

# Toxoplasmosis

## Basics

### OVERVIEW

- “Toxoplasmosis” is a disease caused by *Toxoplasma gondii*
- *Toxoplasma gondii*—a protozoan parasite that infects nearly all mammals; cats are the definitive hosts (meaning that reproduction of *Toxoplasma gondii* occurs in cats, with the release of one form of the parasite [known as an “oocyst”] that sporulates and becomes infective); all other warm-blooded animals are intermediate hosts (they maintain cysts in various tissues, such as muscle; infection occurs when another animal or person eats the cyst-containing tissue, such as raw or under-cooked meat)

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Cats and dogs
- Cats are more commonly symptomatic than dogs

#### Mean Age and Range

- In one study, mean age was 4 years; range, 2 weeks–16 years

#### Predominant Sex

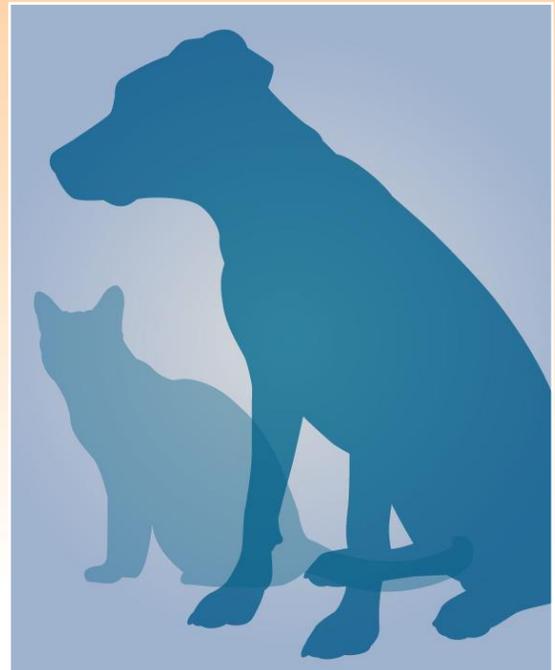
- Male cats—more common

### SIGNS/OBSERVED CHANGES IN THE PET

- Determined mainly by site and extent of organ damage
- Sudden (acute) disease—at the time of initial infection
- Long-term (chronic) disease—reactivation of infection (encysted *Toxoplasma* organisms); caused by decreased ability to produce a normal immune response (known as “immunosuppression”), which allows the cyst to rupture and for *Toxoplasma* organisms to infect new cells
- Non-specific signs of sluggishness (lethargy), depression, and lack of appetite (known as “anorexia”)
- Weight loss
- Fever
- Discharge from the eyes, avoidance of light (known as “photophobia”), constricted or narrowed pupils (known as “miotic pupils”) in cats
- Breathing distress
- Nervous system signs—wobbly, incoordinated, or “drunken”-appearing gait or movement (known as “ataxia”); seizures; tremors; weakness (known as “paresis”) or paralysis; cranial nerve deficits (the “cranial nerves” are nerves that originate in the brain and go to various structures of the head [such as the eye, face, and tongue])
- Digestive tract signs—vomiting; diarrhea; abdominal pain; yellowish discoloration to the gums and other tissues of the body (known as “jaundice” or “icterus”)

#### Cats

- Most severe in kittens infected across the placenta; kittens may be stillborn or die before weaning
- Surviving kittens—lack of appetite (anorexia); sluggishness (lethargy); high fever unresponsive to antibiotics;



inflammation of lungs leading to difficulty breathing (known as “dyspnea”) or increased noises while breathing; abnormalities of the liver, leading to yellowish discoloration to the gums and other tissues of the body (jaundice or icterus) and possible abdominal enlargement from fluid buildup (known as “ascites”); and central nervous system signs, if the infection involves the brain

- Respiratory and gastrointestinal disease following birth—most common; lack of appetite (anorexia); sluggishness (lethargy); high fever unresponsive to antibiotics; difficulty breathing (dyspnea); weight loss; yellowish discoloration to the gums and other tissues of the body (jaundice or icterus); vomiting; diarrhea; buildup of fluid in the abdomen (ascites)
- Nervous system disease following birth—seen in less than 10% of affected pets; blindness; stupor; incoordination; circling; contraction of the neck muscles, pulling the head to one side (known as “torticollis”); unequal size of the pupils (known as “anisocoria”); seizures
- Signs involving the eyes—common; inflammation of the iris (pigmented part of the eye) and other areas in the front part of the eye (known as “uveitis”); blood in the anterior chamber of the eye (the front part of the eye, between the cornea and the iris; accumulation of blood known as “hyphema”); dilated pupils (known as “mydriasis”); inflammation of the iris (known as “iritis”); separation of the back part of the eye (retina) from the underlying, vascular part of the eyeball (known as the “choroid”; condition known as “retinal detachment”); aggregates of inflammatory cells adhering to various areas of the inner lining of the cornea (known as “corneal endothelium”; condition known as “keratic precipitates”)—the cornea is the clear outer layer of the front of the eye
- Rapid course of disease—suddenly (acutely) affected pet with central nervous system and/or respiratory involvement
- Slow course of disease—pets with reactivation of long-term (chronic) infection

### Dogs

- Young dogs—usually generalized infection; fever; weight loss; lack of appetite (anorexia); inflammation of the tonsils (known as “tonsillitis”); difficulty breathing (dyspnea); diarrhea; vomiting
- Old dogs—tend to have localized infections; mainly associated with the muscles and nervous system
- Nervous system disease—signs are quite variable; usually reflect widespread (diffuse) nervous system inflammation; seizures; tremors; wobbly, incoordinated or “drunken” appearing gait or movement (ataxia); weakness ( paresis); paralysis; muscle weakness
- Signs involving the eyes—rare; similar to those found in cats
- Heart involvement—occurs; usually not clinically apparent

## CAUSES

- *Toxoplasma gondii*—a protozoan parasite

## RISK FACTORS

- Inability to develop a normal immune response (immunosuppression)—may increase likelihood of infection or reactivation of infection—feline leukemia virus (FeLV), feline immunodeficiency virus (FIV), feline infectious peritonitis (FIP), *Mycoplasma*, canine distemper virus, and administration of steroids or chemotherapy drugs, or following a kidney transplant

## Treatment

### HEALTH CARE

- Usually outpatient
- Inpatient—severe disease; pet cannot maintain adequate nutrition or hydration
- Dehydration—intravenous fluids

### ACTIVITY

- Confine—pets with nervous system signs

### DIET

- Maintain adequate nutrition and hydration

## Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Antibiotics—clindamycin for at least 2 weeks after clinical signs resolve; sulfadiazine in combination with pyrimethamine for 2 weeks (can cause depression, low red-blood cell count [known as “anemia”], low white-blood cell count [known as “leukopenia”], and low platelet count [known as “thrombocytopenia”], especially in cats); “platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding
- 1% prednisone drops applied to the eye directly (known as “topical treatment”)—for 2 weeks to treat inflammation of the iris (pigmented part of the eye) and other areas in the front part of the eye (uveitis)
- Folic acid or brewer's yeast—used to correct the decreased ability of the bone marrow to produce blood cells (known as “bone-marrow suppression”) caused by sulfadiazine/pyrimethamine treatment

## Follow-Up Care

### PATIENT MONITORING

#### Treatment with the Antibiotic Clindamycin

- Examine 2 days after initiation of treatment—clinical signs (such as fever, lack of appetite [anorexia], inflammation of the iris [pigmented part of the eye] and other areas in the front part of the eye [uveitis]) should begin to resolve; uveitis should resolve completely within 1 week
- Examine 2 weeks after initiation of treatment—assess muscles and nervous system; signs should resolve at least partially (some signs may be permanent)
- Examine 2 weeks after owner-reported resolution of signs—assess discontinuing treatment; some signs may be permanent

### PREVENTIONS AND AVOIDANCE

#### Cats

- Diet—prevent ingestion of raw meat, bones, viscera, or unpasteurized milk (especially goat's milk); or mechanical vectors (such as flies, cockroaches); feed only well-cooked meat
- Behavior—prevent free-roaming to hunt prey (such as birds or rodents) or to enter buildings where food-producing animals are housed

### POSSIBLE COMPLICATIONS

- Stillborn kittens or death of kittens
- Residual nervous system signs
- Death

### EXPECTED COURSE AND PROGNOSIS

- Prognosis—guarded; varied response to drug treatment
- Sudden (acute) disease—prompt and aggressive therapy often successful
- Residual deficits (especially nervous system signs) cannot be predicted until after a course of therapy; some signs may be permanent
- Eye disease—usually responds to treatment
- Severe muscular or nervous system disease—usually results in long-term (chronic) debility

## Key Points

- Cats—prognosis guarded in pets needing therapy; response to therapy is inconsistent
- Newborn pets and pets that cannot develop a normal immune response (severely immunocompromised pets)—prognosis is worse
- Considerable zoonotic potential; “zoonotic potential” refers to diseases that can be passed from animals to people

- Infected cats may shed oocysts in their bowel movement
- Avoid contact with oocysts or tissue cysts—do not feed raw meat; wash hands and surfaces (cutting boards) after preparing raw meat; boil drinking water, if source is unreliable; keep sandboxes covered to prevent cats from defecating in them; wear gloves when gardening; wash hands and vegetables before eating to avoid contact with oocyst soil contamination; empty cat litter boxes daily (oocysts need at least 24 hours to become infective); disinfect litter boxes with boiling water; control stray cat population to avoid oocyst contamination of environment
- Pregnant women—talk to your veterinarian and physician about what you can do to protect yourself from infection with *Toxoplasma*; understanding how the disease is spread and what you should do will protect your baby; you should avoid all contact with a cat that is excreting oocysts in feces; avoid contact with soil and cat litter; do not handle or eat raw meat (to kill organism, cook to 66°C [150°F]); *it is not necessary to give up your cat—practice good hygiene and take proper precautions for you and your baby*