

# Coccidiosis: Diagnosis, Treatment, and Prevention

## What is Coccidiosis?

*Coccidiosis* is an intestinal disease that affects several different animal species including canines and humans. *Coccidia* is one of the most prevalent protozoal infections in North American animals, second only to giardia. *Eimeria* and *Isospora* are the two genera that are often referred to as "coccidia." These two genera contain a large number of species that infect a variety of animals throughout the world.

The diseases caused by these microscopic protozoal parasites are referred to collectively as coccidiosis, and they vary tremendously in virulence.

Some species cause diseases that result in mild symptoms that might go unnoticed (i.e., mild diarrhea) and eventually disappear, while other species cause highly virulent infections that are rapidly fatal. The causative agent is a protozoan that has the ability to multiply rapidly. The major damage is due to the rapid multiplication of the parasite in the intestinal wall, and the subsequent rupture of the cells of the intestinal lining. Several stages of multiplication occur before the final stage, the oocyst, is passed in the feces. Oocysts are extremely resistant to environmental stress and are difficult to completely remove from the environment. Oocysts are frequent contaminants of feed and water and when the sporulated oocysts are ingested by other animals they start the life cycle over in the new host.

## Life Cycle of Coccidia

The life cycles of both genera of coccidia are similar. A host is infected when it ingests oocysts that have been passed in the feces of another host. The oocyst encysts in the host's small intestine, and the sporozoites contained within the oocyst are liberated. The sporozoites penetrate the cells of the host's small intestine and reproduce asexually. Each generation of asexual reproduction produces multiple merozoites; the merozoites are liberated from the cell and infect new cells. It is this stage of the infection that can result in destruction of massive numbers of cells in the host's small intestine and, ultimately, lead to the host's death. Some of the merozoites that enter the host's cells transform into gametocytes. The gametocytes transform into gametes, the gametes fuse, and the resulting zygote begins to develop into an oocyst. The developing oocyst escapes from the host's cell, and it is passed in the host's feces. Typically, when the oocyst is passed in the feces, it is not infective because it does not contain sporozoites; this is an unsporulated oocyst. After several days (or weeks, depending on the species) outside of the host's body, the oocyst completes development and sporozoites are found within; this is a sporulated oocyst, and it is infective to the next host (view diagram of the life cycle).

## Clinical Signs

Clinical signs of coccidiosis usually are present or shortly following stress such as weather changes; weaning; overcrowding; long automobile or plane rides; relocation to a new home and new owners; and/or unsanitary conditions. Symptoms or signs of coccidiosis will depend on the

state of the disease at the time of observation. In general, coccidiosis affects the intestinal tract and symptoms are associated with it. In mild cases, only a watery diarrhea may be present, and if blood is present in the feces, it is only in small amounts. Severely affected animals may have a thin, watery feces with considerable amounts of intestinal mucosa and blood. Straining usually is evident, rapid dehydration, weight loss and anorexia (off feed) also may be clinically visible. One of the most prevalent canine coccidia is *S. tenella* and during autopsies of dead animals appears as microscopic muscle cysts in the host animal. Oocysts in the feces of dogs are also microscopic in size and can only be positively identified through lab tests or direct observation under a microscope.

"Nervous coccidiosis" is a nervous system condition associated with coccidial infection. Signs are consistent with central nervous system involvement, and include muscle tremors, convulsions and other central nervous system symptoms. A consistent sign in "nervous cocci" dogs is that stimulation of any type seems to trigger the symptoms.

Death may follow the acute disease either directly or from secondary diseases such as pneumonia. Animals that survive for 10 to 14 days may recover, however, permanent damage may occur. Research has indicated that canines may experience reduced food consumption for up to 13 weeks following clinical infection. Diagnosis usually is obvious but confusion does exist – apparently normal animals can also have oocysts present in their feces. Diarrhea may be present in the animal before the oocysts can be found, therefore, a confirmed laboratory diagnosis may not always be possible. Laboratory findings should be correlated with clinical signs for a diagnosis.

The susceptibility of animals to this disease varies. The ingestion of oocysts may not produce the disease; some animals constantly carry them without being affected. Recovered animals develop immunity and seem to be partially resistant to reinfection.

Coccidiosis is frequently referred to as an opportunist – a disease that will develop when other stress factors are present. For example, the highest incidence of coccidiosis is in the first 21 days after a dog has changed owners and moved to a new residence. If a normal animal carries oocysts, it is relatively easy for rapid development when the conditions are right – adverse weather, shipping, dog food changes, new owners, new residence, and other stresses are important.

## **General Information**

General information on coccidiosis in canines:

1. Coccidiosis is an opportunistic disease – it generally affects stressed animals.
  2. Kennel conditions provide ideal circumstances for an outbreak.
  3. In most confinement situations, prevention with sulfadimethoxine drug such as Albon® is recommended.
  4. Mass treatment of all dogs in an entire kennel is usually the only effective method.
  5. Sick animals should be treated as soon as possible and isolated from the healthy animals.
  6. Have your veterinarian confirm positive diagnosis of the coccidia protozoa in your dog's feces through the use of lab tests or positive identification through direct observation under a microscope.
- How can I be sure my dog has Coccidia?  
Diagnosing coccidia is not easy. Diagnosis can be done in one of two ways: via fecal sample by a Vet or via educated evaluation of clinical findings by the breeder/owner or the Vet. Via fecal sample is not straightforward. Even when a flare is at it's worst, the

oocysts may not be shedding in every single stool. Therefore, a negative report does not rule out coccidia. The most thorough way to assess is to collect a sample from every single stool produced for 48 to 72 hours and have a Vet examine it.

**How can infection be treated?**

Treatment of infected animals is required. Individual treatment should be used when possible, however, medications are available for entire kennel applications. The actual coccidiosis problem is critical and in addition, dehydration and loss of appetite must be treated. Drug selection should be handled with regards to the number of animals infected and the type of application. Sulfas and antibiotics for secondary bacterial infections are available for use. Treatment and prevention are most effective when started early.