

# Leptospirosis

## Medical Summary

### Introduction

Leptospirosis is an acute zoonotic illness that is caused by spirochetes belonging to the genus *Leptospira*; the disease occurs throughout the world. A vast range of animals, including amphibians, reptiles, and mammals, can be infected and become reservoirs when the microorganisms settle in the renal tubular epithelium, from where they are excreted with the urine for prolonged periods of time. The tissues of parturition of infected animals also contain large numbers of organisms. Although *Leptospira* are relatively labile organisms that die quickly in dry environments, they can persist for months in freshwater bodies and moist vegetation or soil.

### Mode of Transmission

Humans become infected with *Leptospira* by contact with contaminated freshwater, soil, or tissues of infected animals. Leptospire gain access to the body through skin lesions or abrasions, intact mucous membranes, or waterlogged skin after prolonged immersion. A small proportion of cases are acquired through inhalation of contaminated aerosols or ingestion of infected tissues. The disease is considered a zoonosis because humans usually do not become chronic carriers as do other animals, and human-to-human transmission is rare, if it occurs at all. The incubation period of leptospirosis ranges from 2 to more than 30 days, but most cases present 5 to 14 days after exposure.

### Epidemiology

Leptospirosis is considered the most widespread zoonosis worldwide, with a peak incidence during or immediately after rainy seasons. Most temperate and tropical areas of the world report transmission of leptospirosis, although reliable incidence figures are not available for many regions. The overall incidence in the United States is about 100-200 new cases per year, more than half of which occur in Hawaii. Intense precipitation, flooding, and tropical storms have been the background for several epidemics in the Caribbean and Central America, where walking through bodies of water has been significantly associated with contracting leptospirosis. Because of the low incidence of malaria in travelers to Southeast Asia, leptospirosis is the most common cause of life-threatening infection in travelers to that region. Outbreaks in urban areas are frequently associated with the presence of infected rodents and dogs in the community, which serve as permanent reservoirs. Epidemics involving travelers have occurred among white-water rafters in Costa Rica and participants in the Eco-Challenge 2000 race in Malaysia, and an outbreak was reported among triathletes exposed to the waters of Lake Springfield, Illinois, U.S. Reported cases of leptospirosis among European travelers most commonly have been acquired in Southeast Asia. Of importance when considering the diagnosis of leptospirosis in a febrile returned traveler, the vast majority of these cases could provide a clear history of exposure to freshwater bodies.

### Risk Factors

Travelers to endemic areas who engage in water sports (including rafting and kayaking) in natural freshwater bodies (particularly in developing countries), hiking, biking, or camping are at high risk for acquiring leptospirosis, especially during or soon after seasons of high precipitation. Similarly, persons staying at facilities with poor hygienic standards, particularly where wild rodents are present in or around human habitation, can become inadvertently exposed. Individuals whose work or hobbies expose them to animals or heavily contaminated environments, such as hunters, veterinarians, dairy farmers, abattoir workers, rice farmers, and military personnel, have also been found to be at risk.

## Clinical Presentation

### Typical

The severity of the clinical manifestations of leptospirosis is highly variable, ranging from minimally symptomatic to fatal cases. Classically, the clinical course of leptospirosis is divided into 2 phases. The acute (septicemic) phase is characterized by the sudden onset of high-grade, remittent fever, chills, headache, severe myalgia, conjunctival edema, and a variety of gastrointestinal symptoms. A minority of patients also develop a pretibial maculopapular rash during this phase. As IgM antibodies are produced around 1 week into the illness, there is a short-lived defervescence that marks the end of the septicemic phase. Subsequently, the immune phase begins, during which up to 80% of patients develop an aseptic meningitis syndrome with intense headache, photophobia, ocular pain, and variable mental status changes. Other prominent features of this phase include hepatosplenomegaly, conjunctival hemorrhage, and palpable purpura. Early in the disease, symptoms may be indistinguishable from malaria, dengue, viral hepatitis, or typhoid fever.

### Atypical

About 10% of patients with leptospirosis develop Weil's disease, a severe clinical syndrome that occurs after the septicemic phase and is characterized by rapidly progressive renal and hepatic dysfunction, with marked conjugated hyperbilirubinemia. Other manifestations include hemorrhagic pneumonitis, shock, and various cardiac arrhythmias. While death from "typical" acute leptospirosis is rare, mortality associated with Weil's disease has been reported to be as high as 40% in some series.

## Prevention Strategies

The main prevention strategy is to avoid exposure to potentially contaminated water, soil, and mud, as well as animal tissues or urine. Bodies of water that represent the highest risk are those around which there are extensive populations of such animals as rodents, possums, raccoons, skunks and foxes, which are known to be frequently infected. Although a vaccine exists for animal use that can be useful in reducing transmission to other animals and humans, especially in epidemic situations, limited experience with vaccination of humans suggests that the limited number of serovars in the vaccine elicits only a partially protective response.

*Preexposure chemoprophylaxis* with doxycycline 200 mg PO weekly can drastically reduce the risk of acquiring leptospirosis in individuals at high risk due to unavoidable contact with contaminated water or soil. (Start the 200 mg weekly regimen 1-2 days before exposure and continue for as long as exposure continues.) Although the trials supporting the efficacy of this regimen were done among military personnel destined to training exercises in the Central American jungle, it is currently recommended for outdoor adventure travelers who plan to engage in high-risk activities such as prolonged hiking, biking, or water sports in endemic areas, as well as for persons in areas of recent flooding.

*Postexposure chemoprophylaxis* with doxycycline (for those not taking preexposure chemoprophylaxis and with high-risk exposure in an area with previously documented cases) may be taken as:

- 1 dose of 200 mg PO if asymptomatic
- 100 mg PO bid x 7 days as empiric treatment if mild symptoms consistent with leptospirosis exist

## Need for Medical Assistance

Because severe forms of leptospirosis can occur even after a typical, initially benign clinical course, travelers suspected of having been exposed to or become infected with leptospirosis should seek medical assistance whenever possible. Ideally, severe cases should be treated in a center with experience in handling such patients, as serious reactions to the destruction of leptospire by antibiotics have been reported.

*Travax content represents decision-relevant, expert synthesis of real-time data reconciled with new and existing available advice from authoritative national and international bodies. Recommendations may differ from those of individual countries' public health authorities.*

---

© 2016 Shoreland, Inc. All rights reserved.