

# INVESTIGATING LEPTOSPIROSIS IN DOGS

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Purina and the AKC Canine Health Foundation have worked together since 1997 to support canine health research to benefit all dogs.

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Linking a dog's subtle signs of leptospirosis, occasional bouts of less energy and lack of appetite, with having been exposed to the potentially deadly bacterial pathogen, *Leptospira interrogans*, can be a lifesaver. The sooner treatment begins, the better.

A zoonotic disease found throughout the U.S., leptospirosis is transmitted via contact with urine from infected animals and areas and objects contaminated with this bacteria. Wet environments and stagnant water, particularly in locations with lots of raccoons or rodents, could possibly teem with the pathogen that can live for many months. As dogs splash through streams and ponds, lapping a drink as they go, they become vulnerable to contracting the pathogen.

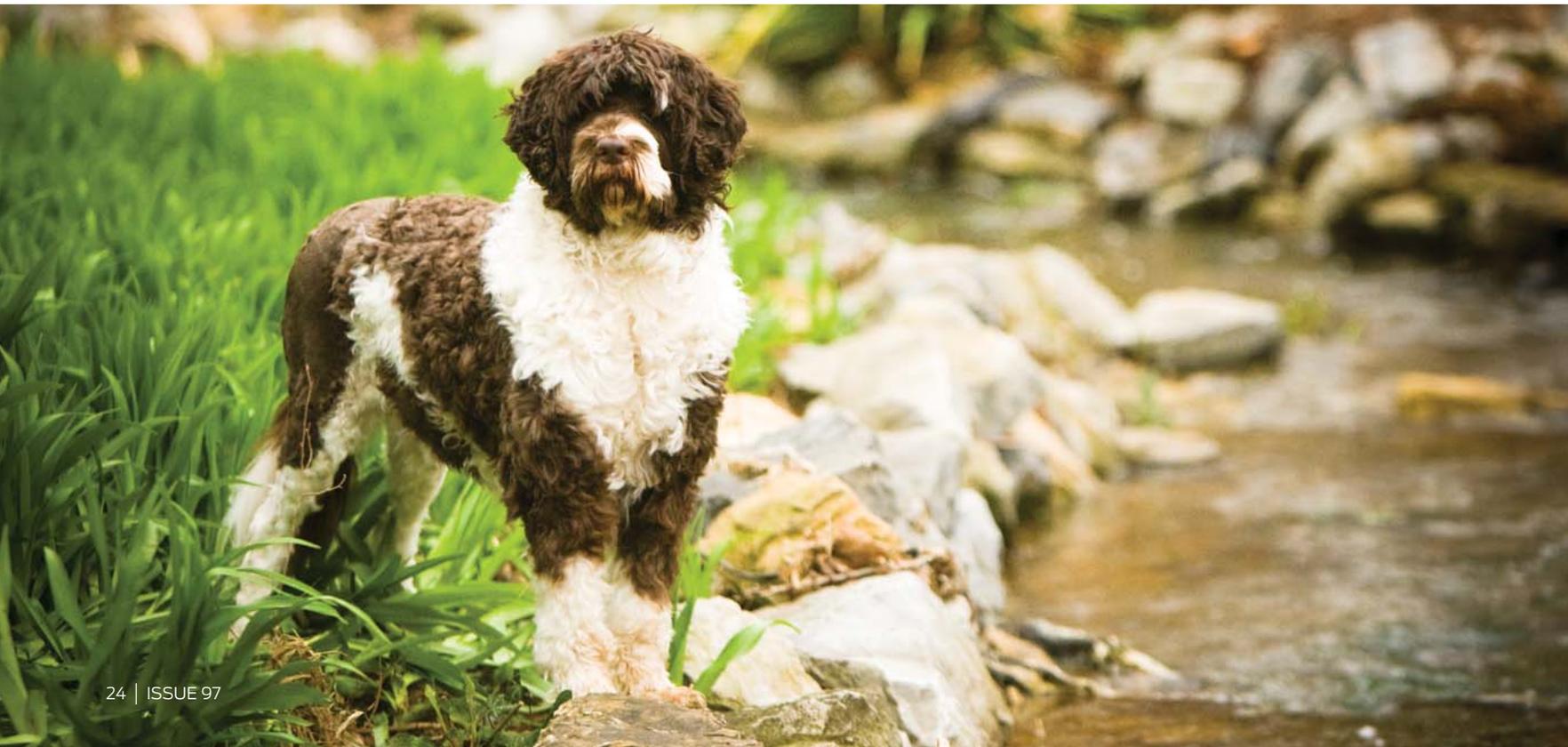
A tricky disease, leptospirosis in some dogs causes no illness, yet other dogs become severely ill or die. Regardless of clinical signs, all infected animals may shed the pathogen in their urine for months or longer. Thus, an infected dog can bring the disease home and infect other dogs that come in contact with their urine. Water bowls, bedding, blankets, and soil can be contaminated

with *Leptospira* and potentially infect other animals, including dogs and people.

Vaccination to protect dogs from four of the eight common strains of *Leptospira* bacteria is offered in a non-core vaccine and as part of core vaccines. Annual revaccination boosters are required. Consult your veterinarian to learn whether an individual dog's lifestyle, including where they live or travel, merit vaccination.

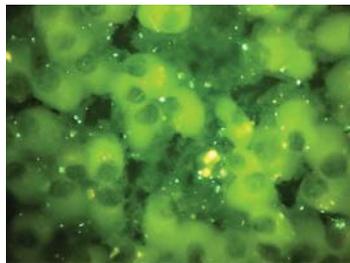
Infected dogs require swift antibiotic treatment, as how quickly a dog improves often depends on how quickly the disease is diagnosed and treated. Those that progress to an advanced stage may require hospitalization, intravenous fluids and careful monitoring.

Leptospirosis has long been recognized by researchers and veterinarians as a "watch-out" disease, though there have been few investigative studies in dogs. The AKC (American Kennel Club) Canine Health Foundation is working to change this by funding two studies that aim to better understand disease prevalence and geographical risk areas and immune response to ultimately lead to an improved vaccine and therapy.



## WHAT IS LEPTOSPIROSIS?

Leptospirosis is a potentially fatal illness transmitted when dogs come in contact with urine from wildlife or rodents infected with the bacteria *Leptospira interrogans*. Warm, wet stagnant environments — lakes, ponds, streams, rivers, and puddles — can harbor the pathogen for many months.



A liver culture shows numerous *Leptospira* bacteria.



A kidney infected with leptospirosis.

IMAGES PROVIDED BY DR. SREEKUMARI RAJEEV, ROSS UNIVERSITY

Infected dogs can have vague signs and be challenging to recognize as having leptospirosis; however, others may show signs of severe kidney or renal disease. Some dogs are chronic asymptomatic carriers, while others are stricken by full-blown disease. Regardless, all infected dogs excrete the bacteria in their urine, contaminating the environment and contributing to the transmission cycle.

**To learn more, go to:** <https://bit.ly/2Lv1XR0>

## TIPS ON DISEASE PREVENTION

- **Vaccinate dogs** that frequent high-risk leptospirosis areas, especially those that spend time in environments where *Leptospira* are often found. The current vaccines protect against four of the eight common bacterial strains, or serovars, causing leptospirosis. Two doses are required for the initial series, then an annual booster revaccination.
- **Be informed** about geographical regions designated high-risk for leptospirosis. Try to reduce the risk of exposure by avoiding slow-moving or standing water and areas with high raccoon, rodent and other wildlife populations.
- **Isolate** a dog suspected of having contracted leptospirosis to prevent risk to other dogs or people and use precautions such as gloves and clothing to protect yourself and help ensure you do not spread the bacteria to other areas. Make sure your veterinarian knows there are other dogs in a kennel or household where a dog has been diagnosed, as they may need treatment as well.
- **Consult your veterinarian** about your dog's lifestyle and sporting activities to help plan for routine vaccination and be prepared to help prevent a fatal outcome.



## RECOGNIZING CLINICAL SIGNS

Often unrecognized, leptospirosis in dogs typically begins as a nondescript infectious illness. Decreased appetite, lethargy and occasional vomiting provide few clues for an accurate diagnosis. Savvy owners whose dogs have been in high-risk leptospirosis areas will share this information with their veterinarian to aid a quicker diagnosis before more severe clinical signs occur.

In some dogs the disease progresses with signs of kidney or liver failure that may include:

- Sudden increase in drinking (polydipsia) or urinating (polyuria)
- Severe weakness, weight loss, and muscle pain and weakness
- Not eating and vomiting
- Jaundice, blood in stool and disorientation
- Difficulty breathing, excessive panting and exercise intolerance

## RESEARCH TO LEARN MORE

Designated a top health concern to dogs by the AKC Canine Health Foundation, leptospirosis is being investigated through two funded research studies. Here are highlights of the studies.

### Estimating Prevalence & Identifying Risk Factors

A map of the U.S. showing positive canine leptospirosis cases from 2009 to 2016 is being developed at The Ohio State University and the University of Prince Edward Island to shed light on “hot spots” of infection. The study team, led by Jason Stull, VMD, PhD, DACVPM, assistant professor, aims to increase awareness about areas of greatest risk. Additionally, his team is studying the behaviors and practices of owners of leptospirosis-infected dogs in order to identify how to successfully reduce the risk of this disease.

**Go to study online:** <https://bit.ly/2J0aESx>



Not Pictured:  
Alaska: 0% prevalence  
Hawaii: 2% prevalence

0% 1% 10%  
Prevalence

Canine leptospirosis prevalence across the U.S. is shown for 2015–2016, based on PCR (polymerase chain reaction) positive test results from IDEXX Laboratories, as developed by Dr. Stull's research team at The Ohio State University. They are expanding the prevalence timeframe from 2009 to 2016 with their current study.

### Understanding Innate Immune Response

Deciphering why some dogs exposed to *Leptospira* bacteria are protected from illness, yet others become severely sick lies in better understanding an individual dog's innate immune response to the pathogen, says Sreekumari Rajeev, BVSc, PhD, DACVIM, DACVP, professor of veterinary bacteriology at Ross University. This study seeks to unravel the factors involved in fatal disease, chronic asymptomatic infection and bacterial clearance by focusing on the role of the dog's innate immune cells, types of white blood cells and the first line of defense against an infection.

**Go to study online:** <https://bit.ly/2sklZXz>