



# THE WINN FELINE FOUNDATION

For the Health and Well-Being of All Cats

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## Cats and Toxoplasmosis

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Toxoplasmosis is caused by the microscopic parasite, *Toxoplasma gondii*. This parasite can infect almost all mammals including humans, but domestic cats and their wild relatives are the definitive hosts (i.e. the parasite requires a cat to complete its life cycle). There are three main ways the parasite is transmitted to people and animals:

- Infection of a fetus during pregnancy
- Eating an infected tissue source (such as raw or undercooked meat)
- Ingestion of oocyst-contaminated food or water

Only domestic and wild cats shed the infective form of the parasite - the oocyst - in their feces. These oocysts can contaminate the environment as they are resistant to freezing and drying and most disinfectants. Once shed by the cat, they require from 24 hours to a few days to become infectious. When another mammal, such as a mouse, ingests the infectious oocysts, it then becomes infected with *Toxoplasma*. If the mouse survives the infection, it may become a source of infection for any animal that eats it. Cats usually become infected by ingesting the infectious oocysts or by eating prey or raw meat containing the parasite. Kittens may also be infected in utero if the queen acquires the parasite while pregnant.

The parasite initially infects the cells of the cat's intestinal tract and the associated lymph tissue. It can then spread to other organs via the blood or lymph system. Once infected, cats begin to shed oocysts in their feces a few days to a few weeks later. However, oocysts are shed for only one to three weeks after the initial exposure, so most cats are not shedding at the time they have signs of illness. Shedding is heaviest when kittens aged 6 to 14 weeks old are infected.

Disease is most severe in those kittens infected before birth. These kittens can be stillborn or may fail to thrive and die before weaning. Affected kittens may have inflammation of the lungs, liver, and central nervous system. Fluid can accumulate in the abdomen. Cats infected after birth may have clinical signs that include loss of appetite, lethargy, and trouble breathing due to pneumonia. Other clinical signs can include fever, weight loss, jaundice, vomiting, diarrhea, stiff gait, shifting leg lameness and neurologic problems. Inflammation of the retina in the eye can also occur.

The majority of animals and people infected with *Toxoplasma* do not become ill. Why this is so is not fully understood, but factors such as stress, concurrent illness and immunosuppression play a role. In cats, clinical toxoplasmosis has been seen in association with *Mycoplasma haemofelis* (formerly called *Hemobartonella felis*), feline

leukemia virus infection (FeLV), feline immunodeficiency virus infection (FIV), and feline infectious peritonitis (FIP). Long-term immunity is not 100%, so that cats can be re-infected with *Toxoplasma* in the future and shed oocysts again but the amount of shedding in future episodes is relatively insignificant.

Diagnosis of toxoplasmosis in cats is challenging and may involve x-rays, fecal examinations, blood tests and other diagnostic methods. Antibody titer tests for the IgG class of antibodies are available, but interpretation of a single sample can be difficult. A cat that has had toxoplasmosis in the past and has recovered from the infection and is now immune will have a positive IgG titer. A cat with an active infection will also have a positive titer. As well, false positive titers for *Toxoplasma* antibodies can occur after any routine vaccination and this effect can persist for up to 10 months after the vaccine was given.

Using paired blood samples to monitor antibody titers can be more helpful. Active toxoplasmosis can be documented if the IgG antibody titer increases four-fold over a two to three week period. Another antibody test, for the IgM class of antibody, is a more reliable indicator of active infection. In most cases, a blood test is done for both IgG and IgM antibodies at the same time. Fecal examinations for oocysts are usually unrewarding since they are shed for only a short period of time. Despite the wide distribution of this parasite throughout the world, it has been estimated that on any given day, less than 1% of the cats in the United States are shedding oocysts.

Treatment of cats ill with toxoplasmosis can be difficult. Little is known about the efficacy of most drugs against this parasite. The most effective drug is clindamycin and it must be given for two to three weeks. Good hygiene must be practiced by any people handling and treating a cat ill with toxoplasmosis to avoid human infection. The importance of toxoplasmosis lies mainly in the seriousness of human infections. People are infected in many of the same ways as cats and infection is probably more widespread than we know. Simple contact with a cat is not a risk for transmission of the disease. Healthy adults rarely become ill with toxoplasmosis. Signs of a new infection may be transient swollen lymph glands and flu-like symptoms. However, adults who are immunosuppressed, either with acquired immunodeficiency syndrome (AIDS), cancer or from taking certain medications, may become very ill with toxoplasmosis.

Toxoplasmosis is one of the most common human infections in the world. Infection is most common in warm climates and lower altitudes. In the United States, it is estimated that about 60 million people carry *Toxoplasma* antibodies in their bloodstream. However, very few people have symptoms of illness. But up to one in every 1,000 babies born in the United States is infected with *Toxoplasma*. This is where the parasite exerts its most devastating effects. When a pregnant woman acquires a toxoplasmosis infection for the first time, the infection can be severely damaging to her fetus. The effects depend on when during pregnancy the infection occurs. The most severe effects are felt during the second or third trimesters of pregnancy. Some of these infants are afflicted with fatal central nervous system lesions. In some cases, infants appear normal at birth, but evidence of disease appears years later. Children infected with *Toxoplasma* after birth can also suffer serious effects, especially in the eyes and brain.

However, you do not have to give up your cat to avoid toxoplasmosis. Even pregnant women can avoid toxoplasmosis without giving up a pet cat. Prevention is a matter of common sense precautions. Here are some simple steps that can be taken to minimize the risk of infection for both cats and owners:

1. Scoop the litter box daily since a 24-hour period is necessary after the oocysts have been shed in the feces for them to become infective.
2. Pregnant woman should avoid cleaning litter boxes.
3. Pregnant women should avoid contact with garden soil, sandboxes, and raw meat.
4. Cats should be prevented from defecating in play areas, sand boxes, and gardens.
5. Do not put used cat litter or fecal material in compost piles or on gardens.
6. Raw or undercooked meat should not be fed to cats or consumed by humans. Meat (especially pork, lamb and venison) should be cooked to an internal temperature of 160°F (70°C). Other possible sources of infection to avoid are raw goat's milk, raw eggs and untreated drinking water.
7. Prevent cats from hunting.
8. Wash hands, surfaces and utensils well with soap and water after handling raw meat.
9. Wear gloves when gardening to avoid contacting oocysts in the soil and wash any fruits and vegetables well before eating.
10. Women planning a pregnancy should consult a physician about prenatal blood testing to see if they have already contracted the infection and are therefore likely to be immune.

**For further information:**

Healthy Pets, Healthy People (Centers for Disease Control)  
<http://www.cdc.gov/healthypets/diseases/toxopasmosis.htm>

American Association of Feline Practitioners Zoonosis Guidelines:  
<http://www.aafponline.org/resources/guidelines/ZooFinal2003.pdf>

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