

Leptospirosis is a serious, zoonotic (contagious to people) bacterial disease that affects dogs, people, and many other animals, most often causing kidney and liver damage in dogs.

What leptospirosis is

Leptospirosis is caused by spiral-shaped bacteria called *Leptospira* that live in the kidneys of infected animals and are shed in urine. The bacteria survive for weeks to months in moist soil and standing water, so dogs are usually infected when they drink, swim in, or walk through contaminated water or mud and then lick themselves. Because many wild mammals (especially rodents and raccoons) can carry the bacteria without looking sick, suburban and urban dogs are also at risk, not just farm or hunting dogs.

How dogs get infected

Infection typically happens when *Leptospira* enter the body through:

- Small cuts or abrasions in the skin
- Mucous membranes (eyes, nose, mouth)
- Drinking contaminated water

Once inside, the bacteria spread via the bloodstream and settle mostly in the kidneys and sometimes the liver and lungs. Dogs can start shedding the bacteria in urine before they look ill, which is why an apparently healthy but infected dog can pose a risk to other animals and to people.

Symptoms in dogs

Leptospirosis has a wide range of presentations, from very mild to rapidly fatal. Common signs include:

- Lethargy, fever, stiffness, and muscle pain
- Vomiting, diarrhea, poor appetite, abdominal pain
- Increased or decreased urination and thirst
- Jaundice (yellow gums/eyes) if the liver is affected
- Red spots or bruising on gums or skin, nosebleeds, or blood in stool or vomit
- Difficulty breathing or coughing if the lungs are involved
- Dark colored urine

In many cases, the first clear problem is acute kidney injury: the dog may drink and urinate excessively at first, then progress to very little or no urine output, with worsening vomiting and weakness. Any sudden, flu-like illness in a dog with vomiting and changes in urination should be treated as an emergency.

Diagnosis

Veterinarians diagnose leptospirosis using a combination of:

- Physical exam and history (especially recent exposure to ponds, puddles, wildlife, or flooded areas)
- Blood tests to look for kidney and liver damage and electrolyte changes
- Urinalysis to check concentration, protein, blood, and the presence of bacteria
- Specific leptospirosis tests, such as:
 - PCR (detects *Leptospira* DNA in blood or urine, often positive early in disease)
 - MAT (microscopic agglutination test) antibody titers, usually done in paired samples 1–2 weeks apart to show a rising titer

Because waiting for confirmatory tests can take days, vets usually begin treatment as soon as leptospirosis is strongly suspected.

Treatment

Treatment for leptospirosis has two main pillars: antibiotics to clear the bacteria and intensive supportive care to protect organs.

- Antibiotics:
 - A penicillin-type antibiotic is commonly started early to control the acute bloodstream infection.
 - Doxycycline is typically given for at least 2 weeks to clear the bacteria from the kidneys and stop long-term shedding.
- Supportive care:
 - Intravenous fluids to correct dehydration, support the kidneys, and balance electrolytes
 - Antiemetics for vomiting, pain medication, and stomach/intestinal protectants
 - Liver support medications if there is liver damage

- In severe kidney failure, dialysis (hemodialysis or continuous renal replacement therapy) may be needed in specialty centers

With rapid diagnosis and aggressive therapy, many dogs recover, but some are left with reduced kidney function, and severely affected dogs can die despite treatment.

Prognosis

Outcome depends on:

- How early treatment starts
- How severely the kidneys, liver, or lungs are damaged
- Whether dialysis is available if needed

Dogs treated in the early stages and with only mild organ changes often recover fully. Dogs with severe kidney failure, significant jaundice, or lung hemorrhage have a guarded to poor prognosis. Even recovered dogs may need long-term kidney-friendly diets and regular monitoring.

Risk to humans

Leptospirosis is a zoonotic disease, meaning it can infect people. People can become infected by:

- Contact with urine from an infected dog (especially cleaning up accidents without gloves)
- Contact with contaminated water, soil, or bedding
- Exposure of broken skin, eyes, nose, or mouth to contaminated material

Household members should:

- Wear gloves when cleaning urine or soiled bedding
- Use disinfectant on contaminated surfaces
- Wash hands thoroughly after handling the dog or its waste
- Avoid letting the dog lick their face, especially while the dog is acutely ill

If anyone in the household develops flu-like symptoms, jaundice, or severe headache after a dog is diagnosed with leptospirosis, they should see a physician promptly and mention the dog's illness.

Prevention in dogs

Prevention focuses on both vaccination and environmental management.

- Vaccination:
 - Modern leptospirosis vaccines for dogs cover several of the common serovars (strains) most likely to cause disease.
 - They are typically given yearly (or more often in very high-risk areas), often combined with other core vaccines.
 - Vaccination greatly reduces the risk of severe disease, although no vaccine covers every possible strain.
- Environmental and lifestyle measures:
 - Avoid letting dogs drink from or swim in stagnant or slow-moving water such as puddles, ditches, and small ponds, particularly in warm, wet seasons.
 - Discourage wildlife and rodents around the home by securing trash, removing food sources, and cleaning up spilled birdseed or pet food.
 - Keep dogs on leash in high-risk areas so they are less likely to wade in unknown water sources or investigate rodent-infested spots.
 - For farm, hunting, or working dogs, discuss a tailored prevention plan with a veterinarian, as their exposures are often higher.

Leptospirosis in cats

Leptospirosis in cats is much more rare than in dogs but can have similar symptoms. It is now believed it can play a role in chronic kidney disease in cats. Outdoor cats that hunt are at an increased risk. Leptospirosis in cats is treated similarly to dogs. There is no vaccine for cats so keeping cats indoors is the best way to prevent infection.

When to call the vet

You should contact a veterinarian urgently if your dog:

- Becomes suddenly very lethargic
- Has vomiting and diarrhea plus changes in drinking or urination
- Develops yellow gums or eyes

- Has recently had exposure to floodwater, ponds, or heavy rodent activity and now seems sick

Early treatment can be the difference between a full recovery and life-threatening organ failure.