

Just the Facts...

Leishmaniasis

Q. What is Leishmaniasis?

A. Leishmaniasis (leash' ma NIGH' a sis) is an infection of animals and humans caused by protozoa in the genus *Leishmania*. At least 23 *Leishmania* species cause leishmaniasis. There are three forms of the disease: cutaneous (CL), mucocutaneous (MCL) and visceral (VL). CL appears as a non-healing ulcer lasting months to years if untreated. MCL patients develop ulcerative or granulomatous (granular) lesions of the nasal, oral, and pharyngeal linings, which generally occur after or concurrent with CL lesions. VL, the most severe form of leishmaniasis with 95% mortality in untreated cases, is a chronic disease involving the liver and spleen. Species of *Leishmania* are associated with particular forms of the disease, however this correlation is not absolute. Leishmaniasis is also called kala-azar, Oriental sore, Delhi boil, and espundia. Leishmaniasis should not be confused with sand fly fever, which is a viral disease transmitted by sand flies.

Q. What is the geographic distribution of leishmaniasis?

A. CL and MCL occurs in the Middle East including Iran and Afghanistan, south central Asia including Pakistan and India, the southern regions of the former Soviet Union, the sub-Sahara African savanna and Sudan, the highlands of Ethiopia, Kenya, and Namibia, south central Texas, Mexico (especially Yucatan), all of Central America, the Dominican Republic, and all of South America except Chile and Uruguay. VL occurs in India, Bangladesh, Pakistan, China, southern regions of the former Soviet Union, the middle east including Turkey, the Mediterranean basin, Mexico, Central and South America (mostly Brazil), and in Sudan, Kenya, Ethiopia, and sub-Saharan African savanna.

Q. How does a person get leishmaniasis?

A. Transmission occurs through the bite of infective female phlebotomine sand flies in the genera *Phlebotomus* (Old World) and *Lutzomyia* (New World). Generally, sand flies feed at dusk and during the evening, however some species are opportunistic and will feed during the day if disturbed. The uninfected sand fly acquires the infection by feeding on a reservoir host. Reservoirs for leishmaniasis, which vary depending on location, include domestic dogs, rodents (including rats, hyraxes and gerbils), sloths, marsupials, and humans. It is reported that 90 species of *Lutzomyia* and at least 39 species of *Phlebotomus* feed on humans. It is not known, however, how many species can vector the disease. Person-to-person transmission by blood transfusion and sexual contact has been reported, but is rare.



Adult Sand Fly

Q. What are the symptoms of leishmaniasis?

A. CL starts with a papule that enlarges and becomes an ulcer. Lesions may be single or multiple. As mentioned above, certain strains can disseminate and cause mucosal lesions, even after the cutaneous lesions have healed. MCL is characterized by nasopharyngeal tissue destruction that can be very disfiguring. VL is typified by fever (which is irregular, often with two daily peaks), enlarged spleen and liver, anemia, reduction of white blood cells, progressive emaciation and weakness.



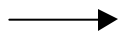
Leishmaniasis Lesions

Q. How is leishmaniasis diagnosed?

A. CL and MCL are diagnosed by microscopic identification of specimens from lesions. Serologic testing can be done, but may not be helpful in diagnosis. Diagnosis of VL is made by culture of the organism from a biopsy specimen or aspirated material, or from the appearance of amastigotes (a life stage of the parasite) in stained smears from bone marrow, the spleen, the liver, lymph nodes, or blood.

Q. What is the treatment for leishmaniasis?

A. Treatment is generally pentavalent antimonials such as Pentostam or Glucantime. Second line drugs are amphotercin B and pentamidine, however, these are not used routinely because of toxicity.



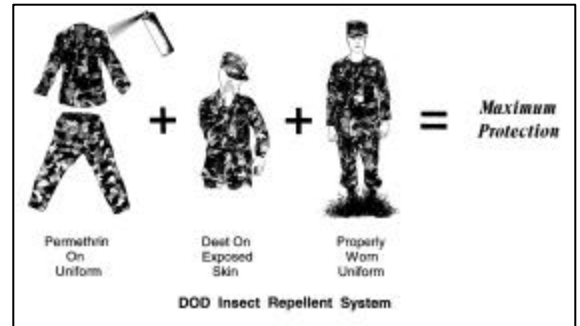
Q. What can I do to reduce my risk of contracting leishmaniasis?

A. Follow these precautions to help prevent leishmaniasis:

- Limit outdoor activity at dusk and during the evening when possible, when the sand fly is most active. If possible building should have window screens or other barriers to keep sand flies from entering.
- Avoid the bites of sand flies by using protective clothing and insect repellents as described below:
 - Sand flies bite in and outdoors; although generally nocturnal, they frequently feed during the day. Personal protective measures should be used at all times.
 - Wear long-sleeved shirt, long pants, and socks; wear loose-fitting clothing to prevent sand fly bites through thin fabric.
 - Use both skin and clothing repellents that have been approved by the United States Environmental Protection Agency (EPA). They are safe and effective.
 - For your skin, use a product that contains 20-50% **DEET** (N,N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective.
 - Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken or irritated skin.
 - To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
 - For your clothing, use a product that contains **permethrin**. **Permethrin** is available commercially for use on clothing as 0.5% aerosol spray formulations. **Permethrin** should be used only on clothing, never on skin. When using any insect repellent, always FOLLOW LABEL DIRECTIONS. Do not inhale aerosol formulations.

- For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to the proper wear of the battle dress uniform (BDUs) (pants tucked into boots, sleeves down, undershirt tucked into pants), this system includes the concurrent use of both skin and clothing repellents that are available in the military supply system:

- Standard military skin repellent: 33% **DEET** lotion, long-acting formulation, one application is effective for up to 12 hours, **NSN 6840-01-284-3982**.
- Standard military clothing repellents, either: aerosol spray, 0.5% **permethrin**, one application remains effective through 5-6 washes, **NSN 6840-01-278-1336**; or impregnation kit, 40% **permethrin**, one application remains effective for the life of the uniform (at least 50 washes), **NSN 6840-01-345-0237**. Do not dry clean treated BDU's. This will remove the permethrin from the fabric.



- Use bed net while sleeping; **NSN 7210-00-266-9736 (Netting)**, **NSN 7210-00-267-5641 (Poles)**. Because sand flies are small enough to pass through the mesh of the standard bed net, permethrin (aerosol spray) should be applied to netting. There is enough permethrin in one spray can to treat one uniform and a bed net.

Q. Where can I get more information on Leishmaniasis?

A. Contact the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Entomological Sciences Program, Aberdeen Proving Ground, Maryland 21010-5403: DSN 584-3613, CM (410) 436-3613: FAX – 2037; <http://chppm-www.apgea.army.mil/ento>

References:

- Beneson, A.S.** 1995. Control of Communicable Diseases in Man, 16th ed, American Public Health Association, Washington, DC. 577pp.
- Lawyer, Phillip G., and Perkins, Peter V.** 2000. Leishmaniasis and Trypanosomiasis. Pp. 231-298 in Bruce F. Eldridge and John D. Edman (eds.), Medical Entomology: A Textbook on Public Health and Veterinary Problems Caused by Arthropods. Kluwer Academic Publishers, Boston