

# Leptospirosis

## ABOUT THE DIAGNOSIS

Leptospirosis is a bacterial disease that is a worldwide problem. It is contracted through exposure to stagnant or slow-moving water that contains *Leptospira* bacteria, which usually enter a water source after being shed in the urine of an infected animal (commonly cattle).

An important cause of acute and chronic disease in dogs, leptospirosis can cause disease in other animals and in humans. Leptospirosis in cats is very rare. Dogs are routinely vaccinated for prevention of at least two, and preferably four, types of *Leptospira* bacteria, but other strains (or “serovars”) can still infect vaccinated dogs. The disease is more common in dogs that are exposed to large numbers of other dogs or have access to ponds or wet areas. Transmission of the disease also can occur from direct contact with an infected animal, contact with postabortion discharge, or sexual contact; contact with urine or urine-contaminated surfaces or environments (outdoors) remains the most common route of disease transmission for leptospirosis. *Leptospira* bacteria can penetrate intact or broken skin and mucous membranes. The organisms can persist in soil and standing water, especially in warm, wet climates. Wildlife harboring *Leptospira* can contaminate ponds and other areas of standing water, and these animals, along with cattle, are a major source of the *Leptospira* organisms. Dogs at increased risk for leptospirosis logically include those with access to wet areas or ponds, such as hunting dogs or hiking dogs, particularly those that enjoy playing in wet areas or swimming. Also, dogs with high exposure to other dogs, such as urban dogs or show dogs, are at higher risk of developing leptospirosis.

Most dogs with leptospirosis in fact show no symptoms of illness. They simply become chronic carriers of the disease and shed bacteria in the urine with no outward signs of illness, which can then lead them to infect other animals or humans. Dogs that do show symptoms of leptospirosis generally have acquired a larger exposure (more organisms) or have been exposed to strains that their immune systems cannot eliminate easily. Typical symptoms of leptospirosis can include any combination of weakness and loss of appetite (often due to fever), stiffness due to sore muscles, vomiting, diarrhea, bleeding from the nose or mouth, cough, excessive thirst and urination, and yellow mucous membranes (gums, whites of eyes; also called jaundice). These symptoms are vague and nonspecific: there may be only one or two of these in any given case, so confirmatory testing is always necessary before concluding that leptospirosis is the problem.

In animals with leptospirosis, the bacteria spread throughout the body, invading and multiplying in the liver and kidneys. Acute kidney failure and inflammation of the liver (leptospirosis hepatitis) are common in dogs showing overt symptoms due to leptospirosis. Even dogs that do not show outward signs of infection may harbor the bacteria in the kidneys indefinitely and may later develop kidney failure. In pregnant animals, leptospirosis can cause abortion and stillbirths.

In acute leptospirosis, routine laboratory tests such as a complete blood count, chemistry profile, and urinalysis may indicate dehydration, kidney failure, and liver disease. Serum from a blood sample can be submitted to a laboratory for a leptospirosis antibody titer, which is an indicator of the body’s active fight against a *Leptospira* infection. At the initial time of illness, the titer may be low. A second sample submitted 2 weeks later then confirms the diagnosis, since the test measures antibodies the dog makes in

response to the infection and these antibodies typically are made during the infection and last for months thereafter. Other tests using fluorescent antibodies to *Leptospira* can be used to look for the organism under a microscope, using urine or tissue samples. Since these tests are specialized and may take a while (days to weeks) to be finalized, a veterinarian’s “working diagnosis” (reasonable suspicion) of leptospirosis justifies beginning treatment for it immediately, because waiting for the test results may allow leptospirosis to become very severe or even life-threatening during that time.

## LIVING WITH THE DIAGNOSIS

Leptospirosis is a zoonotic disease, which means that it is a disease of animals that can be contagious to people. If your dog is diagnosed with leptospirosis, precautions are essential to avoid spread of the infection to humans or other pets. Since the spread is through body fluids and secretions, all bedding and kennels should be handled with utmost hygiene (gloves; wash hands afterwards and before touching your face; etc.) and always disinfected. Care should be taken to avoid exposure especially to urine or postabortion vaginal discharges. The bacteria can even penetrate through intact skin! The bacteria are shed in the urine and can survive well in warm, moist environments. Therefore, any contact with body fluids of an animal with leptospirosis, such as a urinary “accident” indoors that needs to be cleaned up, must be done with gloves and strict hygiene in which there is no contact between the urine and any person or animal. Dogs in contact with the infected dog should be tested for inapparent infection. Dogs that have not shown signs of illness still may become chronic carriers and shedders of the organism and, therefore, need to be detected and treated to avoid the risk of perpetuating the disease.

## TREATMENT

Dogs with symptoms of illness caused by leptospirosis generally need intensive in-hospital treatment for dehydration, kidney failure, acute liver inflammation, or any combination of these problems caused by leptospirosis. Blood transfusions may be needed if significant bleeding has occurred, which is possible in cases of leptospirosis. Antibiotics are used for treating the *Leptospira* infection; often, two types of antibiotics are used because certain antibiotic classes are good at stopping shedding but do not kill *Leptospira*, whereas other antibiotic classes do the exact reverse. The outlook is variable; dogs that are treated early and have a mild case of the disease generally do well and regain a normal life after treatment, whereas severely affected dogs may develop irreversible liver and/or kidney failure and die or be euthanized as a result of this disease. Antibiotic treatment is necessary to eliminate the bacterial infection in apparently healthy carrier dogs.

## DOs

- Avoid contact with animal urine. While this recommendation sounds self-evident, cattle urine may be carried in runoff through streams and into ponds, and wildlife may shed *Leptospira* in urine that accumulates in ditches or marshes. Even dogs that are apparently healthy can be carriers of leptospirosis and can shed the bacterium (creating the risk for human or animal infection), especially in the urine.
- If a pregnant dog loses the pregnancy (spontaneously aborts) or has stillborn puppies, use impervious gloves and strict

hygiene measures when handling the puppies or any bedding contaminated with discharges to prevent exposure to infection.

- Be aware of the environment where leptospirosis is most likely to be found and avoid it with your dog(s). Moist environments with stagnant water or wetlands, especially if downstream from farms or property where cattle are kept, are prime reservoirs for *Leptospira* bacteria.
- Vaccinate your dog prior to the possibility of exposure. The vaccine helps fight off two (most brands) or four (newer vaccine) strains of leptospirosis. Vaccines are preventative; a vaccine will not help (and cannot be given safely) once an animal has contracted the disease.
- Realize that some animals have allergic reactions to vaccines; therefore, the decision for whether or not to vaccinate against leptospirosis should be made after a discussion with your veterinarian regarding risk factors and likelihood of being exposed to leptospirosis.

### DON'Ts

- Don't delay in seeking your veterinarian's help if your dog shows any of the symptoms listed above. Once a dog has contracted leptospirosis, the disease can move from being curable to being potentially fatal in a matter of days.

### WHEN TO CALL YOUR VETERINARIAN

- If you see any of the symptoms listed above.
- If there appears to be any intolerance to medication; do not stop medication without first consulting the prescribing veterinarian. For example, premature ending of medications because a pet "looks fine now" may lead to a persistence of the bacteria in the system and a carrier state, which is a risk to other animals and humans.

### ROUTINE FOLLOW-UP

- Visits should be scheduled to monitor treatment and recovery. A second blood sample for antibody titers may be needed two weeks after the initial sample to definitively confirm the diagnosis of leptospirosis.

### ADDITIONAL INFORMATION

- The *Leptospira* component of canine vaccinations sometimes causes allergic reactions. If your dog cannot be vaccinated for leptospirosis due to allergic reactions, be sure to reduce his/her risk of exposure by keeping him or her away from ponds and low-lying, wet areas and limiting contact with other dogs. Because of the potential of the spread of the disease to people and the severity of the acute disease, all other dogs should be vaccinated. Dogs at high risk of exposure should be vaccinated every 3 to 6 months, since vaccine-induced immunity may not be sufficient to prevent disease for a full year. Vaccination with most vaccines only protects against two serovars (strains) of *Leptospira*; other strains can still cause illness in vaccinated dogs. Furthermore, although vaccination may prevent illness, it does not necessarily prevent the chronic carrier state. Therefore, you should inquire from your veterinarian if the general area where your dog is outdoors is known to harbor leptospirosis.

