

PUBLIC HEALTH REFERENCE SHEET

Leprosy



Name	<i>Mycobacterium leprae</i>
Reservoir & Transmission	Humans and armadillos Close contact, through nasal mucosa, possibly respiratory secretions
Incubation Period	Average between 3–10 years; range of a few weeks to 30 years
Common Symptoms	Discolored patches of skin, nodules, painless ulcers on soles of feet, painless swelling on face, numbness, muscle weakness, enlarged nerves
Gold Standard Diagnostic Test	Microscopic identification from skin biopsy
Risk Groups	Living in endemic areas, in close contact with multibacillary cases
Geographic Significance	India, Brazil, Indonesia, Africa, Southeast Asia

What is leprosy?

Hansen's disease, also known as leprosy, is an infection caused by the slow-growing bacteria, *Mycobacterium leprae*. It may take up to 20 years to develop signs of the infection, which can affect the nerves, skin, eyes, and lining of the nose. With early diagnosis and treatment, the disease can be cured. People with leprosy can continue to work and lead an active life during and after treatment. There are four classifications of the disease (described below), which are assigned after laboratory confirmation.

- **Tuberculoid (paucibacillary (PB))**: Considered a medical emergency, PB is an illness characterized by one or a few well-demarcated, hypopigmented, and hypoesthetic or anesthetic skin lesions; frequently with active, spreading edges and a clearing center; and peripheral nerve swelling or thickening also may occur. The body's immune response may also result in swelling of the peripheral nerves; these enlarged nerves may be palpated under the skin and may or may not be tender to the touch.
- **Lepromatous (multibacillary (MB))**: Considered a medical emergency, MB is an illness characterized by a number of erythematous papules and nodules or an infiltration of the face, hands, and feet, with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin; possibly reduced sensation with observed thickening of the peripheral nerves under microscopic examination; and the potential to involve other organs, the eyes, nose, testes, and bone. Frequent involvement of the nasal mucosa results in nasal congestion and epistaxis. The nodular form of this condition is the most advanced form of the disease. Ulcerated nodules contain large numbers of *M. leprae* acid-fast bacilli packed in macrophages that appear as large foamy cells.
- **Borderline (dimorphous)**: The most common form and of intermediate severity compared to PB and MB, in borderline disease the skin lesions seem to be of the tuberculoid type, but are more numerous, and may be found anywhere on the body. Peripheral nerves are affected with ensuing weakness and anesthesia.
- **Indeterminate**: An illness characterized by early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features but with definite identification of acid-fast bacilli in Fite-stained sections.

What is the occurrence of leprosy?

In the U.S., leprosy is very rare, with approximately 150 cases reported each year, and most became infected in a country where it is more common. Globally, about 250,000 cases are reported each year and up to 2 million are permanently disabled due to leprosy. In 2015, for the distribution of new leprosy cases by country among 136 countries that reported to the World

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Health Organization (WHO), the majority with >10,000 cases each were India, Brazil, and Indonesia. Between 1,000 and 10,000 cases were reported from Africa: The Democratic Republic of Congo, Ethiopia, Madagascar, Mozambique, Nigeria, and the United Republic of Tanzania; Southeast Asia: Bangladesh, Myanmar, Nepal, and Sri Lanka; and the Philippines.

How is leprosy transmitted?

Leprosy is not easily transmitted; it is not transmitted through casual contact (shaking hands, hugging, sitting next to each other), sexual contact, or mother to unborn baby during pregnancy. The bacterium may be transmitted through airborne droplets from nasal mucosa, possibly through respiratory secretions. Prolonged, close contact with someone with untreated leprosy over many months is needed to become infected. Most (95%) of the human population is naturally immune and thus not susceptible to infection with *M. leprae*. Once multidrug therapy is started, the person can no longer spread the disease to other people. Indirect transmission is unlikely, although the bacillus can survive up to 7 days in dried nasal secretions.

In the southern U.S., some armadillos are naturally infected with the bacteria that cause leprosy in people, thus transmission is possible. However, the risk is very low and most people who come into contact with armadillos are unlikely to contract leprosy.

Who is at risk for leprosy?

Persons at highest risk are those living in endemic areas or in close contact with a person who is infected but not being treated. Overall, the risk of contracting leprosy is very low. The disease is rarely seen in children younger than 3 years of age.

What are the signs and symptoms of leprosy?

In general, symptoms mainly affect the skin (e.g., raised or flat lesions), mucous membranes (e.g., nosebleeds), and nerves (thickened peripheral nerves). The first signs of leprosy are usually pale or slightly red areas or a rash on the trunk or extremities. Frequently, but not always, there is an associated decrease in light touch sensation in the area of the rash. There may also be a loss of feeling in the hands or feet and this change in sensation is a valuable clue to diagnosis. Nasal congestion may be a sign of infection, but infection is more often associated with changes of the skin on the face, such as thinning of the eyebrows or eyelashes. Symptoms caused by damage to the nerves are numbness or loss of sensation in the affected areas of the skin, muscle weakness or paralysis (especially in the hands and feet), enlarged nerves (especially those around the elbow and knee and in the sides of the neck), and eye problems that may lead to blindness (when facial nerves are affected). When loss of sensation occurs, injuries such as burns may go unnoticed.

What are potential complications of leprosy?

Complications may include painful or tender nerves, redness and pain around the affected area, and burning sensation in the skin. If left untreated, the signs of advanced leprosy can include:

- Crippling of hands and feet
- Paralysis
- Blindness
- Shortening of toes and fingers due to reabsorption
- Chronic non-healing ulcers on the bottoms of the feet
- Loss of eyebrows
- Saddle-nose deformity from damage to the nasal septum

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How is leprosy diagnosed?

Clinical assessment is confirmed with skin or nerve biopsy and acid-fast staining. There are no serological or skin tests for leprosy.

How is leprosy treated?

Leprosy is effectively treated and can be cured with a multidrug therapy using a combination of antibiotics depending on the form of the disease.

- Tuberculoid (paucibacillary (PB)): concurrently with daily dapsone and monthly rifampin.
- Lepromatous (multibacillary (MB)): daily clofazimine is added to daily dapsone and monthly rifampin.

Other antibiotics, such as clarithromycin, ofloxacin, levofloxacin, and minocycline also work well against *M. leprae*. Combination therapy helps prevent the development of antibiotic resistance, which may otherwise occur due to length of the treatment (between 1 to 2 years).

How can leprosy be prevented?

- For general health reasons, avoid contact with armadillos.
- Household contacts of people with leprosy should have a thorough physical examination annually for 5 years.

What are some public health considerations?

- Document the clinical form of the disease.
- Document the source of infection if known.
- Information about the National Hansen's Disease Program is available at <http://www.hrsa.gov/hansensdisease>.

References

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