

Ehrlichiosis in Dogs

Drs. Foster & Smith Educational Staff

Canine ehrlichiosis is a disease of dogs and wild canids (e.g.; wolves) and is found worldwide. Canine ehrlichiosis is also known by other names such as 'tracker dog disease,' 'tropical canine pancytopenia,' 'canine hemorrhagic fever,' and 'canine typhus.' It affected a large number of military dogs in the war in Vietnam.

What causes ehrlichiosis?

Ehrlichiosis in dogs is most commonly caused by *Ehrlichia canis*, *E. chaffeensis*, *E. ewingii*, and possibly *E. ruminantium*. There are multiple strains of *Ehrlichia*, affecting different species of animals. Some also affect people. Some organisms that were formerly classified as *Ehrlichia* have now been reclassified as *Anaplasma*. The *Ehrlichia* organisms are what we call rickettsia, which on the evolutionary scale are between bacteria and viruses.

How is *Ehrlichia* transmitted?

Ehrlichia are transmitted by ticks including the Brown Dog Tick, *Rhipicephalus sanguineus* and the Lone Star Tick *Amblyomma americanum*. The immature form of the tick feeds on an animal infected with *Ehrlichia*. When these immature ticks or a mature form of the tick feeds on another animal, the *Ehrlichia* is passed on to that animal. The *Ehrlichia* can remain alive in the developing tick for up to 5 months. This means a tick could become infected in the fall, and infect a dog the following spring.

Because the disease is transmitted by these ticks, it can occur wherever Brown Dog and Lone Star Ticks are found. Almost every state in the United States has reported a case of ehrlichiosis.

What are the symptoms of ehrlichiosis?

Ehrlichiosis can have three phases. Signs of the acute phase of the disease usually develop 1-3 weeks after the bite of the infected tick. The acute phase of the disease generally lasts 2-4 weeks. The *Ehrlichia* enter white blood cells and reproduce inside of them. In addition to the blood, these cells are found in the lymph nodes, spleen, liver, and bone marrow. Platelets, the small cell fragments that help blood to clot, are often destroyed, as well. As a result of the infection, the lymph nodes, liver, and spleen are often enlarged. Anemia, fever, depression, lethargy, loss of appetite, shortness of breath, joint pain and stiffness, and bruises are often seen. Many dogs will be able to fight off the infection. If not, they enter the subclinical phase.

In the subclinical phase the animal may appear normal or show only slight anemia. During this phase the *Ehrlichia* live inside the spleen. This phase can last for months or years. Ultimately, the dog either eliminates the *Ehrlichia* from the body or the infection may progress to the chronic phase.

The chronic phase can be either mild or severe. Weight loss, anemia, neurological signs, bleeding, inflammation of the eye, edema (fluid accumulation) in the hind legs, and fever may be seen. Blood tests show that one or all of the different blood cell types are decreased. One cell type, the lymphocyte may increase and be abnormal in appearance. This can sometimes be confused with certain types of leukemia. If a dog becomes chronically infected, the disease can keep coming back, especially during periods of stress. In some cases, arthritis or a kidney disease called 'glomerulonephritis' may develop.

A decrease in the number of platelets (platelets help the blood clot) in the blood is the most common laboratory finding in all phases of the disease. Changes in the protein levels in the blood are common. The most common protein, albumin, is decreased and other types of protein called 'globulins' are increased.

Since one tick could be infected with and transmit more than one disease (e.g.; [haemobartonellosis](#) or [babesiosis](#)), it is not all that uncommon to see a dog infected with more than one of these diseases at a time, which generally causes more severe symptoms.

How is ehrlichiosis diagnosed?

The diagnosis is based on the typical clinical signs and results of special blood tests.

Two blood tests that detect the dog's antibodies (proteins produced to fight off the infection) to *Ehrlichia* are available. One is called the indirect immunofluorescent antibody (IFA) test, and the other is known as an ELISA test. A veterinarian cannot rely solely on these tests to make a diagnosis. The antibodies may not be detected in the early phase of the disease, since it takes some time for the body to make them. Also, if a dog is extremely ill, he may not be able to produce enough antibodies to be accurately detected. A positive test demonstrates that the dog has been exposed to *Ehrlichia*, but not that he necessarily is currently infected. In the acute stage of the disease, the antibody level will rise significantly. Often two tests will be done 2 weeks apart and the results compared. Dogs with an active infection will show a significant rise in the amount of antibody present.

The antibodies can last for one or more years after the infection, but they do not make the dog immune to ehrlichiosis - the dog could get reinfected.

A newer diagnostic test called the PCR tests for the presence of the organism itself, not antibodies to it. Unfortunately, it does not distinguish between live and dead organisms. For this reason, it is generally recommended to perform the PCR along with

one of the antibody tests to make a diagnosis.

Sometimes, the organism can be seen inside cells on a blood smear. To find them, a small drop of blood is spread over a microscope slide, stained and examined under the microscope. The organism can only be found in the bloodstream for a few days during the acute phase of the disease. So this method of diagnosis could miss some cases of the disease.

How is ehrlichiosis treated?

The antibiotics, tetracycline or doxycycline are used. Treatment is usually for 3-4 weeks, even though the dog's symptoms generally improve after several days of therapy. Some dogs will need blood transfusions or intravenous fluids depending on the severity of the disease. Generally, the prognosis during the acute phase is good, if the animal is properly treated. Dogs who go on to the chronic phase have a poorer prognosis. German Shepherds and Doberman Pinschers tend to have a more severe chronic form of the disease.

The drug, imidocarb dipropionate, is sometimes used in conjunction with the antibiotics. It is given as an injection, but may not be available in all areas.

Some of the damage caused by *Ehrlichia* may be due to the dog's own immune response to the organism. For this reason, if immune-mediated arthritis or decrease in platelets occurs, corticosteroids (e.g., prednisolone) may be given.

How can I prevent ehrlichiosis in my pet?

[Tick control](#) is the main way to prevent ehrlichiosis. Products which repel and kill ticks such as those containing permethrins are excellent choices. Tick collars containing the active ingredient amitraz (Preventic collars) are also used, sometimes in conjunction with permethrin products in those areas with high tick infestations. If a large number of cases of ehrlichiosis are diagnosed in an area, some veterinarians recommend placing dogs on low doses of tetracycline or doxycycline during the tick season.

There is no vaccine for ehrlichiosis.

Can people get ehrlichiosis?

Yes. The common symptoms in people include fever, chills, headache, and muscle aches. Other less common symptoms include nausea, loss of appetite, weight loss, abdominal pain, cough, diarrhea and change in mental status.

People do NOT get infected directly from a dog, but through a tick bite. Also, the *Ehrlichia* species most often implicated in human infections is *E. chaffeensis*.