

Leptospira Testing Options

UTCVM BACTERIOLOGY & MYCOLOGY LABORATORY

How do I choose a diagnostic test?

Careful selection of diagnostic tests is necessary to interpret the true nature of infection involving clinical disease vs. reservoir status. Leptospirosis can be manifested as biphasic infection. The sample and test selection can be based on the figure shown at the bottom of this page. This diagram provides a reasonable representation of what happens in a canine patient with clinical leptospirosis. Review the table on the next page to see details and comments for each available test. To see the most current pricing for all available tests, visit vetmed.tennessee.edu/vmc/dls

Which samples should I collect, and how do I submit them?

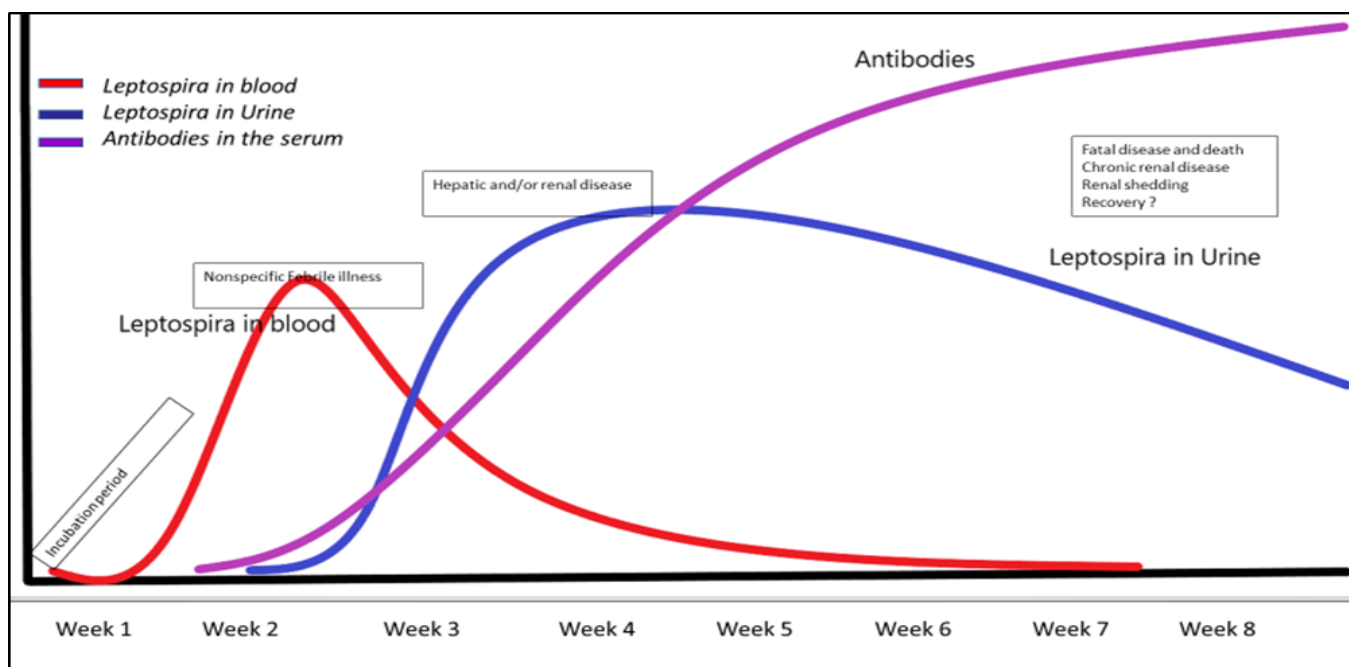
An ideal sample/test choice will be a blood (purple/green/yellow top) AND urine sample for PCR, and serum or plasma sample for microscopic agglutination test. The agent and antibody detection together using multiple samples/tests will increase the confidence in test results and interpretation. Samples should be stored and transported overnight under refrigeration conditions. **A minimum volume of 0.5 ml of blood and 1ml of urine for PCR, and, 0.5ml of serum for MAT is required. A 2-5 ml of sample volume is ideal. Please submit 0.5-2 inch pieces of tissue for PCR or Immunofluorescence.**

How do I interpret the test results?

A positive blood PCR test indicates that there is leptospiremia, and in a clinically symptomatic patient, this is compatible with the diagnosis of clinical leptospirosis. A positive urine PCR test confirms renal colonization observed in clinical disease and animals with asymptomatic renal colonization. A positive microscopic agglutination test (MAT) titer indicates the presence of agglutinating antibodies to *Leptospira* serovars tested in the MAT panel. A positive MAT test suggests that the patient serum contains antibodies to the positive serovar. Antibodies can be a result of vaccination or previous exposure. A serum titer above 800 with compatible clinical signs in an unvaccinated animal is suggestive of active infection. The test detects only antibodies and thus does not confirm active infection. The test is useful when performed using paired serum samples, and the titers can be carefully interpreted utilizing other clinical data and history.

How can I test livestock/equine or other species?

In addition to fatal disease, abortion and reproductive failures can be a manifestation of *Leptospira* infection in livestock. To investigate *Leptospira*-related abortion, submit stomach fluid, fetal tissue (liver, kidney, and spleen), and placenta for PCR. A paired serum sample taken 2-4 weeks apart from the dam can be submitted for serology.



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In cattle herds with reproductive failures, perform a herd level screening of 15-30 animals per herd. Submit 5-20 ml of midstream urine preferably collected after administering a diuretic (Lasix) and corresponding serum samples. PCR and Immunofluorescence tests are available. Please call for a price break if you are interested in herd screening.

In cases of equine patients with equine recurrent uveitis, submit serum and aqueous humor for MAT testing. Aqueous and vitreous humor can also be tested using PCR.

Do you test wild animal species for *Leptospira* infection?

Leptospira surveillance and epidemiology are a part of our research. Please call if you are interested in pursuing wild animal studies.

Does your laboratory culture *Leptospira*?

We have protocols in place for *Leptospira* culture and frequently perform them in our epidemiology studies. Please call for more information.

What are serovars included in your MAT Panel?

Our laboratory has an active *Leptospira* research program involving epidemiology, microbiology diagnostic, and vaccine development. We offer serology for an extended panel of 12 *Leptospira* serovars. For research, a 22 serovar panel MAT is available.

List of Serovars

- Autumnalis
- Ballum
- Bataviae
- Bratislava
- Canicola
- Copenhageni
- Grippotyphosa
- Hardjo
- Icterohemorrhagiae
- Mankarso
- Pomona
- Tarassovi

TEST NAME	TEST DESCRIPTION	SAMPLE SUBMISSION	COMMENTS
LEPTOSPIRA PANEL (PCR ONLY)	<ul style="list-style-type: none"> <i>Lip L32</i> gene-based Real-Time PCR to detect DNA from pathogenic <i>Leptospira</i> 	0.5 mL Blood and 1 mL urine	Detects <i>Leptospira</i> DNA in clinical samples with high sensitivity and specificity
LEPTOSPIRA PANEL (Serology & PCR)	<ul style="list-style-type: none"> <i>Lip L32</i> gene-based Real-Time PCR to detect DNA from pathogenic <i>Leptospira</i> Microscopic agglutination test (MAT) to detect agglutinating antibodies to selected <i>Leptospira</i> serovars 	0.5 mL Blood and 1 mL urine for PCR PLUS 1 - 2 mL serum or plasma for Serology	The BEST choice for Diagnosis of clinical leptospirosis
LEPTOSPIRA PCR	<ul style="list-style-type: none"> <i>Lip L32</i> gene-based Real-Time PCR to detect DNA from pathogenic <i>Leptospira</i> 	0.5 mL Blood, 1 mL urine, or 1-2 inch necropsy sample from liver and kidney tissue	Detects <i>Leptospira</i> DNA in clinical samples with high sensitivity and specificity
LEPTOSPIRA SEROLOGY	<ul style="list-style-type: none"> This test detects agglutinating antibodies to <i>Leptospira</i> serovars used in this panel. Interpretation of results varies depending on various clinical scenarios 	1 - 2 mL serum or plasma	Performed only once weekly
Other tests available but not preferred due to their lower sensitivity and specificity			
LEPTOSPIRA Direct Immunofluorescence	<ul style="list-style-type: none"> Will perform fluorescent antibody test using polyclonal antibodies Sensitivity - Moderate Specificity - Moderate 	0.5 mL Blood, 1 mL urine, or 1-2 inch necropsy sample from liver and kidney tissue	This test is suitable for cattle herd screening
Darkfield Microscopy (DFM) <i>* Only available to UTCVM patients suspected of clinical leptospirosis. Sample should reach the lab within 1 hour of collection.</i>	<ul style="list-style-type: none"> This test is used for the presumptive identification using the morphologic features using a darkfield microscope. Results within one hour of submission Sensitivity - Low Specificity - Low 	0.5 mL Blood or 1 mL urine	Results are available within 1 hour after receipt in the lab

For PCR testing, same day service if submitted before 10 AM on weekdays. MAT is performed once a week on Wednesday or Thursday.

Contact Dr. Sree Rajeev (srajeev@utk.edu) to further discuss *Leptospira* infection.