Toxocariasis in cats, caused by infection with *Toxocara cati* (syn. *Toxocara mystax* [Zeder, 1800]), is diagnosed worldwide; in the United States, *T. cati* was detected by fecal flotation for 4% of cats in 2022, although those results may underestimate the exact prevalence.\(^1\) Although cases have been reported in every U.S. state, risk for infection is higher in the northeastern states but is also high in certain southern states (e.g., Mississippi) and midwestern states (e.g., South Dakota).\(^1\)

**PARASITE LIFE CYCLE**

In cats infected via ingestion of larvated eggs in feces or soil, the larvae will migrate through the liver, lungs, and trachea, where they are ultimately coughed up and swallowed, and then mature to adults in the small intestine. In contrast, when a cat is infected via ingestion of larvae in a paratenic host (e.g., a mouse or, less commonly, an earthworm, cockroach, chicken, or sheep), the larvae mature without migrating to the liver or lungs. Rarely, kittens are infected by transmammary transmission from an acutely infected lactating queen; in these kittens, larvae mature without hepatopulmonary migration.\(^2,3\) The prepatent period (before eggs are shed in the feces) is 8 weeks. Compared with *Toxocara canis* (*T. canis*), the life cycle of *T. cati* (FIGURE 1) nematodes differs in that tracheal migration and maturation to adult worms continue into adulthood in cats (whereas tracheal migration is considered unlikely in dogs greater than 2 months old) and because transplacental transmission is not considered a route of infection for *T. cati*.\(^2\)

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**Abstract**

*Toxocara* is a genus of ascaridoid nematodes that inhabit the small intestine of mammals as adults. *Toxocara cati* (*T. cati*) is a roundworm that infects cats through ingestion of eggs in soil or feces, ingestion of larvae in paratenic hosts, or, rarely, via transmammary transmission. Clinical signs in cats are uncommon but can involve the gastrointestinal and/or respiratory tracts. Although not considered life-threatening, *T. cati* infections should be diagnosed and treated as they represent a zoonotic risk for humans and are difficult to eradicate from a contaminated environment.
Take-Home Points

- *Toxocara cati* is a common parasite that infects cats of all ages.
- Infection can occur by ingesting eggs in soil or feces, by ingesting larvae in paratenic hosts, or, rarely, through transmammary transmission.
- Clinical signs are uncommon but may include diarrhea, vomiting, and coughing.
- Many drugs are available for treatment, and some can prevent vertical transmission of the parasites to offspring.
- *Toxocara cati* has zoonotic potential; therefore, environmental decontamination is valuable, although often difficult.
- Infection can be prevented by early diagnosis and treatment as well as restricting hunting by cats.

**DIAGNOSIS**

Infected kittens will exhibit illthrift, diarrhea, and a pot-bellied appearance; adult cats may vomit, and adult ascarids are occasionally found in the vomitus. Necropsy of currently or previously infected cats may reveal focal scarring of the liver secondary to hepatic migration of larvae, but this finding is considered incidental. Larval migration through the lungs may result in hemorrhage and inflammation of the pulmonary alveoli, resulting in overt pulmonary disease. Previous reports have described perforated gastric ulcers and pulmonary artery hypertrophy with *T cati* infection, but these findings have not been corroborated in recent years. Typically, the clinical signs of *T cati* infection are not as severe as those caused by *T canis* infection in dogs (which can be fatal after intestinal obstruction or rupture).

Adult worms can be found not only in the vomitus of infected cats but also in the feces of cats after appropriate treatment. Male *T cati* worms are typically 3 to 6 cm long while the females are generally longer,

![FIGURE 1. Life cycle of Toxocara cati parasites.](image-url)
ranging from 4 to 10 cm. T cati worms are recognizable by their broad cervical alae, resulting in an arrowhead shape, for which they are named (toxo = “arrow,” cara = “head”). These alae, coupled with the often ventrally curved anterior end, give these nematodes a cobra-like appearance. Examination of the anterior end may also reveal a glandular esophageal bulb, although visualization of this structure may require staining the specimen.

T cati eggs are distinguished by their dark brown to black coloration and round to elliptical, thick-shelled, pitted walls containing a single-celled embryo (FIGURE 2). Egg sizes vary, but they are generally described as being 61 to 65 × 71 to 75 µm. Aside from identification of adult worms or eggs, T cati infection can also be diagnosed by fecal antigen test. Antigen testing enables detection of prepatent infections and infections in which only males are present, and therefore no eggs are shed.

The Companion Animal Parasite Council recommends testing kittens for intestinal parasites at least 4 times in the first year of life and twice a year thereafter. Although the prepatent period for T cati infection is 8 weeks, to combat any potential of hookworm infection, treatment for parasitic infection should be initiated at 2 weeks of age and repeated every 2 weeks until regular broad-spectrum parasite control is begun.

OUTCOMES

Although the consequences of T cati infection are not as lethal for cats as are the consequences of T canis infection for dogs, T cati infection remains a threat to humans (although less so than T canis), who may acquire the infection by ingesting eggs in contaminated soil or larvae in raw meat from paratenic hosts, most commonly raw liver. Eggs passed in cat feces develop to larvae in the environment after 2 to 4 weeks, after which time they are infective. The eggs are very hardy in the environment and can remain infective for years. Infected humans can experience a variety of conditions secondary to larval migration throughout the body, including visceral larva migrans (which causes hepatomegaly and pulmonary disease) and ocular larva migrans (which causes granulomatous retinitis and potentially blindness). Covert toxocariasis may also develop in humans, with nonspecific clinical signs such as chronic abdominal pain.

PREVENTION

Decontamination of the environment is difficult because T cati eggs are resistant to many common
The most effective method, although not always the easiest, is to cover the eggs with concrete or a foot of gravel. The best way to avoid zoonotic infection is to prevent contamination by routinely testing and treating infected animals, preventing hunting behaviors, promptly removing feces from the environment, and stopping indiscriminate defecation.

**CASE SCENARIO**

**Signalment and History**
A 9-week-old, intact male domestic shorthaired kitten was presented to an animal hospital for evaluation of general unthriftiness and diarrhea. The clients had recently adopted the kitten from a neighbor, whose outdoor barn cat had given birth. Questions posed to the neighbor indicated that the barn cat had recently had repeated bouts of vomiting, with “white sticks” appearing in the vomitus, which were saved in a plastic bag and brought in by the kitten’s owner for evaluation.

**Physical Examination**
The results of physical examination were unremarkable except for vague intestinal thickening detected by abdominal palpation.

**Diagnostic Test Results**
The “white sticks” from the vomitus of the adult cat were thin white nematodes, some as long as 12 cm, with 3 large fleshy lips at the anterior end and prominent lateral alae (FIGURE 3). The 3 lips and cervical alae were consistent with an ascaridoid nematode, possibly *T. cati* or *Toxascaris leonina*. The prominence of the lateral alae and the almost 90° angle at the junction of the posterior margin with the body differentiated this nematode from *T. leonina* worms, in which the alae are much narrower and taper at the posterior junction with the body.

Fecal examination consisted of centrifugal flotation with zinc sulfate (1.18 specific gravity). Examination revealed 65 × 75–µm dark brown eggs with thick, rough, pitted shells (FIGURE 2), which differentiated these eggs from those of *T. leonina* eggs, which have a smooth outer shell wall.

**Treatment Plan**
A topical broad-spectrum dewormer containing moxidectin and imidacloprid was applied to the kitten. The client was advised to monitor the kitten for adverse effects (e.g., hypersalivation, lethargy, application site pruritus or alopecia, decreased appetite, vomiting, ataxia) and to discontinue treatment if any were noted.

**Outcome**
After treatment, the kitten expelled adult worms in the feces for the next few days and rapidly improved. On follow-up examination 2 weeks later, fecal flotation with centrifugation was performed to evaluate drug effectiveness, and no eggs were found. The client was instructed to continue topical application once monthly to treat any newly acquired internal parasites or ectoparasites (e.g., fleas, ear mites) and to prevent heartworm infection.

**SUMMARY**
*T. cati* infection is a common, non–life-threatening condition of kittens and adult cats. Kittens can acquire...
VETORYL® CAPSULES (trilostane)

5 mg, 10 mg, 30 mg, 60 mg and 120 mg strengths
Adrenocortical suppressant for oral use in dogs only.

BRIEF SUMMARY (For Full Prescribing Information, see package insert.)

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION: VETORYL Capsules are an orally active synthetic steroid analogue that blocks production of hormones produced in the adrenal cortex of dogs.

INDICATION: VETORYL Capsules are indicated for the treatment of pituitary and adrenal-dependent hyperadrenocorticism in dogs.

CONTRAINDICATIONS: The use of VETORYL Capsules is contraindicated in dogs that have demonstrated hypersensitivity to trilostane. Do not use VETORYL Capsules in animals with primary hepatic disease or renal insufficiency. Do not use in pregnant dogs. Studies conducted with trilostane in laboratory animals have shown that the drug has not been evaluated in lactating dogs and males intended for breeding.

WARNINGS: In case of overdosage, symptomatic treatment of hypoadrenocorticism should be initiated. Close monitoring of adrenal function is advised, as dogs previously treated with mitotane may be more responsive to the effects of VETORYL Capsules.

HUMAN WARNINGS: Keep out of reach of children. Not for human use. Wash hands after use. Do not empty capsule contents and do not attempt to divide the capsules. Do not handle the capsules if pregnant or if trying to conceive. Trilostane is associated with teratogenic effects and early pregnancy loss.

PRECAUTIONS: Hypoadrenocorticism can develop at any dose of VETORYL Capsules. A small percentage of dogs may develop corticosteroid withdrawal syndrome within 10 days of starting treatment. Mitotane (o,p'-DDD) treatment will reduce adrenal function. It is important to wait for both the recurrence of clinical signs consistent with hyperadrenocorticism and a post-ACTH cortisol level of > 9.1 μg/dL (> 250 nmol/L) before treatment with VETORYL Capsules is initiated. Close monitoring of adrenal function is advised, as dogs previously treated with mitotane may be more responsive to the effects of VETORYL Capsules.

ADVERSE REACTIONS: The most common adverse reactions reported are poor/reduced appetite, vomiting, lethargy/dullness, diarrhea, elevated liver enzymes, elevated potassium with or without decreased sodium, elevated BUN, decreased Na/K ratio, weakness, elevated creatinine, shaking and renal insufficiency. Occasionally, more serious reactions, including severe depression, hemorrhagic diarrhea, collapse, hyperadrenocortical crisis or adrenal necrosis/rupture may occur, and may result in death. Owners should be advised to discontinue VETORYL Capsules and contact their veterinarian immediately in the event potential drug intolerance is observed.

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