

# Leptospirosis

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## BASIC INFORMATION

### Description

Leptospirosis is a zoonotic (transmitted from animals to humans), multiorgan disease of dogs, livestock, and many other animals, as well as people. It occurs only rarely in cats. Various animals serve as reservoirs, including the mouse, rat, raccoon, opossum, and deer.

### Causes

Leptospirosis is caused by different types of *Leptospira* bacteria (leptospire). Leptospire are shed in the urine of infected animals and are transmitted by direct or indirect contact. Direct transmission occurs through contact with infected urine; during breeding; from mother to offspring through the placenta; via bite wounds; or by eating infected tissues. Crowding of dogs in kennels can enhance direct transmission. Indirect transmission occurs through exposure to contaminated water, soil, food, or bedding. Disease outbreaks often occur during or immediately after periods of heavy rain or flooding.

Leptospire enter the blood and other tissues, where they reproduce and cause inflammation that damages many parts of the body, such as the kidneys, liver, spleen, central nervous system (brain and spinal cord), eyes, and genital tract.

### Clinical Signs

Clinical signs in cats are mild or inapparent. Signs in dogs can be variable, depending on the organs most affected. In very acute (sudden) infections, large numbers of organisms may circulate in the blood, leading to shock and death. More often, fever, shivering, and decreased appetite are the first signs. Vomiting and dehydration follow. The animal may be reluctant to move. Coughing, difficulty breathing, and inflammation of the eyes (redness, pain) may occur. Progressive deterioration in kidney function may result in decreased or no urine production. Jaundice (yellowing of the skin and gums) may arise from liver damage.

### Diagnostic Tests

Results from several laboratory tests can be used to diagnose leptospirosis, including the following:

- A complete blood cell count is important to evaluate red and white blood cell and platelet numbers.
- A blood chemistry profile helps to evaluate liver and kidney function and electrolyte values.
- Urine tests are also used to evaluate liver and kidney function.
- The microscopic agglutination test (MAT) for antibodies in the blood can be used to confirm the diagnosis. Antibody tests early in illness are often negative, so follow-up tests 2-3 weeks after the onset of illness must often be done.

- Polymerase chain reaction (PCR) tests may be done to detect *Leptospira* DNA, but they are not available from all laboratories.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Severely affected animals need hospitalization and intensive care. Intravenous fluids may be needed to correct dehydration. A urinary catheter may be inserted so that urine output can be accurately measured in animals with decreased or no urine production.

Antibiotics that kill the leptospire are started as soon as possible in order to reduce some of the serious and possibly fatal complications of the disease, such as liver and kidney failure. Penicillin-type antibiotics are often the drugs of choice for initial treatment and are given for 2 weeks. Another antibiotic, doxycycline, may then be started to minimize or eradicate shedding of the bacteria in the urine. It is usually started after penicillin therapy is completed and is usually given for 2-4 weeks. Alternatively, doxycycline may be used for the entire treatment.

During treatment, infected animals should be isolated to prevent accidental contact with other animals. The infection may be transmitted to other pet animals and to humans by contact with infected urine. Gloves are worn when handling bedding and other items that may have been contaminated with urine or when cleaning urine from the environment. Facemasks and goggles may be worn when hosing down contaminated kennels. There is useful information about leptospirosis in pets at the Centers for Disease Control and Prevention website, [www.cdc.gov/ncidod/dbmd/diseaseinfo/leptospirosis\\_g\\_pet.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/leptospirosis_g_pet.htm).

### Follow-up Care

Intensive monitoring is often needed for hospitalized animals. Following recovery, laboratory tests are usually repeated to evaluate liver and kidney function and, sometimes, antibody levels. It may be necessary to disinfect areas of the animal's environment with diluted bleach. It is very important to remove organic debris (feces, dirt) before disinfecting the area, because the debris can decrease the effectiveness of the disinfectant. Bleach should not be used on grassy areas. Vaccination is available for several *Leptospira* species.

### Prognosis

As many as 25% of dogs with very severe leptospirosis do not survive. Most dogs, however, respond well to treatment. Long-term liver or kidney disease may occur, even with appropriate treatment.

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