

What is leptospirosis?

- *Leptospira* spp. are mobile bacteria that can infect many mammalian species, including humans. Leptospirosis is considered a zoonotic disease.
- Subclinically infected wild and domestic animals, including cats, are reservoir hosts and a potential source of infection.
- Cats rarely develop clinical signs, but they can be infected with *Leptospira* spp. and shed *Leptospira* spp. in their urine, and thus serve as a source of infection.

Infection

- There are over 250 pathogenic serovars in different wild or domestic animal reservoir hosts.
- *Leptospira* spp. are found in the environment, particularly in contaminated water, where they can remain infectious for several months.
- In cats, infection with many different serovars has been detected, by antibody detection, PCR from blood and urine, and urine culture. Serovars in cats are essentially the same as those found in dogs.
- Shedding of viable *Leptospira* spp. has been detected in cats worldwide.
- Transmission of *Leptospira* spp. occurs by direct or indirect contact.
 - Cats mostly become infected through feeding on natural reservoir hosts, such as through hunting rodents. Cats can also be exposed to urine of cohabitating dogs and livestock, e. g. cattle and pigs.
 - Transmission through water contact is less likely in cats.
- After penetration of mucous membranes or skin, *Leptospira* spp. multiply rapidly upon entering the blood vascular space. They can invade many organs, especially the kidney, in which *Leptospira* spp. can persist and cause shedding for months to years.

Clinical signs

- Experimental infection of cats results in leptospiraemia and leptospiruria, but causes only mild clinical signs despite histologic evidence of renal and hepatic inflammation.

- Clinical signs rarely occur in naturally infected cats although there are recent studies in which clinical signs have been described more commonly.
- Recent studies have demonstrated a potential association between feline chronic kidney disease and *Leptospira* spp. infection, but their pathogenic importance in cats needs further investigation.

Diagnosis

- Testing for *Leptospira* spp. infection is recommended in cats with suspicious clinical signs and potentially in healthy cats belonging to immunosuppressed owners or humans diagnosed with leptospirosis.
- For direct identification of *Leptospira* spp., PCR can be used.
 - PCR can detect *Leptospira* spp. DNA in blood, urine, or tissue samples and positive PCR results confirm infection.
 - Negative PCR results do not rule out infection due to intermittent bacteraemia and urine shedding. Additionally, if a cat has received antibiotics before PCR testing, it is known that PCR can yield negative results within hours.
- Of the antibody tests, the microscopic agglutination test (MAT) is the test of choice.
 - However, correct assessment of MAT results is difficult due to inter-laboratory variation and differences in host-specific immunity. Cross-reactivity makes identification of the infecting serovar impossible.
 - As no feline leptospirosis vaccines are available, MAT results are more meaningful in cats than in dogs, as in dogs, vaccination can induce positive MAT results.
 - A definitive diagnosis of infection can be based on rising MAT titres (a 4-fold increase corresponding to 2 titre steps) 7-14 days apart.

Disease management

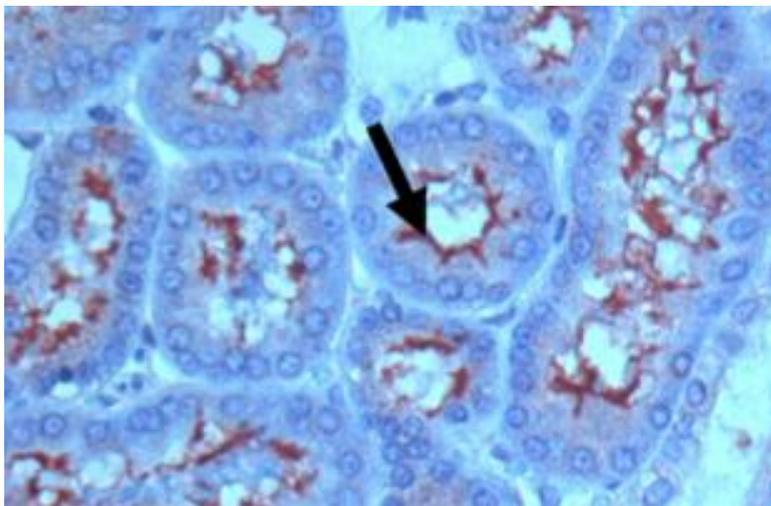
- In healthy cats that shed *Leptospira* spp., treatment with doxycycline (5 mg/kg q 12h PO for 3 weeks) should be initiated to eliminate the carrier state.
- As in dogs, treatment of ill cats consists of antibiotics and supportive therapy, depending on the severity of clinical signs.

Prevention

- No vaccine is available for cats.
- The only way to prevent infection of cats is to avoid them feeding on potentially infected rodents and getting in contact with potentially contaminated water.
- Cats that are kept indoors only have a very low risk of being infected.

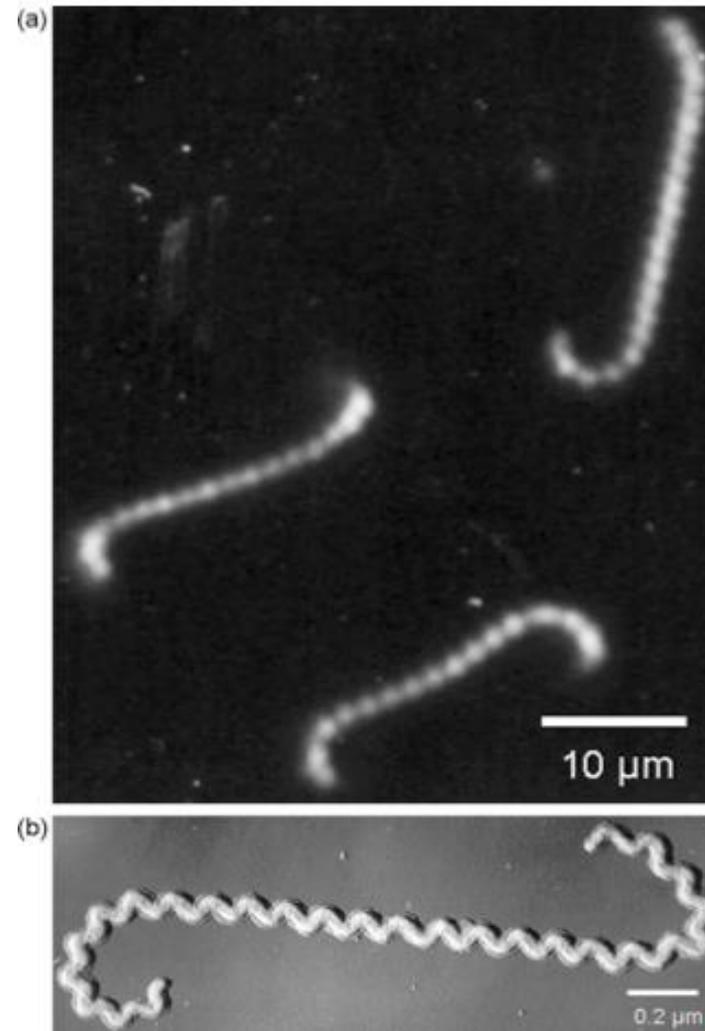
Zoonotic aspects

- Up to 10 % of outdoor cats can shed *Leptospira* spp., which might pose a risk to veterinarians and owners, especially if rodent-hunting outdoor cats also use indoor litter boxes. Litter boxes of outdoor cats should generally be cleaned wearing gloves.
- It was, however, demonstrated that cat owners have a reduced risk of getting infected in endemic areas, likely because cats will reduce the number of potentially infected rodents in the close environment.



- Immunohistology staining of leptospires in the kidneys of an infected hamster. Leptospires stained with specific antiserum (arrow) are seen lining the proximal renal tubules.

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- Dark field photomicrograph (a) and shadowed electron micrograph (b) of *Leptospira* spp.

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