

What is Toxoplasmosis?

Toxoplasmosis is one of the most important feline associated zoonoses but is also one of the most misunderstood. Approximately one third of the human and cat populations are infected with the organism, yet it is rare for people to acquire it directly from a cat. Indeed, studies have shown no correlation between cat ownership and increased risk of toxoplasmosis.

Understanding toxoplasmosis

An appreciation of the life cycle of the causative organism, *Toxoplasma gondii*, is essential to an understanding of toxoplasmosis and the way in which it infects humans. Cats are the definitive host for *T.gondii*, meaning that the organism must infect a cat to complete its life cycle. Cats are usually infected by eating infected prey such as rodents or birds. In a cat that has not previously been infected by the organism, *T.gondii* undergoes sexual reproduction in the cat's intestine. This results in millions or billions of oocysts (or eggs) being excreted in the cat's feces for a single brief period of 1-3 weeks, typically 7-10 days. Once a cat has been infected, it will not excrete the oocysts again, so usually those that excrete *T.gondii* are young cats. Importantly, the excreted oocysts are not able to infect other animals or humans until they have sporulated, a process that takes a minimum of 24 hours, and sometimes up to 5 days. In damp conditions, the survival of sporulated oocysts in the environment is inversely proportional to the ambient temperature: at 39°F they may remain viable for up to 2.5 years, while at 95°F they can only survive one to two months. These oocysts contaminate soil or water where the cat has defecated, including gardens, plots in which vegetables are grown, and children's sandpits.

What are the symptoms?

When a human or other animal eats food that has been contaminated by sporulated oocysts they may become infected by the organism, which replicates and invades their body. This process is accompanied by either no symptoms at all or a very mild, transient fever and malaise. Most people never know that they have been infected. If the host animal or human has a competent immune system, the organism will be walled off in tissue cysts, where it usually lies dormant causing no illness for the rest of the host's life. However, when an uninfected animal or human ingests meat that contains these cysts, they may become infected with the organism. The tissue cysts can be destroyed, and hence meat rendered safe to eat, by cooking it at 160°F.

People at risk

There are two categories of people who are at risk from toxoplasmosis: those without a competent immune system, and unborn fetuses. If a person is receiving immune-suppressive drugs or is an AIDS patient, the organism may escape from the patient's tissue cysts and cause severe illness, including inflammation of the brain, nervous system, heart, liver and eyes. If a woman that is already infected with toxoplasma falls pregnant, there is no risk to the unborn fetus. However, if a woman who has not been infected by toxoplasma becomes infected with the organism during pregnancy, there is a risk that *T.gondii* may cross the placenta and infect the fetus, with the potential to cause stillbirth, neurological and ocular disease.

What should we do?

So what do we need to do about it? Firstly, it is important to remember that this is a ubiquitous organism. Based on the average infection rates in humans, there is a 1 in 3 chance that you are already infected by *Toxoplasma gondii*, and likely will not suffer any adverse health consequences arising from it. However, there are some simple precautions that can be taken to prevent infection with toxoplasma, and these guidelines should be strictly followed by pregnant women and immunocompromised individuals. Make sure all meat is cooked thoroughly to 160°F, or medium-well done. This will kill any *T.gondii* cysts that it might contain. Thoroughly wash and/or peel all vegetables to remove any sporulated oocysts that may have come from the soil in which they were grown. Wear rubber gloves when gardening for the same reason. Cover children's sandboxes when not attended to prevent cats defecating in them. As cats are usually infected with toxoplasma by eating infected prey or under-cooked meat, prevent them from hunting or eating raw meat. It is very rare for an indoor cat fed only commercial cat food to become infected with toxoplasma. Feral or stray cats are a more significant origin of oocysts than pet cats. As oocysts are not able to infect humans for at least 24 hours after excretion by the cat, ensure all feces are removed daily. Consider using a disposable litter-tray liner to prevent the tray becoming contaminated with oocysts that have been present for more than one day. Scalding of the litter tray will kill any oocysts, but be careful not to burn yourself in the process!

Remember most cats become infected when they are kittens, and excrete the infective oocysts only for one very brief period lasting not more than 3 weeks, after which they are no longer a potential source of this zoonosis. Pregnant women or immunocompromised individuals should not acquire new kittens, but if they already own an older cat they do not need to get rid of it. Someone else other than the pregnant woman should be in charge of

litter-tray clean up, or if that is not possible, ensure the feces are removed daily.

It is **NOT** advisable to test your cat for toxoplasma infection because it is not common for humans to be infected with toxoplasma by contact with cats and serological testing cannot predict whether a cat is shedding or not. People usually acquire the infection from eating raw meat or ingesting oocyst-contaminated soil, not from cats, and there is no correlation between cat ownership and human infection rates. The excretion period is so brief that by the time serological tests can reveal that a cat has been recently infected, it would have already finished. Also, because of the brevity of the excretion period, testing for the presence of oocysts in cats' feces is not recommended because the chances of discovering this brief infective period are remote.

Toxoplasma can only cross the placenta (potentially resulting in disease of the fetus) if a woman is infected with *T.gondii* for the first time while she is pregnant. Hence, if a toxoplasma test were to be performed, it would be more useful to test the mother prior to or shortly after becoming pregnant, rather than to test the cat. If the mother tests positive, it means that she has already been infected, *T.gondii* will not cross the placenta, and the fetus is not at risk. If the test turns out to be negative, she needs to be careful, but the advice is the same anyway: follow the guidelines outlined above.

Studies have also found that, because they are such fastidious groomers, cats' coats are not contaminated by toxoplasma oocysts even when excreting the organism. So there is no risk of acquiring this particular infection from touching or petting cats. It has also been shown that HIV-positive individuals with a cat in the household are not at any greater risk of acquiring toxoplasmosis than those without a cat. If an AIDS sufferer does develop clinical or symptomatic toxoplasmosis, it usually results from previously acquired tissue cysts becoming virulent. There is thus no need for an HIV-positive person to relinquish ownership of their cat.

Although clinical toxoplasmosis may respond to appropriate antibiotics, there is no benefit to treating a healthy cat with antibiotics for toxoplasma, as this will not clear the organism from the cat.



