

TECHNICAL BULLETIN

Leptospirosis Update

LEPTOSPIROSIS STATISTICS IN THE NORTHWEST January 2017 through December 2017

This report summarizes leptospirosis titer testing submitted through Phoenix Lab using the microscopic agglutination test (MAT) at the Washington Animal Disease Diagnostic Laboratory (WADDL) at Washington State University. We also report on the result of *Leptospira* PCR (polymerase chain reaction) testing on urine through the Veterinary Medical Diagnostic Laboratory at Texas A&M. No samples for *Leptospira* PCR testing on blood were submitted to Phoenix in 2017.

A total of 164 samples were submitted for leptospirosis titers – from 142 dogs, five horses, one goat, and one cat. Fifteen paired samples were submitted and thus there were 149 animals for which individual samples were submitted for testing.

There were six samples consistent with current exposure to leptospirosis, all based on the results of a single titer. In one of the dogs, the titer continued to rise on a convalescent titer supporting a second positive serovar. One case was a horse, the remaining five were dogs. One of the dogs was a five month old small breed dog, the others were middle to slightly older medium to large breed dogs. History of illness and vaccination status were unknown in the animals.

The puppy had a high titer to *L. bratislava* and a rising titer to *L. icterohemorrhagica*, two dogs has the highest titer to *L. pomona*, one dog had the highest titer to *L. bratislava*, and the other dog had equally high titers to *L. autumnalis* and *L. pomona*. The horse had equally high titers to *L. bratislava* and *L. pomona*.

The puppy was tested in March, the horse and one dog in May, and one dog in the months of June, October and November. The clinics of record for the dogs with titers consistent with current exposure were located in Seattle and Bellevue (two dogs each), and one dog was seen in Ethel. The horse was seen at a clinic in Wenatchee.

For comparison, 161 to 189 animals/year were tested for leptospirosis from 2012 through 2016. The number of animals having MAT titers consistent with current exposure was 17 in both 2012 and 2013, 29 in 2014, 20 in 2015 and 19 in 2016.

Nineteen samples were submitted for *Leptospira* PCR testing on urine. All were on serum, two were also done on urine. Fifteen of these patients also had testing for leptospirosis serology. All *Leptospira* PCR testing was negative. Serology done on those patients also did not support concurrent exposure to leptospirosis.

Testing for Leptospirosis

At Phoenix Lab, we offer send-out tests for serology and PCR (blood and urine).

Serology:

Although a single positive MAT titer greater than or equal to 1:800 may increase suspicion for clinical leptospirosis, current recommendations for diagnosis of leptospirosis are measurement of acute and convalescent samples (7-14 days apart) demonstrating a 4-fold or greater rise in titer. Single titers can also be negative early in the course of disease. The determination of a rising titer by MAT helps prevent over interpretation of high single titers due to recent vaccination or cross-reactivity between serovars. Failure to isolate *L. autumnalis* on culture from dogs in the US or Canada suggests that positive titers to this serovar may reflect cross-reactivity.

The variation in positive results and paucity of acute and convalescent titers makes it challenging to identify infecting serovars. Studies have shown that the serovar with the highest titer can vary over time. Paradoxical cross-reactivity to multiple serovars can occur after exposure to a single serovar. Rather than trying to predict which serovar is involved, results of MAT serology is best used in conjunction with history, clinical signs, and supporting laboratory testing, to diagnose clinical leptospirosis and begin appropriate treatment.

PCR Testing:

Polymerase chain reaction (PCR) testing for leptospiral DNA can also be performed on urine and serum. The sensitivity and specificity of PCR assays may vary with the laboratory and shedding patterns of various serovars present in geographic areas. PCR assays are best performed on blood and urine concurrently because urine shedding begins roughly 10 days after onset of infection. PCR testing may be positive before serology. A negative PCR result does not rule-out leptospirosis.

There is also a newly developed rapid point of care test. Dark-field microscopy is not routinely performed. Bacterial culture for leptospirosis in blood or urine is the most definitive technique to identify infective *Leptospira spp.* but culture is difficult and must be incubated for several weeks.

Leptospirosis is a reportable disease to the Washington State Department of Health. Diagnostic laboratories and attending veterinarians are required to report results consistent with current exposure.

<http://www.doh.wa.gov/Portals/1/Documents/Pubs/333-158.pdf>