

*Just the Facts...* *Leishmaniasis (leash' ma NIGH' a sis) is an infection of animals and humans caused by protozoa in the genus Leishmania. Leishmania parasites are transmitted by the bites of infected sand flies. At least 23 Leishmania species cause leishmaniasis. There are three forms of the disease: cutaneous (skin), the most common form; mucocutaneous (mucous membranes), a very rare form; and visceral (internal organs). Different species of Leishmania generally cause different forms of the disease. 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.*

### How does a person get leishmaniasis?

Transmission of *Leishmania* occurs via the bite of infected female phlebotomine sand flies (see left hand photo, above) in the genera *Phlebotomus* (Old World, or eastern hemisphere) and *Lutzomyia* (New World, or western hemisphere). These sand flies should not be confused with sand flies in the genus *Culicoides*, which are the type most common in the United States and which do *not* transmit *Leishmania* (see right hand photo, above). Generally, sand flies feed at dusk and during the night, although 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 *Leishmania*, 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. However, it is not known how many of these species can actually vector (carry and transmit) the pathogens. Rarely, leishmaniasis is spread by blood transfusion, contaminated needles, and from a pregnant woman to her baby.

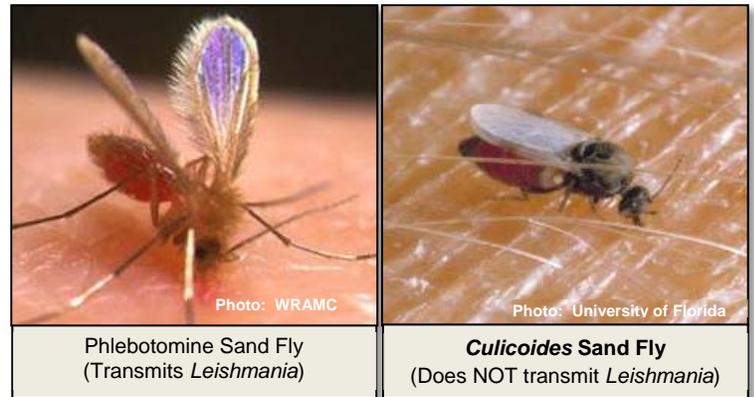


Photo: WRAMC  
Phlebotomine Sand Fly  
(Transmits *Leishmania*)

Photo: University of Florida  
**Culicoides Sand Fly**  
(Does NOT transmit *Leishmania*)

### Where is leishmaniasis found and how common is it?

Leishmaniasis is found in parts of about 90 countries. Areas include southern Texas, Central and South America, southern Europe, Asia, the Middle East, and Africa. It is not found in Canada, Australia, Oceania (islands in the Pacific), nor Southeast Asia. More than 90% of the world's cases of visceral leishmaniasis occur in India, Bangladesh, Nepal, Sudan, and Brazil. Most leishmaniasis in the Middle East is the cutaneous form. Approximately 1.5 million new cases of cutaneous leishmaniasis occur throughout the world each year. The number of new cases of visceral leishmaniasis is thought to be about 500,000.

### What are the symptoms of leishmaniasis?

Symptoms begin weeks to months following an infectious sand fly bite. Because of this delay in presentation, it is important to tell your health care provider where you have traveled and that you might be at risk for leishmaniasis (see inset for DoD Helpline). Cutaneous leishmaniasis starts at the site of a sand fly bite with a papule that enlarges and becomes an ulcer. It often develops a raised edge with central crater, giving it a volcano-like appearance. Sores may be single or multiple, and swollen lymph nodes may be present near the sores (for example, under the arm if the sores are on the arm or hand). Rarely, some species of *Leishmania* found in Central and South America can spread from an initial cutaneous sore on the face to affect the mucous membranes of the nose and mouth. This mucocutaneous form of leishmaniasis can be very disfiguring. Visceral leishmaniasis is typified by chronic fever, enlarged spleen and liver, anemia, weakness, progressive emaciation and weight loss. It is the most severe form of leishmaniasis and is often fatal if left untreated.

### PHYSICAL MANIFESTATIONS OF LEISHMANIASIS



Photo: WRAMC Photo: WRAMC Photo: WRAMC Photo: AFPMB  
Cutaneous leishmaniasis



Photo: AFPMB  
Mucocutaneous leishmaniasis

Photo: WRAMC  
Visceral leishmaniasis

**Leishmaniasis ~ DoD Helpline for Veterans and Family Members**

US Toll Free: 1-800-796-9699

Local: 202-782-3577 (or DSN 662)

From Europe Toll Free: 00800-8666-8666

Outside US DSN: 312-662-3577

**How is leishmaniasis diagnosed?**

Diagnosis of leishmaniasis is made by observation of skin sores that don't heal and by microscopic identification or culture of the parasite from specimens taken directly from the sores. Blood tests can be useful, particularly for cases of visceral leishmaniasis. Diagnosis can be difficult.

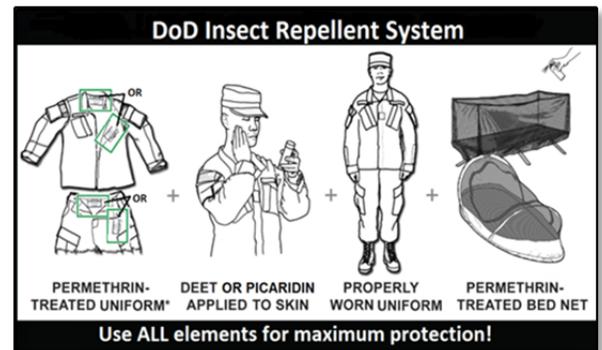
**What is the treatment for leishmaniasis?**

Cutaneous leishmaniasis sores are self-limited, although withholding treatment may prolong the duration of the ulcers and/or result in more scarring. Based on the severity and age of the lesions, treatment may include cryotherapy (freezing) with liquid nitrogen or heat (ThermoMed device). Pentavalent antimonials, especially sodium stibogluconate (e.g. Pentostam®), are often used to treat all types of leishmaniasis. Second line drugs are amphotericin B and pentamidine; however, these are not used routinely because of their toxicity.

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

There are no pills or vaccines to protect against leishmaniasis. Sand fly activity in an area may be underestimated because sand flies make no sound when they fly, and the first bites a person receives may not be noticed. However, sand fly bites can quickly become numerous, painful, and very distracting (see photo to right). Follow these precautions to help prevent the sand fly bites that can lead to leishmaniasis and other diseases such as sand fly fever:

- Limit outdoor activity from dusk to dawn if possible, because this is when sand flies are most active. If possible, buildings or tents should be either air-conditioned or should have window screens or other barriers to help keep sand flies from entering. However, since sand flies are much smaller than mosquitoes (approximately one-third the size), they can oftentimes work their way through standard window screens (16-18 mesh/in<sup>2</sup>) and even standard military bed netting (25-27 mesh/in<sup>2</sup>).
- Sand flies bite both indoors and outdoors. Although generally nocturnal, they also frequently feed during the day. Personal protective measures should be used at all times:
  - Wear proper clothing as a physical barrier against sand flies – long pants tucked into boots or tightly-woven socks; long sleeved shirt; shirt (or undershirt) tucked into pants.
  - Use both skin and clothing repellents that have been approved by the United States Environmental Protection Agency (EPA). They are safe and effective. Be sure to FOLLOW LABEL DIRECTIONS.
  - 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, even layer.
  - Wash DEET off when your exposure to sand flies ceases; then reapply as necessary.
  - For your clothing, use a product that contains permethrin. Permethrin is available commercially for use on clothing as 0.5% aerosol spray formulations. Clothing that is factory-impregnated with permethrin may also be purchased commercially. Permethrin will withstand numerous launderings.
  - Permethrin should only be used on clothing and netting, never on skin.
- For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the military field uniform (e.g. ACUs, BDUs) (pants tucked into boots, sleeves down, undershirt tucked into pants), this system includes the concurrent use of both skin and clothing repellents:
  - Standard military skin repellent: 33% **DEET** lotion, long-acting formulation, one application lasts up to 12 hours, **NSN 6840-01-284-3982**.
  - Standard military clothing repellents: either the IDA (impregnation kit), 40% **permethrin**, one application lasts the life of the uniform (approximately 50 washes), **NSN 6840-01-345-0237**; or if not available, aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes, **NSN 6840-01-278-1336**. Trained personnel may use the 2-gallon sprayer product (**NSN 6840-01-334-2666**) for mass treatments. Factory permethrin-treated ACUs are also available via contract [Contact the Armed Forces Pest Management Board (AFPMB) for details, DSN 295-7476; CM (301) 295-7476].



- Treat standard military bed netting with permethrin to prevent entry of sand flies. Use permethrin aerosol spray can or 2-gallon sprayer. Light-weight, self-supporting, pop-up bed nets are also available. They have finer mesh (30-plus) than the standard net, and are already treated with permethrin at the factory. Order NSN 3740-01-516-4415 (OD green, camouflage) or NSN 3740-01-518-7310 (coyote brown).

*Use of trademarked name does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product. For more information please consult the APHC website - <http://phc.amedd.army.mil>*