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## Leptospirosis in Dogs

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Leptospirosis is an important infectious disease of dogs. In the Midwest, Leptospirosis is usually diagnosed in the late summer to fall time period especially if there is a sustained period of above normal precipitation 1–3 months earlier. It is important to remember that all breeds and life styles (city vs. rural) dogs are at risk of contracting Leptospirosis, but adult male dogs that spend a considerable amount of time outdoors are at greatest risk.

Confirmation of a suspected case of Leptospirosis requires laboratory testing. Practitioners should submit both urine and serum from acutely-ill dogs. Approximately 5–10 ml of urine and 1 ml of serum sent chilled to the laboratory is a sufficient volume for testing. Please request the Polymerase Chain Reaction test (Lepto. Real Time PCR) for the urine sample and the Microscopic Agglutination Test (MAT) for the serum sample. The Lepto PCR test detects the *Leptospira* bacterium directly from the urine sample. The assay only detects pathogenic *Leptospira* (does not react with saprophytic spirochetes) but it cannot say which pathogenic serovar is causing disease. The cost of the PCR urine test can be found on the WVDL website (<https://custportal.wvdl.wisc.edu/testFeeList.jsp>). Urine samples must be collected before antimicrobial treatment is initiated because antibiotics will rapidly decrease the number of organisms below the detection limit of the assay. Ideally, urine collected during mid-stream on a voided sample provide the best diagnostic results.

The following six serovars are used in the canine (small animal) MAT at the WVDL: *bratislava*, *canicola*, *grippityphosa*, *autumnalis*, *icterohaemorrhagiae* and *pomona*. The cost of the canine (small animal) MAT (test code: LEPTO-K9) can be found on the test and fees section of the WVDL website (address listed above). *Autumnalis* was added because some dogs that are sick from acute Leptospirosis will have a positive MAT titer to *autumnalis* but test negative to the six serovars used in the standard MAT.<sup>1</sup> It's unlikely the *autumnalis* serovar is causing clinical disease in these dogs. A positive antibody titer to *autumnalis* reactivity represents a “paradoxical” cross-reactivity between itself and other serovars such as *Pomona*.

Generally, the serovar with the highest titer is the infecting serovar but cross-reactions do occur albeit at a lower level. Titers should be interpreted in the context of clinical findings, laboratory data and the Leptospirosis vaccination history. Dogs suffering from acute Leptospirosis may have very low (non-diagnostic titers) at the time of presentation. If this occurs, a convalescent

sample should be collected at least 7–10 days later for paired serology. The WVDL retains serum samples for 30 days and can match up the original acute sample with the convalescent sample for paired serology. The following is a list of guidelines for interpretation in dogs.

### **MAT Titer Interpretation**

$\leq 1:400$	→	Negative
1:800	→	Suspicious
$\geq 1:1600$	→	Positive

The MAT cannot distinguish between antibodies produced by vaccination and those produced from exposure to the bacterium. Vaccine titers are seldom higher than 1:800 and often decline to 1:200 or less within 90 to 120 days after vaccination. Typically, vaccinated animals have significant titer elevation only to the serovars found in the vaccine. Animals suffering from Leptospirosis usually have one serovar that is at least 4-fold higher than all the other serovars tested.

#### Reference:

<sup>1</sup>Prescott JF, McEwen B, Taylor J, Woods JP, Abrams-Ogg A, Wilcock B. 2002. Resurgence of Leptospirosis in Ontario: recent findings. *Can Vet J* 43:955-961.