impact, as they witness the improvement and are motivated to continue to use it. They also feel more in control of their disabilities and remove their self-perception as an “invalid” who needs to visit a clinic or doctor regularly.

In the event of a recurrence, the patient knows how to deal with it and uses any remaining materials from the kit and contacts the health services immediately, thereby promoting healing in a shorter period and preventing worsening of the disability.

Patients may become dependent on the service provides for replacement and a discontinuation in the supply may lead to a sense of dejection/rejection. Hence follow-up services must be an integral part of the program. As the kit is useful in any home, there is often a demand for it as a “first aid kit”. Pilferage of kits may occur at all levels of distribution, leading to the escalation of costs.

Precaution

It must be understood that the self-care kit is not meant for large ulcers which at once can be recognised as in need of surgery. It may be used without scraper as dressing material till admission for surgery, particularly for chronic ulcers as seen in patients residing in leprosy colonies. On no account expectations are raised by cure with the kit in such cases.

MCR footwear

Special MCR foot-wear is not recommended routinely for all patients. Any suitable foot-wear with prerequisites such as soft inner sole, hard outer sole (to prevent piercing of thorns/nails), that fits snugly and also has adjustable straps preferably with a back-strap can be used. The foot-wear should be stuck or stitched by thread and not by nails. Also it should be comfortable, locally available and socially acceptable of different designs. However, if there is a provision available for MCR then it should be indented as per the number of cases with grade 1 & grade 2 disabilities of foot.

Goggles & Loose Materials

Patients with lagophthalmos are given the goggles and advised as necessary to prevent corneal ulceration. There are also such patients who require only some loose materials. Accordingly some Vaseline, liquid paraffin, oil, gauze pieces, anti-septic ointments etc. are also taken and distributed at the camps.

Minimum 50 patients are expected to attend each of these DPMR camps. All these patients are followed up monthly to substitute the given materials and are assessed for the result after four months. It is only the regular services which increase the confidence of patients and family in the health system. They tend to come forward easily later on if they have any problems.

Selection for RCS

All patients with deformities and mobile joints fall in to category for selection of RCS provided they have fulfilled the other criteria. They are given a date for operation and referred to the tertiary care center or district hospital as decided earlier between chief surgeon and superintendent of the hospital.

Basic Tasks for RCS Training

- Differential diagnosis and reaching the diagnosis of leprosy by clinical examination, skin smears and histopathology of skin or nerve biopsy.
- Management of complicated cases of MDT, Lepra Reactions and relapse.
- Charting of Nerve Impairment after clinical examination and investigations, grading of disability and EHF Score of disabilities of hands, feet and eyes.
- Physiotherapy and physical aid materials; splints, grip-aids, self-care kit, foot drop splint, crutches, walking POP cast etc.
- RCS: Criteria for selection of cases, surgical procedures in brief and guidelines on pre and post-operative care, regular follow up.
- Outreach services and organisation of camps.
- Maintenance of records and relay of information for NLEP.
- Developing interdepartmental co-ordination and linkages with vocational and occupational rehabilitation agencies and socio-economic rehabilitation.
- Training of primary and secondary level staff at tertiary care institutes.
- Training curriculum and its duration to be decided by core committee for each category. Training to be given by resource persons from established surgical units with demonstrations and trainee assisting the operations.

Logistics and Supplies

All tertiary care institutes should have:-

1. Fully equipped operation theatre and Medical Rehabilitation Centre.
2. All instruments, gadgets, aids and appliances required.
3. Adequate stock of Medical supplies like steroids, loose Clofazimine, Thalidomide, POP, dressing material etc.

Procurement of materials

The State Leprosy Societies will procure all materials required under DPMR plan and arrange to supply same to the concerned Govt. and Non-ILEP institutions through the concerned District Leprosy Society as decided by the State Implementation Committee. Concerned ILEP organization will procure all materials required for their respective tertiary care centres.

Drugs

Prednisolone, Loose Clofazimine, Thalidomide and other supportive drugs.

Prednisolone

Reactions in Leprosy are medical emergencies. Immediate treatment is essential to prevent disability. Steroids are the drug of choice in managing Leprosy – reactions, usage in the form of Prednisolone is desirable. Total number of 5 mg tablets of Prednisolone, required to treat an episode may be 336-462-518 tablets as per the recommended schedule of 3-6 months.

Loose Clofazimine

It should be made available in loose form as 100 mg capsules apart from its routine availability in MDT Blister Calendar Packs. It has good anti-inflammatory properties in 300 to 400 mg per day in divided doses. But it takes nearly a month to act hence steroids should be the first line of treatment. Clofazimine is useful especially in weaning a patient from steroid therapy. Also it can be combined with steroids in patients who require prolonged doses of steroids to control repeated reactions. It should be started as thrice daily for one/two months, twice daily for one and tapered off.

Thalidomide

It is an effective drug in the treatment of severe ENL in leprosy. Thalidomide must be administered under the strictest possible supervision. Procurement of Thalidomide and its use may be as per GOI directions.

Other supportive drugs

Antacids, H2 receptor blockers, de-worming tablets, calcium supplements, soluble insulin for diabetic patients, antibiotics etc. requirement needs to be anticipated and kept ready.

Physical Aid Materials

Provision of splints, crutches, grip-aid, self-care kit etc. is also required in most of the cases and these should be arranged depending on the total load of grade 2 cases in the community. Supply chain, particularly for MCR footwear distribution twice in a year needs to be established.

ANNEXURES OF FORMS

Form T-1: Disability register

Form T-2: Record form for Disability & Nerve Function Impairment, Motor and Sensory

Form T-3: Lepra reactions

Form T-4: Prednisolone card

Form T-5: Record of cases at tertiary level

Form T-6: Special discharge card with follow-up

Form T-7: RCS follow-up form

Form T-8: RCS monthly report form

Form T-9: Monthly report of Grade II cases registered directly at tertiary care institutes.

Form T-10: Record of patients on Thalidomide treatment

Form P1/S1

Disability Register

PHC/ CHC _____ District _____ State _____

Sr. No.	Name of the patient	Age/ Sex	Address Village/ Sub-centre/ PHC	New UTI/Old Case	MB/ PB	New Case (NC)/ UT case/ RFT	Disability Gr.-I/II	Site of disability					
								Eye		Hand		Foot	
								Gr-0	Gr-II	Gr-I	Gr-II	Gr-I	Gr-II
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Ulcer Simple/ Complicated	EHF	Neuritis	Reaction/ Type-I/ Type-II	DPMR Services Provided				Refer to secondary with date			
				Steroid/ dose/ duration	Self-care practice	Ulcer Dressing	Other if any	RCS	Complicated Ulcer	Eye	Reaction not responding to steroid
15	16	17	18	19	20	21	22	23	24	25	26

New Disability developed after starting of prednisolone			Referral Services provided/ Follow up taken up/Remarks
Eye (Gr-II)	Hand (Gr-I/ Gr-II)	Foot (Gr-I/ Gr-II)	
27	28	29	30

Form P2/S2/T2

Disability Assessment form Assessment of Disability & Nerve Function

Name..... Village Dt. of Regn

S/o.W/o.D/o..... Sub Centre Dt. of RFT.....

Gender/Age MDT No..... Referred by





















Occupation MB/PB..... Date of assessment

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 = Paralysed	Score of vision: counting fingers at 6 meters 0 = Normal 1 = Blurred vision 2 = Unable to count fingers
---	---

This form should be filled-in at the time of registration and repeated after 3 months (once in 2 weeks in case of neuritis/reaction)

SENSORY ASSESSMENT

DATE / ASSESSOR	Palm		Sole		Comments
	RIGHT	LEFT	RIGHT	LEFT	
					
					
					
					
					

Key : (Put these mark/icon on the site where lesion is seen)

✓ Sensation Present within 3 cms	S Contracture	● Scar/Callus
X Anaesthesia	⊗ Wound	⊥ Shortening Level
∧ Clawing	≡ Crack	

Form P3/S3/T3

Record of Lepra Reaction / Neuritis Cases

Name of Hospital District State

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		Neuritis	
						I	II	Y	N

Col. No. 7					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
from								
upto								

How to fill the Form T III

- 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, Mebandazole, or any other drug given

P4/S4/T4 - Prednisolone Card

Prednisolone Card
(This card should be kept with the patient)

Other drugs issued

.....

.....

.....

Progress / Remarks

.....

.....

.....

Signature of MO

Name

Place

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.....

- 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 impletion of regimen, even if there is improvement or deterioration.

PREDNISOLONE RECORD

Dosage	Date of issue	Next due date	Signature
40mg x 2 wk.			
30mg x 2 wk.			
20mg x 2 wk.			
Do (if required)			
15mg x 2 wk.			
Do (if required)			
10mg x 2 wk.			
Do (if required)			
5mg x 2 wk.			
Do (if required)			

Form P5/S5

Form – P-III

Referral Slip
(To be used by ASHA/HW/MO PHC/MOCHC)

Name of Hospital District Date

Name of the person to be referred :
SL. No. in referral register :
Age and Sex :
Address :
.....
.....
Clinical finding :
.....
.....
Reason / indication for referring :
.....
.....
Referred to.....
Referred by :
(Designation & place/Signature)
Action taken at referral centres:.....
Instructions for follow up:.....
.....
.....
Referred back by
(Dr. Designation & place
)
Signature & date:

MLF 04 - (Page 2)

NLEP – Monthly Progress Report PHC / Block PHC / CHC to District

Name of PHC / BLOCK PHC / CHC _____

Month _____

Sr. No.	DPMR activity	During the month	Cumulative total From April till date
1	No. of Reaction cases recorded		
2	No. of Reaction cases managed at CHC –		
	at District Hospital –		
3	No. of suspected relapse cases referred		
4	No. of Relapse cases, confirmed at district hospital		
5	No. of patients provided with foot-wear		
6	No. of patients provided with self-care kit		
7	No. of patients referred for RCS to tertiary units		
8	No. of patients – RCS done		
9	No. of ulcer case managed		
10	No. of ulcer case referred to secondary level		
11	No. of cases developed new disability		
12	No. of cases provided regular MCR footwear		
13	No. of cases referred for customised footwear		
14	No. of cases referred for skin smear examination for AFB to secondary level		
15	No. of cases found AFB + ve		
16	No. of ASHA/HW trained		
17	No. of new cases referred / confirmed by ASHA		

MLF 05 - (Page 2)

NLEP - Monthly Progress Report (From District to State)

District _____ Month _____

Sr. No.	DPMR activity	During the month	Cumulative total From April till date
1	No. of Reaction cases recorded		
2	No. of Reaction cases managed at CHC –		
	at District Hospital –		
3	No. of suspected relapse cases referred by PHC		
4	No. of Relapse cases, confirmed at district hospital		
5	No. of patients provided with foot-wear		
6	No. of patients provided with self-care kit		
7	No. of patients referred for RCS to tertiary units		
8	No. of patients – RCS done		
9	No. of ulcer case managed		
10	No. of ulcer case referred to secondary level		
11	No. of cases developed new disability		
12	No. of cases provided Gr-I MCR footwear		
13	No. of cases referred for Gr-II MCR footwear		
14	No. of cases referred for skin smear examination for AFB to secondary level		
15	No. of cases found AFB + ve		
16	No. of cases attended DPMR clinic		
17	No. of ASHA / HW trained		
18	No. of new cases referred / confirmed by ASHA		

Form S6

Record of Disabled / Complicated Cases treated at District Referral Centre

District hospital _____ State _____

Date	Sr. No.	Name of Patient	Age / Sex	Address	Referred by / Direct	Disability / Complication	Treatment	Remarks
1	2	3	4	5	6	7	8	9

Form S7

Disability Register with District Nucleus

District _____ State _____

Sr. No.	Name of Patient	Age / Sex	Address	Registered at (PHC / DH)	Date of Regn.	Type of Deformity				Action Taken
						Eye	Hand	Foot	Ulcer	
1	2	3	4	5	6	7	8	9	10	11

Disability Register

Name of the Hospital _____ District _____ State _____

Sr. 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

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					

How to fill up the Form T 1

- 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 MD 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, contractural developed, vision deteriorated new nerve damaged noticed etc.

Form T5

Record of Disabled / Complicated Cases treated at Tertiary Level

Name of the Hospital _____ District _____ State _____

Date	Sr. No.	Name of Patient	Age / Sex	Address	Referred by / Direct	Diagnosis	Services Provided	Status at discharge, with date / Referred back to
1	2	3	4	5	6	7	8	9

Form T6

Discharge slip with follow-up instructions

Name of the Institution _____

Name of the Patient _____

Age _____ Sex _____

Address _____

Referred From _____

Indication / complication for which referred _____

Investigation done and reports _____

Treatment given _____

Instructions to follow _____

Name and Signature of MO / Supervisor _____

Date of Discharge _____

Form T7

Postoperative Follow up of RCS in Leprosy

Name of the Institute:.....Hosp. / MDT No:.....

Name:.....Sex:.....Age:.....Occupation:.....

Date of operation:.....Type of operation:.....

Follow-up (date): 3rd month 6th month Yearly: 1st 2nd 3rd 4th 5th

H A N D			
Fully open hand	Hyperextension of MCP Jts. absent	Yes	No
Fully closed hand possible		Yes	No
Lumbrical position possible		Yes	No
Grasp	Good grasp of opposite forearm possible	Yes	No
Thumb	a. Abduction & Opposition possible	Yes	No
	b. Pulp to pulp pinch possible	Yes	No
F O O T			
Drop foot correction	Heel to toe walking gait	Yes	No
Claw toes correction	Straight toes	Yes	No
E Y E			
Lagophthalmos correction	Able to fully close eye/s	Yes	No

MCP Jts.: Metacarpophangeal Joints

Post operative follow-up:

1st: 3 months after discharge, 2nd: 6 months after discharge, 3rd: 12 months after discharge then onwards: Yearly once for 5 years

Signature of MO.....Signature of PT.....

Form T8

Form T VIII

Monthly report on major RC Surgery carried out at the centre

Name of the hospital _____ District _____ State _____

Sr. No.	Name of the patient	Age / Sex	Postal Address (PHC/ Dist. Hospital)	Type of disability	Date and period of hospitalization			Surgery conducted	Remarks
					1st	2nd	3rd		

Form T9

Monthly Report - List of Grade II cases Registered directly at Tertiary Level Care Centres

Name of the hospital: _____ District: _____ State: _____

Sr. No.	Name of Patient	Age/Sex	Address	Date of Registration	Type of Deformity
1	2	3	4	5	6

List of Acronyms

ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
ASLO	Assistant State Leprosy Officer
AWW	Angan Wadi Worker
BCP	Blister Calendar Pack
BEE	Block Extension Educator
CHC	Community Health Centre
CLTRI	Central Leprosy Training & Research Institute
CMO	Cheif Medical Officer
DLO	District Leprosy Officer
DDRO	District Disability Rehabilitation Officer
DPMR	Disability Prevention & Medical Rehabilitation
DRPD	Disability Rehabilitation Programme for Disabled
DRPA	Disability Rights Protection Act
DLP	Disabled Leprosy Person
DLS	District Leprosy Society
EHF Score	Eye Hand Feet disability Scoring
GOI	Government of India
GHCS	General Health Care System
ILEP	International Federation of Anti-leprosy Associations
PWD	Person with Disability
LT	Laboratory Technician
LTC	Leprosy Training Centre
MB/PB	Multi Bacillary / Pauci-Bacillary
MDT	Multi Drug Therapy
MO	Medical Officer
MOHFW	Ministry of Health & Family Welfare
MPHW	Multipurpose Health Worker
NCLCA	Novartis Comprehensive Leprosy Care Association
NGO	Non-Governmental Organisation
NLEP	National Leprosy Eradication Programme
NRHM	National Rural Health Mission
PHC	Primary Health Centre
PMW	Para Medical Worker
PMR	Physical Medicine & Rehabilitation
POD	Prevention of Disability
POWD	Prevention of Worsening of Disability
PR	Prevalence Rate
PRI	Panchayati Raj Institutions
PT	Physio Therapist / Physio Technician
RCS	Re Constructive Surgery
RLTRI	Regional Leprosy Training & Research Institute
RSU	Reconstructive Surgery Unit

Glossary

Accompanied MDT

Provision of more than 1 BCP of MDT at a time.

Anaesthesia

Loss of sensation.

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 degrees or worse.

Case of Leprosy

A case of leprosy is a person with clinical signs of leprosy, who requires chemotherapy(MDT).

CBR

A strategy within general community, for the rehabilitation, equalisation of opportunities and social inclusion of all people disabilities.

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.

Corticosteroids

A group of drugs known for their ability to suppress inflammatory response.

Crack

Discontinuity of the epidermis, usually seen in joint folds or on the sole where the skin is thick.

Defaulter

An individual who fails to complete treatment within the prescribed time frame

Deformity

Abnormal appearance, disfigurement

Disability

Broad term covering any impairment, activity limitation or participation restriction affecting a person.

Foot-Drop

Inability to move the foot up i.e., dorsiflexion, caused by the paralysis of the muscles which lift the foot.

Indicator

Measureable aspect of a programme, which can indicate the level of performance and/or changes in performance.

Impairment

Any loss or abnormality of 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.

Lagophthalmos

Inability to close the eye

Leprosy cured person

Any person who has completed a prescribed course of MDT (6 months for PB/12 months for MB Regimen).

MDT

Multi-Drug Therapy.

Multi-bacillary cases

A leprosy patient with 6 or more skin patches.

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.

New case

A case of leprosy who has never been previously registered/treated with anti-leprosy chemotherapy.

Orthoses

A treatment device especially for hands and feet, such as splints and MCR footwear.

Prosthesis

Artificial limb.

Pauci-bacillary cases

Case having 1-5 skin patches, with definite loss of sensation/involvement of one nerve trunk.

Passive movement

Movement produced by assistance/an external force.

Person with low Vision

Having vision less than 6/18 with glasses.

Lepra Reaction

The sudden appearance of symptoms and signs of inflammation in the skin or nerves or eyes of a person with 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-actualisation.

Relapse

The re-occurrence of the disease at any time after the completion of a full course of treatment.

RFT

Release from treatment; this occurs when treatment with MDT has been successfully completed.

Self-Help Group

“A small, economically homogeneous and affinity group of rural/urban persons, 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 uplift of their families and community.”

Social integration

The active participation of persons with disabilities in the mainstream of community life.

Ulcer

Discontinuity of the skin or mucous membrane.

Wrist Drop

Inability to move the wrist into extension.

WHO Disability Grade 1

Loss of sensation in palm / soles due to damage of main peripheral nerve trunk supplying that area.

WHO Disability Grade 2

Visible disability / deformity or damage of hand & foot; or person cannot count fingers at a distance of 6 feet, lagophthalmos, iridocyclitis, and corneal opacity.

Acknowledgements

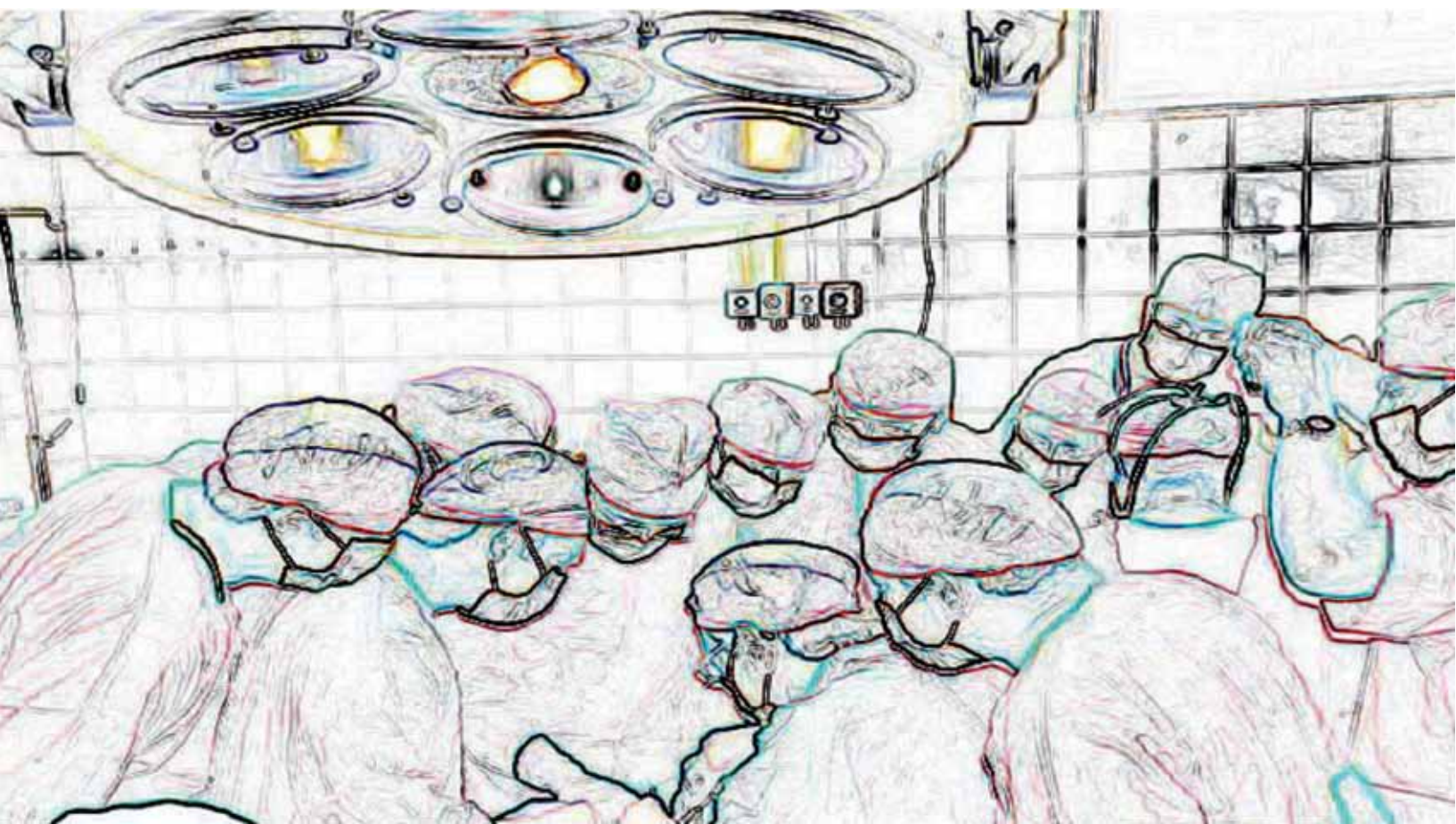
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