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Leprosy Colorful Notes

Compiled from the formatted answers with bold main words, clear headings, tables, and section-wise layout.

Topics include diagnosis, classification, MDT, NLEP, lepra reactions, deformities, epidemiology, and fiduciary duty.

Contents

QUESTION

(Feb 2023 | 2019 Scheme Old; Feb 2015 | 2010 Scheme; Feb 2023 | 2010 Scheme)

A school child / patient presents with hypopigmented or hypoanesthetic skin patches suggestive of leprosy. What are the probable causes? How will you diagnose and manage the case? What advice will you give to the family?

ANSWER

PROBABLE CAUSES

The presentation of **hypopigmented or hypoanesthetic skin patches** is primarily suggestive of:

- **Leprosy (Hansen's Disease):** A **chronic infectious disease** caused by the bacillus ***Mycobacterium leprae***, which has an affinity for **Schwann cells** and the **reticuloendothelial system**, mainly affecting the **skin** and **peripheral nerves**.
- **Differential Diagnosis:** According to the provided sources, diseases such as **Post-Kala-Azar Dermal Leishmaniasis (PKDL)** and **Diffuse Cutaneous Leishmaniasis** can present with multiple **hypopigmented macules, papules, or nodules**, and may be mistaken for **leprosy**.

DIAGNOSIS

The diagnosis of **leprosy** is established by eliciting the **Cardinal Signs** of the disease through a systematic **clinical** and **bacteriological examination**. At least one of the following **cardinal signs** must be present:

1. Clinical Examination

- **Hypopigmented or reddish skin lesion(s)** with a definite **sensory deficit**.
- **Peripheral Nerve Involvement:** Demonstrated by definite **thickening of the nerve** with a **loss of sensation**, with or without **weakness/paralysis** of the corresponding muscles of the **hands, feet, or eyes**.

Testing Sensation:

- A **light ballpoint pen** with a **plastic body** without a cap is used.
- The skin is touched lightly with the tip of the pen without stroking.
- The patient is asked to close their eyes and point to the spot touched with their index finger.
- **Loss of sensation**, especially **light touch**, in the patch confirms the **sensory deficit**.

Nerve Examination:

- **Palpation of peripheral nerves**, for example, **Ulnar, Median, Radial, Lateral popliteal**, for **thickening, tenderness, and consistency**.
- Assessment of **nerve function**, both **sensory and motor**.

2. Bacteriological Examination

- **Demonstration of *M. leprae*:** Through a **Slit Skin Smear** using the **"slit and scrape" method**. Material is obtained from an **active lesion** and from the **ear lobe**.
- **Staining:** Smears are stained using the **Ziehl-Neelsen method**.
- **Indices Assessed:**
  - **Bacteriological Index (BI):** Indicates the density of **leprosy bacilli**, both **living and dead**, on a logarithmic scale from **0 to 6+**.
  - **Morphological Index (MI):** The percentage of **solid-staining viable bacilli**.

3. Classification (For Control Programme)

Based on the **clinical** and **bacteriological findings**, the case is classified into:

- **Paucibacillary (PB) Leprosy: 1 to 5 skin lesions**, no nerve or only **one nerve involved**, and skin smear is **negative at all sites**.
- **Multibacillary (MB) Leprosy: 6 or more skin lesions**, more than **one nerve involved**, or skin smear is **positive at any site**.

MANAGEMENT

Management relies on **Multi-Drug Therapy (MDT)**, which is **safe and effective**. The regimen and duration depend on the **classification** and the **age of the patient**.

1. Multi-Drug Therapy (MDT)

For a **school child**, for example, children aged **10-14 years**, the recommended standard regimen is:

Paucibacillary (PB) Leprosy

6-month duration within 9 months

- **Rifampicin: 450 mg once a month**, given under **supervision**.
- **Dapsone: 50 mg daily**, self-administered.

Multibacillary (MB) Leprosy

12-month duration within 18 months

- **Rifampicin: 450 mg once a month**, given under **supervision**.
- **Clofazimine: 150 mg once a month supervised**; and **50 mg every other day**, self-administered.

- **Dapsone: 50 mg daily**, self-administered.

> **Note:** For adults, the dosages are higher: **Rifampicin 600 mg**, **Dapsone 100 mg**, and **Clofazimine 300 mg monthly/50 mg daily**.

2. Management of Lepra Reactions

- If the child develops a **lepra reaction**, **Reversal reaction** or **Erythema Nodosum Leprosum**, **MDT must be continued**.
- Moderate to severe reactions are managed with **Prednisolone**, starting dose should not exceed **1 mg/kg body weight per day** for children, tapered gradually.
- **Analgesics** and **rest to the affected nerves using splints** are provided.

3. Disability Prevention and Medical Rehabilitation (DPMR)

- **Self-care practices: Soaking, scrubbing, oiling, and dressing** of affected limbs.
- Provision of **Micro-cellular rubber (MCR) footwear** to protect **insensitive feet**.
- **Physiotherapy** and **reconstructive surgery** for established deformities.

ADVICE TO THE FAMILY

Health Education and Counseling are critical to ensure **compliance** and reduce **stigma**. The family should be advised on the following:

1. Disease Education & De-stigmatization:

- Reassure the family that leprosy is a **bacterial infection**, **curable**, and **not a hereditary disease**.
- Educate them that regular and adequate treatment renders the patient **non-infectious rapidly**.
- Encourage the family to accept the patient without **discrimination** to remove the **social stigma** attached to the disease.

2. Treatment Compliance:

- Emphasize the strict necessity of taking the **MDT regularly and completely** without defaulting.
- Educate them on the possible **side effects of drugs**, for example, **dark red discoloration of the skin and urine due to Clofazimine**, and assure them these are **harmless and reversible**.

3. Contact Tracing and Surveillance:

- All **household and close contacts** must undergo a **contact survey**, clinical examination, to detect any **hidden or early cases**.
- Contacts should be evaluated for **Post-Exposure Prophylaxis (PEP)** if implemented in the **national programme guidelines**.

4. Prevention of Disabilities & Self-Care:

- Teach the family to assist the child in daily inspection of **hands, feet, and eyes** for any **cuts or injuries**.
- Advise the use of **protective footwear (MCR)** and avoid handling **sharp or hot objects directly** if there is sensory loss.
- Advise them to report immediately to the **health center/PHC** if they notice signs of a **Lepra reaction**, sudden **redness/swelling of lesions**, appearance of **new painful nodules**, or **nerve pain**.

QUESTION

(Aug 2024 | 2010 Scheme; Feb 2023 | 2010 Scheme; Feb 2015 | 2010 Scheme)

Classify leprosy clinically for planning treatment. Differentiate between paucibacillary and multibacillary leprosy. Add a note on lepromatous and tuberculoid leprosy.

ANSWER

CLINICAL CLASSIFICATION FOR CONTROL PROGRAMME

After making a diagnosis of **leprosy**, the patient must be grouped based on certain **clinical** and **bacteriological characteristics**. This classification is vital for selecting the correct **Multi-Drug Therapy (MDT)** regimen for the patient.

For the purpose of planning treatment under the **national control programme**, leprosy is classified into two main groups:

1. **Paucibacillary (PB) Leprosy**
2. **Multibacillary (MB) Leprosy**

Note: If the **skin smear is positive** irrespective of the number of skin and nerve lesions, the disease is automatically classified as **MB leprosy**.

DIFFERENTIATION BETWEEN PAUCIBACILLARY (PB) AND MULTIBACILLARY (MB) LEPROSY

The differentiation is based on the number of **skin lesions**, the extent of **peripheral nerve involvement**, and the results of the **skin smear examination**.

Feature	Paucibacillary (PB)	Multibacillary (MB)
Skin Lesions	**1 to 5 lesions**	**6 and more lesions**
Nerve Involvement	**No nerve** or only **one nerve trunk involved**	**More than one nerve trunk involved** irrespective of the number of skin lesions
Skin Smear (Bacteriological Examination)	**Negative at all sites**	**Positive at any site**

NOTE ON LEPROMATOUS AND TUBERCULOID LEPROSY

Leprosy manifests itself in two polar forms, namely **lepromatous leprosy** and **tuberculoid leprosy**, which lie at the two ends of a long **clinical** and **immunological spectrum** of the disease. The development into either polar type depends entirely upon the host's **immunological response**, specifically **Cell-Mediated Immunity**, to the ***Mycobacterium leprae*** infection.

1. Tuberculoid Leprosy

- **Immunology:** Occurs in individuals who mount a specific and effective **Cell-Mediated Immunity (CMI)** against ***M. leprae***.
- **Disease Progression:** The effective **CMI** controls the infection, limiting the multiplication of bacilli. This corresponds to the **Paucibacillary (PB)** type of leprosy.
- **Lepromin Test:** The test is usually **strongly positive** in typical tuberculoid cases, reflecting intact **cell-mediated immunity**.
- **Clinical Course:** A large proportion of early lesions may heal spontaneously. The disease remains relatively **localized**, for example, affecting nerves close to the skin or presenting as **purely neural leprosy**.

2. Lepromatous Leprosy

- **Immunology:** Characterized by a **complete breakdown or deficiency of Cell-Mediated Immunity (CMI)**. Although the **humoral response**, antibodies/ immunoglobulins of **IgG and IgM classes**, is more pronounced at the lepromatous end, these antibodies do not protect against the **intracellular bacilli**.
- **Disease Progression:** Because **CMI is deficient**, the disease spreads uncontrolled and produces **Multibacillary (MB) leprosy** with multiple system involvement, affecting **skin, muscles, eyes, bones, testes, and internal organs**.
- **Bacterial Load:** The **bacterial load** is highest in lepromatous cases. As many as **2 to 7 billion bacilli** can be estimated in one gram of **leproma tissue**.
- **Infectivity: Highly infectious**. Lepromatous cases harbour millions of ***M. leprae*** in their **nasal mucosa**, which are discharged when they sneeze or blow their nose. **Nose-blow smears** may show a high percentage of **solid-staining bacilli**.
- **Lepromin Test:** The test is typically **negative**, indicating the failure of **CMI** and **anergy** to the leprosy bacilli antigens.
- **Epidemiology: Sex differences** in leprosy incidence are more marked among **lepromatous cases** than **non-lepromatous cases**, higher in males.

QUESTION

(Jan 2026 | 2019 Scheme New; Jun 2024 | 2019 Scheme Old; Mar 2025 | 2010 Scheme; Feb 2023 | 2010 Scheme; Feb 2017 | 2010 Scheme; Sept 2015 | 2010 Scheme; Mar 2014 | 2010 Scheme)

Describe the multidrug therapy / chemotherapy regimens and duration of treatment for adult and child leprosy patients. Differentiate between treatment of paucibacillary and multibacillary leprosy.

ANSWER

MULTIDRUG THERAPY (MDT) FOR LEPROSY

The proper application of **Multidrug Therapy (MDT)** is crucial to the success of **leprosy control**. **MDT** utilizes a combination of **bactericidal** and **bacteriostatic drugs** to cure the patient, interrupt transmission, and prevent the emergence of **drug resistance**. The treatment is dispensed in specific **blister packs** depending on the classification of the disease and the age of the patient.

DIFFERENTIATION BETWEEN PAUCIBACILLARY (PB) AND MULTIBACILLARY (MB) LEPROSY TREATMENT

The treatment strategy fundamentally differs between **PB** and **MB leprosy** based on the number of drugs used and the total duration of the therapy:

- **Number of Drugs:**
  - **Paucibacillary (PB) Leprosy:** Treated with a **two-drug regimen** consisting of **Rifampicin** and **Dapsone**.
  - **Multibacillary (MB) Leprosy:** Treated with a **three-drug regimen** consisting of **Rifampicin**, **Dapsone**, and **Clofazimine**.
- **Duration of Treatment:**
  - **Paucibacillary (PB) Leprosy:** The duration is **6 months**, **6 monthly doses**, which must be completed within a maximum period of **9 months**.
  - **Multibacillary (MB) Leprosy:** The duration is **12 months**, **12 monthly doses**, which must be completed within a maximum period of **18 months**.

CHEMOTHERAPY REGIMENS FOR ADULT LEPROSY PATIENTS

1. Adult Multibacillary (MB) Leprosy Regimen

The recommended standard regimen for **adult MB leprosy** includes:

- **Rifampicin: 600 mg once a month**, given under **supervision**.

- **Clofazimine: 300 mg once a month supervised**; AND **50 mg daily**, **self-administered**.
- **Dapsone: 100 mg daily**, **self-administered**.
- **Duration: 12 months**, to be completed within **18 months**.

2. Adult Paucibacillary (PB) Leprosy Regimen

The recommended standard regimen for **adult PB leprosy** includes:

- **Rifampicin: 600 mg once a month**, given under **supervision**.
- **Dapsone: 100 mg daily**, **self-administered**.
- **Duration: 6 months**, to be completed within **9 months**.

CHEMOTHERAPY REGIMENS FOR CHILD LEPROSY PATIENTS (10-14 YEARS)

For children between **10 to 14 years** of age, the standard treatment regimens use appropriately reduced dosages.

> **Note:** Children under the age of **10 years** should receive further appropriately reduced doses of these drugs.

1. Child Multibacillary (MB) Leprosy Regimen

- **Rifampicin: 450 mg once a month**, given under **supervision**.
- **Clofazimine: 150 mg once a month supervised**; AND **50 mg every other day**, **self-administered**.
- **Dapsone: 50 mg daily**, **self-administered**.
- **Duration: 12 months**, to be completed within **18 months**.

2. Child Paucibacillary (PB) Leprosy Regimen

- **Rifampicin: 450 mg once a month**, given under **supervision**.
- **Dapsone: 50 mg daily**, **self-administered**.
- **Duration: 6 months**, to be completed within **9 months**.

> **Note:** Where **Clofazimine** is totally unacceptable owing to the **dark red colouration of skin** it causes, its replacement by **250 to 375 mg self-administered daily doses** of **ethionamide** or **protionamide** has been suggested.

QUESTION

(Jun 2024 | 2019 Scheme Old; Feb 2023 | 2019 Scheme Old; Feb 2015 | 2010 Scheme)

In a school, three children are found to have white patches with loss of sensation. What is the probable diagnosis? Calculate the attack rate. Describe case finding methods and management of detected cases.

ANSWER

PROBABLE DIAGNOSIS

The probable diagnosis is **Leprosy** (**Hansen's disease**).

According to the provided sources, **Leprosy** is clinically diagnosed by eliciting the **Cardinal Signs** of the disease. The presence of **hypopigmented (white) patches** with a **partial or total loss of cutaneous sensation** (**definite sensory deficit**) in the affected areas is a primary cardinal feature of the disease.

CALCULATION OF ATTACK RATE

Formula:

Attack rate = (Number of new cases of a specified disease during a specified time interval / Total population at risk during the same interval) × 100

Calculation:

- **Numerator** (**Number of new cases**): **3**
- **Denominator** (**Total population at risk**): **Total number of children in the school**

Interpretation:

The exact **Attack Rate** cannot be calculated because the **total population of the school** (**denominator**) is not explicitly mentioned in the provided source question. If the **total school strength** was provided, the formula would yield the **attack rate** as a percentage.

CASE FINDING METHODS

Early case detection is essential to interrupt **transmission** and prevent the development of associated **deformities**. The choice of **case-finding methods** is related to the **prevalence rate of leprosy** in the region:

1. Contact Survey

- **Technique of choice** in areas where the prevalence is generally low, less than **1 case per 1000 population**.

- Involves the examination of all **contacts**, especially **household contacts**, **children**, and persons reported to be suspected cases.

2. Group Surveys

- Employed when the prevalence is about **1 per 1000** or higher.
- Involves the **screening** of **pre-school** and **school children**, people living in **slums**, **military recruits**, and **industrial labour** for all types of skin diseases.
- This technique, often organized as **"skin camps"**, brings out additional cases.
- **Note:** The value of **school surveys** as a case-finding method diminishes if **school enrolment** is less than **70%** in the **6-14 years** age group.

3. Mass Surveys

- Recommended only in **hyperendemic areas**, prevalence of **10 or more per 1000 population**.
- Involves **total population surveys** by **house-to-house visits** with a required coverage of not less than **95%**.

MANAGEMENT OF DETECTED CASES

Management relies on proper **Classification**, prompt initiation of **Multi-Drug Therapy (MDT)**, and prevention of **disabilities**.

1. Classification

For treatment purposes, the school children must be classified based on **clinical examination**:

- **Paucibacillary (PB) Leprosy: 1 to 5 skin lesions** and **no nerve** or only **one nerve involvement**.
- **Multibacillary (MB) Leprosy: 6 or more skin lesions**, or more than **one nerve trunk involved**.

2. Multi-Drug Therapy (MDT) for Children

The standard **MDT** regimen for children, for example, **10-14 years of age**, is dispensed in specific **blister packs**:

Paucibacillary (PB) Leprosy Regimen

Duration: 6 months, to be completed within 9 months

- **Rifampicin: 450 mg once a month**, given under **supervision**.
- **Dapsone: 50 mg daily**, **self-administered**.

Multibacillary (MB) Leprosy Regimen

Duration: 12 months, to be completed within 18 months

- **Rifampicin: 450 mg once a month**, given under **supervision**.

- **Clofazimine: 150 mg once a month supervised**; and **50 mg every other day**, **self-administered**.
- **Dapsone: 50 mg daily**, **self-administered**.

> **Note:** Children under the age of **10 years** should receive appropriately reduced doses of these drugs.

3. Surveillance and Follow-up

- **PB cases:** Examined clinically at least once a year for a minimum of **2 years** after completion of treatment.
- **MB cases:** Examined clinically at least once a year for a minimum period of **5 years** after completion of therapy.
- The children should be monitored for the development of any **Lepra reactions**, sudden **redness/swelling of patches** or **new painful nodules**, which require immediate management with **Prednisolone** without stopping **MDT**.

4. Disability Prevention and Medical Rehabilitation (DPMR)

- **Self-care practices:** Instructing the children and their families on daily inspection of **hands and feet**.
- Provision of **Micro-cellular rubber (MCR) footwear** to protect **insensitive feet** from injuries.

QUESTION

(Jun 2024 | 2019 Scheme Old; Dec 2021 | 2010 Scheme)

List the objectives of multidrug therapy in leprosy. Add a note on the National Leprosy Eradication Programme.

ANSWER

OBJECTIVES OF MULTIDRUG THERAPY (MDT) IN LEPROSY

The proper application of **Multidrug Therapy (MDT)** is crucial to the success of **leprosy control**. The main **objectives** of multidrug chemotherapy in leprosy are:

1. **To interrupt transmission:** To interrupt transmission of the infection in the community by sterilizing **infectious patients** as rapidly as possible with **bactericidal drugs**.
2. **To prevent deformity:** To ensure **early detection and treatment** of cases to prevent the development of associated **deformities**.
3. **To prevent drug resistance:** To prevent the emergence of **drug-resistant strains** of ***Mycobacterium leprae***, which was a major drawback of earlier **Dapsone monotherapy**.

NATIONAL LEPROSY ERADICATION PROGRAMME (NLEP)

Introduction and History

- The **National Leprosy Control Programme (NLCP)** was launched in India in **1955**.
- With the introduction of **Multi-Drug Therapy (MDT)**, the programme was renamed as the **National Leprosy Eradication Programme (NLEP)** in **1983** and implemented as a **Centrally Sponsored Scheme**.

Goals and Achievements

- **Goal:** To achieve **elimination of leprosy** as a public health problem, defined as reducing the case load to **1 or less than 1 case per 10,000 population**.
- **Achievement:** India achieved the goal of **leprosy elimination** at the national level in **December 2005**.

Major Components and Strategies

- **Integration:** Decentralized and integrated **leprosy services** through the general health care system, **Primary Health Centres** and **Sub-centres**.
- **Case Detection:** Focus shifted from **disease prevalence** to **new case detection**. The **new case detection rate** is now the main indicator for programme monitoring.
- **Treatment Completion:** The **treatment completion rate** is taken as a critical **performance indicator**.
- **Capacity Building:** Training and capacity building of all **general health services functionaries**.

Major Initiatives and Activities

1. Involvement of ASHA Workers

ASHA workers are actively involved in bringing out suspected leprosy cases from their villages for diagnosis at the **PHC** and following up on confirmed cases for **treatment completion**. They are provided specific **incentive money**:

- **Rs. 250/-** on confirmed diagnosis of a case brought by them.
- **Rs. 400/-** on completion of treatment for **Paucibacillary (PB) leprosy**.
- **Rs. 600/-** on completion of treatment for **Multibacillary (MB) leprosy**.
- **Rs. 250/-** for early detection before the onset of any visible deformity.
- **Rs. 200/-** for a new case with visible deformity in **hands, feet, or eyes**.

2. Disability Prevention and Medical Rehabilitation (DPMR)

- Provision of **dressing materials**, **supportive medicines**, and **ulcer kits** to leprosy-affected persons.
- Provision of **Micro-cellular rubber (MCR) footwear** for the protection of **insensitive feet**.
- **Reconstructive Surgeries (RCS)** are conducted at identified **District Hospitals/ Medical Colleges/NGOs** for the correction of disabilities.
- A welfare allowance/incentive of **Rs. 12,000/-** is provided to each leprosy-affected person, from **BPL families**, undergoing **reconstructive surgery** to compensate for the loss of wages.

3. Information, Education, and Communication (IEC)

- **Awareness Campaigns:** Intensive **IEC campaigns** with themes like "*Towards Leprosy Free India*" to reduce **stigma** and **discrimination**.
- **Sparsh Leprosy Awareness Campaign (SLAC):** Launched in **2017** through **Gram Sabhas** and **Village Health Sanitation and Nutrition Committees** to generate awareness, reduce stigma, and improve self-reporting of cases.

4. Three-Pronged Strategy (Introduced 2016-17)

- **Leprosy Case Detection Campaign (LCDC): House-to-house active search** for cases.
- **Focused Leprosy Campaign (FLC):** For **high-endemic areas**.
- **Special plan for hard-to-reach areas:** To find cases in **difficult terrains** and **geographically difficult locations**.

National Strategic Plan and Roadmap for Leprosy (2023-2027)

The implementation of this strategic plan aims to achieve **interruption of transmission** at the district level, evidenced by **zero occurrence of new child cases for at least five consecutive years**. The strategic pillars are:

- **Pillar 1:** Strengthen **leadership, commitment, and partnerships**.
- **Pillar 2:** Accelerate **case detection**, including **contact tracing** and **Post Exposure Prophylaxis (PEP)**.
- **Pillar 3:** Provide **Quality Services**, including **nutritional support** and **pharmacovigilance**.
- **Pillar 4:** Prevention of **Disease, Disabilities, Stigma, Discrimination, and Violation of Human Rights**.
- **Pillar 5:** Develop **Digital Surveillance Systems**, launch and rollout of **Nikusth 2.0** digital reporting.

QUESTION

(Feb 2023 | 2010 Scheme; Aug 2018 | 2010 Scheme)

Describe the two types of lepra reactions. Differentiate between Type 1 and Type 2 lepra reactions and mention the signs of each.

ANSWER

DEFINITION OF LEPRA REACTIONS

During the course of **leprosy**, immunologically mediated episodes of **acute or subacute inflammation** may occur, which are known as **Lepra Reactions**. Because **peripheral nerve trunks** are often involved, unless reactions are promptly and adequately treated, such episodes can result in **permanent deformities**.

They can occur **before the start of multi-drug treatment**, **during treatment**, or **after treatment has been completed**.

TYPES OF LEPRA REACTIONS

There are two primary types of reactions:

1. **Type 1 Reaction:** Also known as **Reversal Reaction**.
2. **Type 2 Reaction:** Also known as **Erythema Nodosum Leprosum (ENL)**.

DIFFERENTIATION BETWEEN TYPE 1 AND TYPE 2 LEPRA REACTIONS

Based on **clinical** and **immunological manifestations**, the two reactions can be differentiated as follows:

1. Immunological Mechanism

- **Type 1 (Reversal Reaction):** Mediated by **Delayed hypersensitivity** (**Cell-Mediated Immunity**).
- **Type 2 (ENL):** Mediated by **Antigen antibody reaction** (**Humoral Immunity/ Immune Complex**).

2. Occurrence by Leprosy Spectrum

- **Type 1 (Reversal Reaction):** Occurs in both **Paucibacillary (PB)** and **Multibacillary (MB)** cases in unstable types like **BT, BB, and BL**.
- **Type 2 (ENL):** Seen in **Multibacillary (MB)** cases only (**BL and LL type**).

3. Skin Lesions

- **Type 1 (Reversal Reaction):** The pre-existing original leprosy **skin lesions suddenly become reddish, swollen, warm, painful, and tender**. New lesions may appear. **Ulceration** does not usually occur unless severe.
- **Type 2 (ENL): Red, painful, tender, sub-cutaneous nodules (ENL)** appear, commonly on the **face, arms, and legs**, bilaterally symmetrical. They appear in crops and subside within a few days even without treatment (**evanescent skin nodules**). The original leprosy skin patches remain as they were. Nodules are better felt than seen and are **episodic/recurrent**.

4. Nerve Involvement (Neuritis)

- **Type 1 (Reversal Reaction):** Nerves close to the skin may be **enlarged, tender, and painful** with sudden loss of its functions, **loss of sensory, motor, or autonomic function**.
- **Type 2 (ENL):** Nerves may be affected, but it is not as **common, severe, or acute** as in **Type I**.

5. Systemic and Organ Involvement

- **Type 1 (Reversal Reaction):** Other organs are **not affected**. General symptoms, like **fever**, are not common. Eye involvement manifests as **lagophthalmos** and **corneal anaesthesia** strictly due to **neuritis**.
- **Type 2 (ENL):** Causes a general feeling of **systemic upset**. **Fever, joint pain, and red eyes with watering** may be associated. Other organs like the **eyes** (**Iritis/iridocyclitis**), **testis**, and **kidney** may be affected.

SIGNS OF SEVERE LEPRA REACTIONS

Because of the high risk of **permanent damage** to the **peripheral nerve trunks**, it is crucial to recognize the signs of a **severe reaction** which require treatment with corticosteroids, for example, **Prednisolone**.

Signs of a Severe Reversal Reaction (Type 1):

- **Loss of nerve function:** Loss of **sensation** or **muscle weakness** in the area supplied by the nerve.
- **Pain or tenderness** in one or more nerves.
- **Silent neuritis/quiet nerve paralysis:** Signs of **nerve damage** without symptoms.
- A **red, swollen skin patch** on the **face**, or overlying another major **nerve trunk**.
- A skin lesion anywhere that becomes **ulcerated**.
- Marked **oedema** of the **hands, feet, or face**.

Signs of a Severe ENL Reaction (Type 2):

- **Pain or tenderness** in one or more nerves, with or without loss of **nerve function**.

- **Ulceration** of the **ENL nodules**.
- **Pain of eyes** with or without **redness** and loss of **visual acuity**.
- Painful swelling of the testes (**orchitis**) or of the fingers (**dactylitis**).
- Marked **arthritis** or **lymphadenitis**.

QUESTION

(Feb 2024 | 2010 Scheme; Sept 2014 | 2010 Scheme)

List the deformities seen in leprosy. Describe community-based rehabilitation and disability prevention in leprosy.

ANSWER

DEFORMITIES SEEN IN LEPROSY

As a single disease entity, **leprosy** is one of the foremost causes of **deformities** and **crippling**. According to the provided sources, the deformities occurring in patients with leprosy are classified anatomically as follows:

- **Face: Mask face**, **facies leonina**, **sagging face**, **lagophthalmos**, loss of eyebrows (**superciliary madarosis**) and eyelashes (**ciliary madarosis**), **corneal ulcers** and **opacities**, **perforated nose**, **depressed nose**, and **ear deformities** (e.g., nodules on the ear and elongated lobules).
- **Hands: Claw hand**, **wrist-drop**, **ulcers**, **absorption of digits**, **thumb-web contracture**, **hollowing of the interosseous spaces**, and **swollen hand**,.
- **Feet: Plantar ulcers**, **foot-drop**, **inversion of the foot**, **clawing of the toes**, **absorption of the toes**, **collapsed foot**, **swollen foot**, and **callosities**.
- **Other Deformities: Gynaecomastia** and **perforation of the palate**.

DISABILITY PREVENTION IN LEPROSY

The cheapest and surest rehabilitation is to prevent **physical deformities** by **early diagnosis** and **adequate treatment** (**Multi-Drug Therapy**). Disability prevention focuses on protecting **denervated areas** and managing established **nerve damage**.

Key Measures for Disability Prevention:

- **Self-Care Practices:** Taking care of the **dry, denervated skin** of palms and soles, and healing **wounds, ulcers, and skin cracks**.
- **Protective Gear:** Preventing injuries to **hands and feet** by using **protective gloves** and **Micro-cellular rubber (MCR) footwear**,.
- **Physiotherapy:** Preventing **joint stiffness** in cases of paralytic deformities and promoting **muscle re-education**.
- **Eye Protection:** Protecting the **eyes** and preventing **corneal exposure** in cases of **lagophthalmos**.
- **Nerve Assessment:** Periodically assessing the commonly damaged nerves for **loss of nerve function** and its progression using simple field tests.

- **Management of Lepra Reactions:** Prompt treatment of acute **lepra reactions** with corticosteroids like **Prednisolone** to prevent permanent **nerve damage**,.

Disability Prevention and Medical Rehabilitation (DPMR) under NLEP:

- The **National Leprosy Eradication Programme (NLEP)** incorporates **DPMR** services in a **three-tier system** (**primary, secondary, and tertiary levels**),.
- Activities include the provision of **dressing materials**, **supportive medicines**, and **ulcer kits** to leprosy-affected persons.
- **ASHA Workers** are incentivized, e.g., **Rs. 250**, for the **early detection** of cases before the onset of any visible deformity, thereby cutting down **transmission** and **disability potential**.

COMMUNITY-BASED REHABILITATION (CBR) IN LEPROSY

Rehabilitation is the physical and mental restoration, as far as possible, of all treated patients to normal activity, enabling them to resume their place in the **home**, **society**, and **industry**.

Definition and Strategy:

- **Community-based rehabilitation (CBR)** is defined as a strategy within general community development for the **rehabilitation**, **equalization of opportunities**, and **social inclusion** of all people with disabilities.
- It is implemented through the combined efforts of the **people with disabilities themselves**, their **families**, **organizations**, **communities**, and relevant **governmental and non-governmental services**.

Components of Community-Based Rehabilitation:

- **Medical Rehabilitation:** Use of **corrective splints** and **orthopaedic devices**. **Reconstructive Surgery (RCS)** is conducted at identified institutions, and the government provides an incentive of **Rs. 12,000/-** to patients from **BPL families** undergoing **RCS** to compensate for the loss of wages,,.
- **Vocational and Educational Training:** Consistently training or retraining the individual over years to achieve the highest possible level of **functional ability**.
- **Social Support:** Identifying and meeting the **economic** and **social problems** of the patient and family. This includes **travel assistance to clinics**, **food grains**, **clothing**, **child education**, and **job placement**, often supported by **voluntary agencies (NGOs)** and **Departments of Social Welfare**,,.
- **Health Education and De-stigmatization:** Intensive **Information, Education, and Communication (IEC)** campaigns, e.g., "*Towards Leprosy Free India*" and the "*Sparsh Leprosy Awareness Campaign*", are conducted to reduce **stigma** and **discrimination**.

The public is educated that leprosy is **curable**, **not hereditary**, and that regular treatment renders the patient **non-infectious**, promoting **community acceptance** and **inclusion**,,.

QUESTION

(Aug 2023 | 2019 Scheme Old)

Describe the modes of transmission of leprosy. Add a note on important epidemiological features of leprosy.

ANSWER

MODES OF TRANSMISSION OF LEPROSY

The exact mode of **transmission of leprosy** has not been established with absolute certainty. However, the following theories are frequently debated and accepted:

1. Droplet Infection (Airborne Route)

- There is increasing evidence that leprosy is transmitted via **aerosols** containing ***Mycobacterium leprae*** (**droplet infection**).
- With the realization of the **nose** as a major **portal of exit**, the **respiratory tract** is considered the most probable **portal of entry**.
- **Lepromatous cases** harbour millions of bacilli in their **nasal mucosa**, which are discharged when they **sneeze** or **blow their nose**.
- A large number of **morphologically intact bacilli** are demonstrated in **nasal discharges**.
- ***M. leprae*** can survive outside the human host for several hours or days in **dried nasal secretions**, at least **9 days**.

2. Contact Transmission

- **Direct Contact:** Leprosy is believed to be transmitted from **person to person** by close contact between an **infectious patient** and a **healthy, susceptible person**. However, leprologists opine that **intimate skin-to-skin contact** is not strictly necessary to acquire infection.
- **Indirect Contact:** Infection may occur through contact with **contaminated soil** and **fomites**, e.g., contaminated **clothes** and **linen**. Leprosy bacilli can survive for long periods in the **soil** under favourable environmental conditions.

3. Other Routes

- Bacilli may possibly be transmitted by **insect vectors** or **tattooing needles**, though there is no strong evidence that these routes are important in nature.

IMPORTANT EPIDEMIOLOGICAL FEATURES OF LEPROSY

Agent Factors

- **Agent:** Caused by ***Mycobacterium leprae***, an **intracellular**, **obligate**, **acid-fast**, **gram-positive**, **non-motile**, **rod-shaped organism**.
- **Pathogenicity:** It has **low pathogenicity**. Only a small proportion of infected people develop signs of the disease.
- **Tissue Affinity:** The bacilli have a special affinity for **Schwann cells** and cells of the **reticuloendothelial system**.
- **Generation Time:** The bacilli multiply very slowly, with a doubling time of **12 to 14 days**.
- **Source of Infection: Multibacillary cases**, **lepromatous** and **borderline lepromatous**, are the most important source of infection in the community. **Subclinical cases** also serve as a source.

Host Factors

- **Age:** Infection can occur at any age. The peak incidence generally lies between **20 and 30 years** of age. A high prevalence among **children** indicates that the disease is active and spreading in the community.
- **Sex:** Both **incidence** and **prevalence** appear to be higher in **males** than in **females** in most regions, particularly among adults and in the **lepromatous type**.
- **Immunity: Cell-Mediated Immunity (CMI)** is responsible for resistance to ***M. leprae***. In **lepromatous leprosy**, there is a complete breakdown of **CMI**. **Humoral antibodies** are produced but do not offer protection.
- **Genetic Factors:** Evidence shows that **human lymphocyte antigen (HLA)** linked genes influence the type of immune response that develops.
- **Migration:** Movement of populations from **rural** to **urban areas** is creating a leprosy problem in **urban slums**.

Environmental Factors

- **Climate: Humidity** favours the survival of ***M. leprae*** in the environment. Bacilli can remain viable in **moist soil** at room temperature for **46 days**.
- **Housing: Overcrowding** and a lack of **ventilation** within households favour the transmission of the disease.

Incubation Period

- Leprosy has an extremely long **incubation period**, averaging **3 to 5 years**.
- Depending upon the host's resistance, it can take as long as **20 years** for symptoms to appear.

QUESTION

(Jan 2026 | 2019 Scheme New; May 2025 | 2019 Scheme New; Feb 2025 | 2019 Scheme New)

What is fiduciary duty? Explain how it is applicable to doctors in the management of leprosy. Mention penalties for breach of fiduciary duty with an example.

ANSWER

DEFINITION OF FIDUCIARY DUTY

Fiduciary duty refers to a doctor's obligation to act in the **best interests of their patient**, prioritizing the **patient's welfare** above personal interests. In healthcare, it is a cornerstone of the **doctor-patient relationship**, built on principles like **trust**, **honesty**, and **loyalty**.

COMPONENTS OF FIDUCIARY DUTY

According to the provided sources, the key components of **fiduciary duty** in medical practice include:

1. **Duty of care:** Doctors must provide **competent**, **attentive**, and **evidence-based medical care**, ensuring every decision serves the patient's best interest.
2. **Loyalty to the patient:** Doctors are ethically and legally bound to place the **patient's welfare** above personal, financial, or third-party interests.
3. **Informed consent and autonomy:** Physicians must ensure patients are fully informed about **treatment options**, **risks**, and **alternatives**, empowering them to make autonomous choices.
4. **Confidentiality:** Protecting patient information is critical. Doctors must safeguard the **privacy of medical information** and only share it with relevant parties.
5. **Transparency and honesty:** Demands honesty regarding **diagnoses**, **treatments**, and **potential risks**, including the disclosure of medical errors to maintain trust.
6. **Advocacy for patient rights:** Doctors should advocate for their patients' needs, ensuring they receive **equitable** and **necessary care** without undue hardship or discrimination.

APPLICABILITY TO DOCTORS IN THE MANAGEMENT OF LEPROSY

In the context of **leprosy** (**Hansen's Disease**), the application of **fiduciary duty** is highly critical due to the chronic nature of the disease and its associated **social stigma**.

- **Applying Duty of Care:** The doctor must provide **evidence-based treatment** by correctly classifying the patient (**Paucibacillary** or **Multibacillary**) and promptly initiating the standard **Multi-Drug Therapy (MDT)** regimens (**Rifampicin**, **Dapsone**, and **Clofazimine**). The doctor must also actively monitor for and manage **Lepra reactions** to prevent permanent **nerve damage** and **deformities**.
- **Applying Transparency and Honesty:** The doctor must honestly communicate the diagnosis and educate the patient and family that leprosy is a **bacterial disease**, is **curable**, and is **not hereditary**. The doctor must also transparently explain the potential side effects of **MDT**, such as the **dark red discoloration of skin and urine** caused by **Clofazimine**, assuring them it is reversible.
- **Applying Confidentiality:** Leprosy is associated with severe **social stigma** and wrong beliefs. The doctor is ethically obligated to maintain strict **confidentiality** regarding the patient's diagnosis to protect them from **social rejection**, **isolation**, and **emotional distress** in their community.
- **Applying Advocacy for Patient Rights:** The doctor must advocate against **discrimination** and ensure the patient receives comprehensive care, including **Disability Prevention and Medical Rehabilitation (DPMR)** services, such as **Micro-cellular rubber (MCR) footwear**, **ulcer kits**, and referrals for **reconstructive surgery**.

PENALTIES FOR BREACH OF FIDUCIARY DUTY

If a doctor breaches their **fiduciary duty**, e.g., through **negligence** or **unauthorized disclosure of confidential information**, the patient or their relatives can seek redressal through statutory and legal avenues:

1. Medical Council of India (MCI) / State Medical Councils

- The **Medical Council of India** has ethical jurisdiction over the medical profession.
- **Penalty:** If found guilty of **professional misconduct** or **negligence**, the council can **cancel the registration** of the concerned doctor either temporarily or permanently. The council cannot punish with imprisonment or award financial compensation.

2. Consumer Protection Act (Consumer Courts)

- Patients can file a complaint against the medical professional in a **consumer court** for **deficiency in service** or **medical negligence**.
- **Penalty:** Consumer courts can grant **monetary compensation** to the patient.

- **Monetary Limits: District Consumer Court** up to **Rs. 20 lacs**, **State Commission Rs. 20 lacs to Rs. 1 crore**, and **National Commission** above **Rs. 1 crore**.

EXAMPLE OF BREACH IN LEPROSY MANAGEMENT

- **Breach of Confidentiality:** A doctor treats a young patient for leprosy. Despite assuring the patient of privacy, the doctor accidentally discloses the **leprosy diagnosis** to the patient's neighbors or extended family.
- **Consequence:** Because leprosy carries immense **social stigma**, this unauthorized disclosure leads to the patient facing **social boycott** and severe **emotional distress**.
- **Penalty Action:** The patient's trust is violated, undermining their autonomy. The patient could report this **professional misconduct** to the **Medical Council**, which could result in the temporary cancellation of the doctor's license to practice.