



Part 2 of 2

Toxoplasmosis & Tapeworms: Busting the Myths of Zoonoses

It is important for the veterinary team to educate clients about zoonotic diseases (ie, diseases communicable from animals to humans under natural conditions) and how they can reduce the risk of disease transmission between themselves and their pets. Toxoplasmosis and tapeworm infestation are 2 problems caused by parasites that are often misunderstood by clients—and the healthcare team.

Toxoplasmosis

A common misconception is that pregnant women must give up their cats because of the risk of *Toxoplasma gondii* infection. First-time infection of women in early pregnancy can have significant effects on the fetus, potentially leading to abortion, neonatal death, or congenital effects. Similarly, infection in immunocompromised individuals (particularly AIDS patients) can cause encephalitis and other very serious complications. Children may ingest infectious oocysts from soil during play, but infection is not known to cause significant issues as long as they are immunocompetent. Although cats are the definitive hosts of this parasite, keep these points in mind:

1 Almost all cats are infected with *T gondii* at some point, but very few are shedding *Toxoplasma* oocysts at any one time. Most cats shed significant numbers of oocysts only for a couple of weeks after initial infection, typically at an early age. The likelihood of a healthy mature cat shedding *T gondii* oocysts is generally low.¹

2 The oocysts shed in cat feces generally become infective at least 24 hours after they are passed. Cleaning the litter box daily will greatly reduce the client's risk of infection.

3 Depending on a woman's location and lifestyle, she may

Common *Toxoplasma gondii* Exposure Routes^{2,3}

- Eating unwashed fruits & vegetables
- Eating undercooked meat from infected animals (eg, livestock, game)
- Using contaminated knives, cutting boards, or other utensils to handle food
- Drinking untreated water from a contaminated source
- Poor hand hygiene after working with contaminated soil (eg, in the garden)
- Contact with feces from a cat that is actively shedding *T gondii*.

also be exposed to *T gondii* from eating certain undercooked meats, or from contact with contaminated soil (see **Common *Toxoplasma gondii* Exposure Routes**). The parasite must be swallowed to cause infection—contact alone is not enough, but contamination and poor hygiene of the hands can lead to oral transmission.

The bottom line: Pregnant women can keep their cats, but should take precautions to reduce the risk of *T gondii* exposure, including avoiding adopting a cat younger than 1 year, having someone else clean the litter box (ideally daily), cooking meat properly (visit foodsafety.gov/index.html for information about proper temperatures), and washing hands thoroughly after working in soil or handling cat litter.

Tapeworms

Veterinary clients often have questions about tapeworms because many times (but not always) they are a fairly obvious—and “icky”—problem. Some of the concern stems from the fact that pets can be infected by several species of tapeworms, with different

epidemiologies. With the exception of echinococcosis (see **Table**, page 16), most tapeworm infections in animals and humans do not cause signs of illness unless large numbers of the parasite, or a very sensitive organ such as the brain, are involved. Here are some key points about tapeworms in pets:

- The most common tapeworm in dogs and cats in North America (*Dipylidium caninum*) is transmitted by swallowing infected fleas, whether or not the pet is flea-infested. Human infection is very rare.¹
- Several *Taenia* spp tapeworms infect dogs and cats but rarely cause infection (either intestinal or extraintestinal) in humans.¹ The life cycle of the most common zoonotic *Taenia* that infects humans involves livestock (eg, cattle, pigs), not pets.
- *Echinococcus* tapeworms are a much bigger concern. Their prevalence varies greatly by region, but their range seems to be expanding.⁴ They are tiny compared with *D caninum* and *Taenia* spp tapeworms, and the minute worm segments are almost never seen. The eggs can be found on a fecal float and look exactly like



Table. Tapeworm Species Transmitted Between Humans & Pets*

Tapeworm group	Tapeworm species	Definitive host (intestinal worm)	Intermediate host (cyst stage)	Notes
<i>Dipylidium</i> spp	<i>D caninum</i>	Dogs, cats, humans (rare)	Fleas	Transmitted by swallowing infected adult flea
<i>Taenia</i> spp**	<i>T solium</i>	Humans	Cysticercosis Pigs, humans	Intestinal infection from eating undercooked pork; cysticercosis from contact with human sewage
	<i>T saginata</i>	Humans	Cattle	Intestinal infection from eating undercooked beef
	<i>T multiceps</i> <i>T crassiceps</i> <i>T serialis</i>	Dogs	Small prey, humans (rare)	Rare cause of cysticercosis
<i>Echinococcus</i> spp	<i>E granulosus</i>	Wild canids (especially foxes & wolves), dogs	Cystic echinococcosis Humans, medium-to-large prey (rabbits, sheep, moose)	Eggs identical to <i>Taenia</i> spp Infection in humans is uncommon or rare in some areas, but can be extremely serious
	<i>E multilocularis</i>	Wild canids (especially foxes), dogs, cats	Alveolar echinococcosis Humans, small prey (voles, mice, lemmings)	

* Adapted from the Tapeworms infosheet, available from wormsandgermsblog.com

** Several other *Taenia* species can infect dogs and cats (eg, *T pisiformis*, *T taeniaeformis*), but their intermediate hosts are small prey species and do not infect humans.

Taenia eggs. Unlike *Taenia* species, *Echinococcus* can cause significant disease in humans in the form of slow-growing hydatid or alveolar hydatid cysts. Infection may not be diagnosed for years or decades, and treatment can be very difficult by the time cysts are detected.⁵

Most tapeworm infections are more of a nuisance than a threat, but they are still an important public health issue. If you live in an area where *Echinococcus* is endemic, or if any of your patients may travel to such an


area,⁵ make sure your clients know the risks. Some simple tips for preventing tapeworm infections include:

- Perform a fecal test for tapeworm and other parasite eggs at least annually on pets (especially those that go outside) to assess the need for treatment for an intestinal infection.
- Flea control is essential to prevent *D caninum* infection.
- Do not allow pets to hunt or scavenge other animals, especially in *Echinococcus*-endemic areas.
- Pick up pet feces promptly and

wash hands thoroughly afterward.

- Wear gloves and wash hands thoroughly after working in soil, especially if contamination with fox or feral dog feces is possible.

Myths & Realities

The entire veterinary team must be knowledgeable about the myths and realities of these parasites. Use the resources provided (see **Read All About It**) to educate both team members and clients. Printed or online resources available in the practice are invaluable for both informing clients and initiating conversations about these important topics. 

See **Aids & Resources, back page, for references & suggested reading.**

Editor's note: Part 1, Bacterial Pathogens: Busting the Myths of Zoonoses, was published in the July 2014 issue of Veterinary Team Brief.



READ ALL ABOUT IT

- **Worms & Germs Blog: Promoting Safe Pet Ownership.** University of Guelph & Centre for Public Health and Zoonoses; <http://www.wormsandgermsblog.com>
- **Zoonotic Diseases.** Center for Food Security and Public Health; <http://www.cfsph.iastate.edu/Zoonoses/index.php>