CANINE LEPTOSPIROSIS

Leptospirosis is a bacterial disease of dogs and other mammals that primarily affects the liver or kidneys. There are many species and serovars of *Leptospira:*

- ***Leptospira icterohemorrhagiae*** – mostly associated with exposure to rats, one of the most common serovars
- ***Leptospira pomona*** – mostly associated with livestock
- ***Leptospira grippotyphosa***
- ***Leptospira canicola*** – one of the most common serovars, especially near Mexico
- There are over 250 serovars named but many of them are rare and less important in dogs.

Infections of dogs with *L. icterohemorrhagiae* and *L. canicola* are uncommon in areas where widespread vaccination of dogs has been practiced for many years. Outbreaks of the disease are still seen from time to time. As mentioned above, these may now involve serovars of *Leptospira* that have not traditionally been recognized in dogs, and which are not protected against by the traditional vaccines.

How are dogs infected?

Leptospires live best in warm, slow-moving water such as heavy rains and flooding. After the water clears, they contaminate soil for many months. Wildlife, such as rats and other rodents, are common carriers of the infection. Usually, infection of dogs and humans stems from contaminated environmental water from infected wildlife urine. However, some forms of the bacteria can penetrate damaged or thin skin. For instance, when dogs swim in contaminated water, they may become infected through their skin, usually through a cut in the skin.
The incubation period (from infection to onset of clinical signs) is usually four to twelve days.

What are the signs of leptospirosis?

Many *Leptospira* infections go undetected, but other cases can be life-threatening. Certain strains (serovars) of *Leptospira* are more likely to be associated with disease than other strains, and the *icterohemorrhagiae* serovar is perhaps the most dangerous.

There are three main forms of the disease:

In **hemorrhagic disease**, there is high fever with lethargy and loss of appetite. Multiple small hemorrhages occur in the mouth and on the whites of the eyes. Bloody diarrhea and vomiting may occur. This form is often fatal.

The **icteric or jaundice form** begins much like the hemorrhagic form and many of the clinical signs are the same. It differs in the presence of a yellow color (jaundice or icterus) in the mouth and whites of the eyes. In severe cases, the skin will turn yellow.

The **renal form** causes kidney failure. These dogs are very lethargic, anorectic, and may vomit. Their breath may have a very offensive odor, and ulcers often develop on the tongue. Other signs include diarrhea, excessive drinking (polydipsia) and excessively frequent urination (polyuria). There may be red staining of the urine (blood). The dog may be reluctant to move and show abdominal discomfort. Fever is variable and temperature may actually be subnormal in the more advanced stage.

Younger dogs (less than 1 year old) tend to get the most severe form and generally do not survive. Dogs that survive the acute renal form may be left with chronic kidney disease, chronic liver disease, recurring fevers, uveitis (inflammation in the eye), poor appetite and/or weight loss.

How is leptospirosis diagnosed?

Because the clinical signs are variable and easily confused with other diseases, definite diagnosis can be difficult. There are not readily available rapid and definitive laboratory tests. Taking blood and/or urine samples during infection and again in the recovery period and showing an increase in antibodies to *Leptospira* in the blood serum (at least a four-fold increase in antibody titer) is supportive of the diagnosis with PCR testing.

The test of choice is called the MAT (microscopic agglutination test) test that measures antibody levels, however it can be disadvantageous in that vaccination can interfere and confirmation of a diagnosis includes re-testing in 2-4 weeks which is not ideal in acutely sick dogs. Therefore, in most cases if Leptospirosis is suspected, multiple tests may be recommended.

What is the treatment?

Antibiotics, most commonly doxycycline, are reasonably effective if begun early. Most affected dogs require intensive care in the veterinary hospital. An extended course of antibiotics may be prescribed even in the recovery period to ensure that all the *Leptospira* organisms are cleared, and the dog does not become a chronic carrier. In more severe cases, depending on the extent of kidney/liver damage, prognosis could be guarded.

Unfortunately, it can take up to a week for the organisms to be cleared from the urine though and since Leptospirosis is a zoonotic (contagious to humans) disease, it is important to handle infected dogs with proper personal protective equipment.

Prevention: Vaccination

The vaccination available only covers serovars *Canicola*, *Grippotyphosa*, *Pomona* and *Icterohaemorragiae*. Therefore, most recent outbreaks have been identified as being caused by other serovars, suggesting that vaccination is working. Annual boosters will be needed to maintain the best immunity. The 2022 AAHA vaccination guidelines now include small breed dogs as at risk and highly encourage vaccinating yearly in ALL dogs in the U.S. However, Leptospirosis is still not a core vaccine.

In the past, the leptospirosis vaccine was thought to be associated with a higher chance of immunological vaccine reactions. However, in recent years, the vaccine has been manufactured differently and has made the vaccine less reactive. Other preventative measures to take would be to control rodents in the dog's environment and remove any standing water.

LEPTO IS ZOONOTIC: Leptospirosis can be transmitted to people, so owners of dogs that may have the disease should avoid contact between the owner's bare skin and their dog's urine, and wear rubber gloves when cleaning up any areas the dog may have soiled. Any areas where the dog has urinated should be disinfected. The organism is readily killed by household disinfectants or dilute bleach solution.
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[1]Resources
http://veterinarypartner.vin.com/default.asp?id=19239&id=4951453
https://www.aaha.org/globalassets/02-guidelines/2022-aaha-canine-vaccination-guidelines/resources/2022-aaha-canine-vaccinations-guidelines.pdf
This client information sheet is based on material written by Ernest Ward, DVM.