



# Animal Sounds

## Mobile Veterinary Ultrasound

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## **LEPTOSPIROSIS**

**Description:** **Leptospirosis** is a spirochete bacterial disease that is caused by pathogenic strains of the *Leptospira* genus. It is both a significant cause of disease in companion animals and a zoonotic risk. Infection is maintained in wild mammalian reservoir species, and spread via infected urine that comes into contact with intact mucosal surfaces or damaged epithelial surfaces. Environmental factors such as warm, slow or stagnant water, or wet soil encourage survival of this organism.

**Clinical Signs:** Signs of active **leptospirosis** can be vague, and are **most commonly related to renal and hepatic dysfunction**. Signs may include lethargy, fever, anorexia, vomiting, abdominal pain, polyuria/polydipsia, as well as generalized signs attributable to vasculitis. Renal failure can be secondary not only to bacterial penetration into renal tubules, but also through vasculitis secondary to immune response to the organism and cytotoxic compounds produced by the bacteria itself. Note that polyuria and polydipsia can be seen without azotemia in some cases.

**Diagnostics:** **Hepatic abnormalities** typically include elevations in bilirubin, alkaline phosphatase and ALT to a lesser extent. Histopathology may be insignificant in the face of severe icterus in some patients. It is thought that cholestasis in these animals may be related to a septic state and not cellular damage within the liver. Chronic infection may also lead to signs of hepatic failure. **Other signs can be attributed to this organism's ability to create widespread vasculitis**. These may manifest as muscle or joint pain, weakness (including polyarthropathy), disorders of hemostasis, dyspnea associated with pulmonary hemorrhage or thromboembolic disease, and uveitis. **Blood count and chemistry abnormalities can vary as well depending on the severity of disease present**. Typically, a leukocytosis and thrombocytopenia are present, along with varying degrees of azotemia, hyperbilirubinemia and hepatic enzyme elevations. Low urine specific gravity with concurrent proteinuria and glucosuria may also be seen. Anemia, elevations in amylase or lipase, and electrolyte abnormalities may also be noted.

With respect to specific diagnosis, MAT (Microscopic agglutination test) titers are readily available and have become the mainstay of diagnostic testing. Guidelines for determining a positive result would be based on titers  $\geq 1:800$  for an unvaccinated dog, and  $\geq 1:3200$  for a previously vaccinated animal. **Several problems exist in evaluation of leptospira titers**. Possibly of biggest concern is the fact that initial titers can be negative despite clear signs of clinical disease. These false negative results can lead to improper therapeutics for the patient and an increased risk of zoonotic spread. In cases where leptospirosis is suspected, the titer should be reevaluated in 10-14 days (longer convalescent titers may be negative or low positive if the patient has been treated in the interim.) False negatives can also occur if the correct serovar is not tested for. Some of these may be low positive on standard titers due to some cross-reactivity between the antibodies to different leptospira species, and therefore patients displaying

this low positive result could still be actively infected. **Serologic testing does not differentiate a natural infection from a vaccinated patient**, and therefore if clinical suspicion of disease exists, evaluation of the initial magnitude of the titer and rising convalescent titers may be helpful. **Thoracic radiographs** may reveal patchy pulmonary opacities consistent with pulmonary hemorrhage or thromboembolic disease. **Ultrasonographic findings** may include hepatomegaly, renomegaly, hyperechoic renal cortical tissue and presence of corticomedullary rims, pyelectasia or presence of peri-renal fluid. These changes are not pathognomonic for leptospirosis, and are seen in other disorders causing vasculitis. Absence of radiologic or ultrasonographic change does NOT indicate absence of infection as the hepatic and renal sonogram can also be normal (Seiler).

**Treatment:** Intravenous ampicillin in a hospital setting is the most effective treatment acutely, while doxycycline is effective against the carrier state. Therefore, combination therapy is recommended over a 4-6 week period.

**Conclusion:** *Leptospira* continues to be a diagnostic challenge, and recent reports suggest that it has been formerly underdiagnosed. This disease is found worldwide, and should be considered in animals displaying any of the above-mentioned signs, regardless of vaccination and travel history.

#### **References:**

Ward MP, Glickman LT, Guptill L. Prevalence of and risk factors for leptospirosis among dogs in the United States and Canada: 677 cases (1970-1998). JAVMA. 2002;220:53-58.

Adin CA, Cowgill LD. Treatment and outcome of dogs with leptospirosis: 36 cases (1990-1998). JAVMA. 2000;216:371-375.

Stokes JE, Kaneene JB, Schall WD, et al. Prevalence of serum antibodies against six *Leptospira* serovars in healthy dogs. JAVMA. 2007;230:1657-1664.

Moore GE, Guptill LF, Glickman NW, Caldanaro RJ, Aucoin D, Glickman LT. Canine leptospirosis, United States, 2002-2004. Emerg Infect Dis. 2006;12:501-503.

Sessions JK, Greene CE. Canine leptospirosis: Epidemiology, pathogenesis, and diagnosis. Compend Contin Educ Pract Vet. 2004;26:606-623.

Langston CE, Heuter KJ. Leptospirosis--A re-emerging zoonotic disease. Vet Clin North Am Small Anim Pract. 2003;33:791-807.

Wohl JS. Canine leptospirosis. Compend Contin Educ Pract Vet. 1996;18:1215-1225.

Forrest L, O'Brien R, Tremelling M, et al. Sonographic Renal Findings in 20 Dogs with Leptospirosis. Veterinary Radiology & Ultrasound Vol 39, No 4, 1998, pp. 337-340.

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