

# LEPTOSPIROSIS

[Weil's disease, Hemorrhagic jaundice (*Leptospira icterohaemorrhagiae*), canicola fever (*L. canicola*), dairy worker fever (*L. hardjo*)]

**SPECIES:** rodents, domestic, and wild animals

**AGENT:** Spirochete, *Leptospira*. Pathogenic leptospire belong to the species *Leptospira interrogans*, which is subdivided into more than 200 serovars. The main natural reservoirs for human infection vary with serovar: *L. canicola* in dogs, *L. hardjo* in cattle, *L. pomona* in swine, and *L. icterohaemorrhagiae* in rats.

**RESERVOIR AND INCIDENCE:** Rats, mice, field moles, guinea pigs, gerbils, squirrels, rabbits, hamsters, reptiles, nonhuman primates, livestock, and dogs. In one study, 40 % of stray dogs were seropositive. Rats and mice are common animal hosts for *L. ballum*. Infection in mice is inapparent and can persist for the animal's lifetime. \*Rodents are the only major animal species that can shed leptospire throughout their life-span without clinical manifestations. Active shedding by lab animals can go unrecognized until personnel handling the animals become clinically ill.

**TRANSMISSION:** Handling infected animals, contaminating hands, or abrasions with urine, or aerosol exposure during cage cleaning are most common. The organism is often transmitted to humans by the urine of the reservoir host. The organism may also enter through minor skin lesions and probably via the conjunctiva. Many infections have followed bathing or swimming in infected waters.

**DISEASE IN ANIMALS:** In cattle, fever and anorexia occur with rapid decline in milk yield and atypical mastitis. Pregnant cows abort with retention of the placenta. Also, mild jaundice and severe anemia occurs with enlarged and friable liver and swollen kidneys. In pigs subclinical infection is common, though it can cause abortion and birth of weak piglets. In dogs and cats, gastroenteritis, jaundice, and nephritis may occur.

**DISEASE IN MAN:** Ranges from inapparent infection to severe infection and death. Biphase illness a. Weakness, headache, myalgia, malaise, chills, & fever. b. Leukocytosis, painful orchitis (testes not usually enlarged), conjunctival effusion, and rash. Icteric leptospirosis (Weil's syndrome-usually caused by *L. icterohaemorrhagiae*) is the most severe form of the disease, characterized by impaired renal and hepatic function, abnormal mental status, hypotension, and a 5-10% mortality rate. Signs and symptoms are continuous and not biphasic.

**DIAGNOSIS:** Early in the disease, the organism may be identified by darkfield examination of the patient's blood or by culture on a semisolid medium. Culture is difficult and requires several weeks. A rapid diagnosis is made with the DOT-ELISA test. \*Leptospire can be recovered only from mature mice even though antibodies can be detected from infected mice of all ages.

**TREATMENT:** Penicillins or tetracyclines. Can eliminate *L. ballum* from a colony (mice) with 1000 gm chlortetracycline HCL/Ton of feed for ten days.

**PREVENTION\CONTROL:** Vaccination in cattle, swine, and dogs. Avoid swimming in or drinking potentially contaminated water. Protect workers by providing boots and gloves, and practicing good hygiene. \*\*Wild Rodent control. Drain wet ground. Doxycycline chemoprophylaxis for persons at high exposure.

**BIOSAFETY LEVEL:** BL-2

*(This publication is courtesy of the University Research Compliance Office, Kansas State University.)*