

## LEPTOSPIROSIS

**Leptospirosis:** Leptospirosis is a spirochete bacterium with a worldwide distribution. There are many serovars documented though only a minority of the identified serovars cause disease. Wildlife act as maintenance hosts, in which there is no clinical disease, and they contaminate stagnant or slow moving water, which is the typical reservoir for dogs. Clinical illness in dogs has been historically caused by serovars *Leptospira icterohemorrhagiae* or *Leptospira canicola*. More recently, *Leptospira grippityphosa*, *Leptospira pomona*, *Leptospira bratislava*, and *Leptospira autumnalis* are more often implicated. The most common presenting complaints include polyuria and polydipsia due to acute (or acute on chronic) renal failure. Hepatic disease and hematological disease (coagulopathy, thrombocytopenia) are also common. The number of cases of leptospirosis generally increases in Ontario in fall and early winter; this seasonality is well documented and is related to rainfall. Leptospirosis is a known zoonosis, but the shedding period of spirochetes in urine is variable and likely related to serovar as well as patient variability. Most leptospirosis infections in people are characterized by clinically silent seroconversion or self-limiting pyrexia



**Diagnosis:** In dogs, Leptospirosis is typically identified via microscopic agglutination test (MAT) titres. There is significant cross reactivity and the serovar of highest antibody magnitude should not be assumed to be the inciting serovar. In addition, treatment with antibiotics may blunt the antibody response and make interpretation difficult; paired (acute and convalescent) leptospirosis titre may be required. This is of particular concern if the dog has been presented rapidly after onset of clinical signs, prior to seroconversion. Detection of deoxyribonucleic acid (DNA) by polymerase chain reaction (PCR) in the urine is commercially available. If performed at a lab with careful testing standards, PCR testing can be considered useful but a negative result is unreliable and MAT titres are recommended for any dog with clinically suspected Leptospirosis infection. Culture is difficult and frequently unrewarding.

**Treatment:** The treatment for acute leptospirosis is antibiotic therapy and supportive care depending on severity of disease. Treatment with high dose penicillin derivatives for rapid elimination of infection is ideally initiated within 5 days of onset of clinical signs. As the leptospires subsequently localize in the proximal renal tubules and are voided in the urine, doxycycline is then administered to eliminate the carrier state. Most cases require hospitalization, with particular attention to fluid/hydration status, electrolyte, blood pressure and hemostasis management. Severe cases may develop marked polyuria requiring high rates of intravenous fluid administration. Oliguric patients can develop life-threatening hyperkalemia. Severely affected patients may develop respiratory disease secondary to toxin-mediated vasculitis, or hemorrhage due to coagulopathy. Options for anuric patients in Ontario are peritoneal dialysis, as hemodialysis is not available at this time.

**Prognosis and outcome:** The prognosis for clinical Leptospirosis is generally good to excellent with treatment, but prolonged hospitalization (7-9 days) can be required. In a recent report of cases treated at Cornell University, 78% of dogs survived to discharge. Survival rate was lower for dogs with *L. pomona*, potentially suggesting that this serovar may cause more severe clinical disease. However, this is a single report and therefore this has not been confirmed with larger studies. In contrast, dogs are the maintenance host of *L. canicola* and disease is usually mild. Chronically, chronic active hepatitis may develop in dogs with previous Leptospirosis infection (especially *L. grippityphosa*).

**Vaccination:** Leptospirosis vaccination has become more common, but there are only 4 serovars present in the vaccine (*L. canicola*, *L. icterohemorrhagiae*, *L. grippityphosa*, and *L. pomona*), and there is little or no cross-reactivity between serovars. Clinical illness is possible even if a patient has been previously vaccinated. In vaccinated patients with a consistent clinical presentation, paired titre evaluation is typically required, as "weak" positive values may be present at presentation.

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