

# Leprosy



## Case Definition

**Confirmed Case:** The demonstration of acid-fast bacilli in skin or dermal nerve from a person with clinically compatible illness who is being seen for the first time in Canada for symptoms of leprosy.

**Clinical Case:** Histopathologic evidence of leprosy in a skin biopsy from a person with prior diagnosis of leprosy, seen for the first time in Canada for symptoms of leprosy.

## Reporting Requirements

- All positive laboratory tests are reportable by laboratory.
- All cases are reportable by attending health care professional.

## Clinical Presentation/Natural History

Leprosy is a chronic bacterial disease of the skin, peripheral nerves and/or the upper airway. The manifestations of the disease vary in a continuous spectrum between the two forms, lepromatous and tuberculoid.

In lepromatous leprosy (the multibacillary form): skin lesions (nodules, papules, macules and diffuse infiltrations) are bilaterally symmetrical, numerous and extensive; and there can be involvement of the nasal mucosa (crusting, obstructed breathing and epistaxis) and ocular involvement (iritis and keratitis).

In tuberculoid leprosy (the paucibacillary form): skin lesions (sharply demarcated, anesthetic or hypoesthetic) are single or few and bilaterally asymmetrical, and peripheral nerve involvement tends to be severe.

An early form of the disease, indeterminate leprosy, is manifested by a hypopigmented macule with ill-defined borders, and, if untreated, may progress to tuberculoid, borderline or lepromatous disease. Acute adverse episodes are termed erythema nodosum leprosum (ENL) in lepromatous persons

and reversal reactions in borderline leprosy. Serious consequences are the result of nerve impairment with resulting anesthesia that may lead to trauma, fractures and bone resorption.

## Etiology

*Mycobacterium leprae*

## Epidemiology

**Reservoir and Source:** Humans. Feral armadillos in Louisiana and Texas have been found naturally afflicted, and there have been reports suggesting that disease in armadillos has been naturally transmitted to humans.

**Transmission:** Not highly communicable. The exact mode of transmission is not clearly established but prolonged direct contact with infectious nasal discharge or skin secretions is important; untreated lepromatous patients shed large numbers of bacilli. The organisms probably gain entrance through the upper respiratory tract and possibly through broken skin. In cases in children under one year of age, transmission is presumed to be transplacental.

## Occurrence:

**General:** The world prevalence in 1994 was estimated to be 2.4 million cases. Prevalence rates of more than 5/1,000 are not uncommon in the rural tropics and subtropics; socioeconomic conditions may be more important to prevalence than climate. The chief endemic areas are in South Asia and Southeast Asia (Philippines, Indonesia, Papua New Guinea, some Pacific islands, India, Bangladesh, Burma and Indonesia); tropical Africa; and some areas of Latin America. The disease remains endemic in California, Hawaii, Louisiana, Texas and Puerto Rico.

**Manitoba:** Most cases have been previously diagnosed. There have been two new cases reported since 1991.

**Incubation Period:** The average incubation period is probably four years for tuberculoid leprosy and twice that for lepromatous leprosy (range nine months to 20 years). The disease is rarely seen in children under age three.

**Susceptibility and Resistance:** The persistence and form of leprosy depend on the ability to develop effective cell-mediated immunity. The high prevalence of antibodies specific for *M. leprae* among close contacts of leprosy patients suggest that infection is frequent but clinical disease occurs in only a small proportion.

**Period of Communicability:** Infectiousness is lost in most instances within three months of continuous and regular treatment with dapsone (DDS) or clofazimine, or within three days of treatment with rifampin.

## Diagnosis

Nerve involvement with acid-fast bacilli is pathognomonic of leprosy. Whenever possible, a skin biopsy confined to the affected area should be sent to a pathologist experienced in leprosy diagnosis. Clinical diagnosis is based on complete skin examination and signs of peripheral nerve involvement (hypoesthesia, anesthesia, paralysis, muscle wasting or trophic ulcers, or enlargement and tenderness with bilateral palpation of the ulnar nerve at the elbow, peroneal nerve at the head of the fibula or the great auricular nerve). Skin lesions are tested for sensation (light touch, pinprick, and temperature discrimination).

The organism does not grow in bacteriologic media or cell cultures. It can be grown in mouse footpads.

The lepromin test is an intradermal injection of autoclaved *M. leprae*; the presence or absence of induration at 28 days is called the Mitsuda reaction. The reaction is negative in lepromatous leprosy and positive in tuberculoid disease and in a proportion of normal adults; thus, the test gives prognostic information but is of no diagnostic value.

## Key Investigations

- History of immigration from endemic area.
- Past history of leprosy.
- For infectious cases, contacts should be referred to a dermatologist or infectious disease specialist for physical examination.

## Control

### Management of Cases:

- No public health interventions are required; communicability is low, particularly after initiation of treatment.
- Manage infectious persons with routine infection control precautions. Handwashing is the most effective measure to prevent transmission when caring for patients.
- Medications for treatment of leprosy will be provided free of charge if the patient is unable to purchase them.
- Hospitalization is reserved only for managing reactions, surgical correction of deformities and the treatment of ulcers resulting from the anesthesia of the extremities.
- No restrictions in employment or attendance at school are indicated for persons whose disease is regarded as noninfectious.

### Treatment:

- With the widespread prevalence of dapsone resistance and the emergence of resistance to rifampin, combined chemotherapy regimens are essential.
- Persons under treatment should be monitored for drug side effects, for leprosy reactions and for the development of trophic ulcers. Consultation with an infectious disease specialist is recommended.

- **Lepromatous leprosy**
  - The recommended regimen consists of daily rifampin, dapsone (DDS) and clofazimine. The treatment should be continued until skin smears are negative for at least two years.
- **Tuberculoid leprosy**
  - The recommended regimen consists of rifampin and dapsone, both for a period of six months.
- The initial examination of contacts and periodic examination of household and other close contacts is recommended periodically for several years after last contact with an infectious case.
- Chemoprophylaxis studies suggest that approximately 50% protection against disease can be achieved with dapsone or acedapsone, but this must be closely supervised.

### **Preventive Measures:**

### **Management of Contacts:**

- Immunization of contacts with BCG is not routinely practised, although in field trials in Uganda and Papua New Guinea, prophylactic BCG may have resulted in a considerable reduction in the incidence of tuberculoid leprosy among contacts.
- The best preventive measure is early diagnosis and treatment of cases.
- Health education should stress the availability of effective multidrug therapy, the non-infectivity of persons under continuous treatment and the importance of completing therapy.
- A vaccine of live BCG combined with killed *M. leprae* is under study.