



# Diseases Caused by Various *Ehrlichia* (Ehrlichiosis)

## Basics

### OVERVIEW

- “Ehrlichiosis” is the medical term for diseases caused by various species of *Ehrlichia*
- *Ehrlichia* species are disease-causing agents that are transmitted by ticks
- In addition, two other genera, known as *Anaplasma* and *Neorickettsia*, are included in the same family of organisms as *Ehrlichia* (and some were previously named as *Ehrlichia* species), thus they are included under the diseases known as “ehrlichiosis”

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs
- Cats

#### Breed Predilections

- Long-term (chronic) ehrlichiosis, caused by *Ehrlichia canis*—seems more severe in Doberman pinschers and German shepherd dogs than in other dog breeds

#### Mean Age and Range

- Average age—5.22 years
- Range—2 months—14 years of age

### SIGNS/OBSERVED CHANGES IN THE PET

- Duration of clinical signs from initial sudden (acute) illness to presentation to the pet's veterinarian is usually greater than 2 months
- Sluggishness (lethargy)
- Depression
- Lack of appetite (known as “anorexia”) and weight loss
- Fever
- Spontaneous bleeding—sneezing, bleeding from the nose or nasal passages (known as “epistaxis” or a “nose bleed”)
- Breathing distress

- Wobbly, incoordinated or “drunken” appearing gait or movement (known as “ataxia”)
- Head tilt
- Eye pain (inflammation of the iris [colored part of the eye] and other areas in the front part of the eye [known as “uveitis”])

### **Sudden (Acute) Ehrlichiosis**

- Bleeding disorder, characterized by pinpoint areas of bleeding (known as “petechia”) in the gums, as a result of a low platelet count (known as “thrombocytopenia”; “platelets” are 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;)
- Fever, depression, lack of appetite (anorexia), weight loss
- Generalized enlarged lymph nodes (known as “lymphadenopathy”)
- Ticks—found in 40% of cases
- Difficulty breathing (known as “dyspnea”) and possible bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red blood cells (known as “cyanosis”); increased lung sounds may be noted when listening to the chest with a stethoscope (known as “auscultation”)
- Widespread (diffuse) central nervous system disease (inflammation of the membranes covering the brain and spinal cord [known as “meningitis”])
- Wobbly, incoordinated or “drunken” appearing gait or movement (ataxia)
- The pet's sense of balance is altered (known as a “vestibular disorder”)
- Generalized or localized areas where the pet is overly sensitive to pain or touch (known as “hyperesthesia”)
- Most dogs recover without treatment and enter a subclinical state; a “subclinical state” is one in which the pet is infected, but has no signs of disease

### **Long-Term (Chronic) Ehrlichiosis**

- Spontaneous bleeding
- Low red blood cell count (known as “anemia”)
- Generalized enlarged lymph nodes (lymphadenopathy)
- Fluid buildup (known as “edema”) in the scrotum and legs
- Enlarged spleen (known as “splenomegaly”)
- Enlarged liver (known as “hepatomegaly”)
- Inflammation of the iris (colored part of the eye) and other areas in the front part of the eye (uveitis); 75% of affected pets have uveitis involving both eyes; uveitis can be the only sign present
- 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”)
- Bleeding into the back of the eye (known as “retinal hemorrhages”) and 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”) with blindness
- Fluid buildup in the clear part of the eye (known as “corneal edema”)
- Inflammation of the joints (known as “arthritis”)—rare
- Seizures—rare

## **CAUSES**

- Dogs—can be infected with a number of species of *Ehrlichia*; *Ehrlichia canis*, *Anaplasma platys*, *Anaplasma phagocytophila*, *Ehrlichia ewingii*, and *Ehrlichia chaffeensis* produce main disease entities
- Cats—*Neorickettsia risticii*, *Anaplasma phagocytophila*; possibly a species similar to *Ehrlichia canis*

## **RISK FACTORS**

- Co-existent infection with other blood parasites (such as *Babesia*, *Haemobartonella*, *Anaplasma platys*, and *Hepatozoon canis*)—worsens clinical syndrome

# **Treatment**

## **HEALTH CARE**

- Inpatient—initial medical stabilization for low red blood cell count (anemia) and/or bleeding tendency resulting from low platelet count (thrombocytopenia)
- Outpatient—stable pets; monitor blood and response to medication frequently
- Balanced fluids are indicated for dehydration
- Blood transfusion may be indicated for low red blood cell count (anemia)
- Platelet-rich plasma or a blood transfusion is indicated for bleeding resulting from a low platelet count (thrombocytopenia)

## ACTIVITY

- Restricted

## SURGERY

- If surgery is needed for other reasons, blood transfusion may be needed to correct low red blood cell count (anemia) and/or low platelet count (thrombocytopenia)

## 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

- Doxycycline—generally administered by mouth for 14–28 days; may be given intravenously, if the dog is vomiting
- Imidocarb dipropionate—reported to be effective against both *Ehrlichia canis*, but was not effective in a study of dogs infected with *Ehrlichia canis*
- Steroids—prednisolone or prednisone; may be indicated when the low platelet count (thrombocytopenia) is life-threatening (thrombocytopenia thought to be a result of immune-mediated mechanisms); because immune-mediated thrombocytopenia unrelated to ehrlichiosis is a principal differential diagnosis, steroids may be indicated until results of serologic tests (blood tests that detect the presence of antibodies to a certain disease-causing agent or antigen; an “antibody” is a protein that is produced by the immune system in response to a specific antigen) are available
- Androgenic steroids—to stimulate bone-marrow production of blood cells in dogs that have been infected for a prolonged time and that have decreased ability to produce blood cells in their bone marrow; androgenic steroids include oxymetholone and nandrolone
- Other antibiotics that may be administered include oxytetracycline or tetracycline (effective and less expensive) or chloramphenicol (avoids yellow discoloration of erupting teeth caused by tetracyclines in puppies under 6 months of age; however, chloramphenicol does have potentially serious side effects; discuss the use of chloramphenicol with your pet's veterinarian)

## Follow-Up Care

### PATIENT MONITORING

- Platelet count—every 3 days after initiating treatment, until normal; improvement is rapid in sudden (acute) infection
- Serologic testing (blood tests that detect the presence of antibodies to a certain disease-causing agent or antigen; an “antibody” is a protein that is produced by the immune system in response to a specific antigen)—repeat in 9 months; most dogs will become negative on the testing (known as “seronegative status”); positive titer suggests reinfection (prior infection does not imply protective immunity) or ineffective treatment (repeat treatment regimen)

### PREVENTIONS AND AVOIDANCE

- Control tick infestation—use products to kill and/or repel ticks as directed by your pet's veterinarian; any such products must be used according to the package label; flea and tick collars may reduce reinfestation, but reliability has not been proven; avoid tick-infested areas
- Removing ticks by hand—use gloves; ensure mouth parts are removed to avoid a foreign-body reaction

### EXPECTED COURSE AND PROGNOSIS

- Sudden (acute) ehrlichiosis—excellent prognosis with appropriate treatment
- Long-term (chronic) ehrlichiosis—may take 4 weeks for a clinical response; prognosis poor with decreased ability to produce blood cells in the bone marrow (known as “hypoplastic marrow”)

## Key Points

- Sudden (acute) ehrlichiosis—prognosis excellent with appropriate therapy
- Long-term (chronic) ehrlichiosis—response may take 4 weeks; prognosis poor with severely decreased ability to produce blood cells in the bone marrow (known as “severe hypoplastic marrow”)
- Progression from sudden (acute) to long-term (chronic) ehrlichiosis can be prevented easily by early, effective treatment; but many dogs remain positive on serologic tests (blood tests that detect the presence of antibodies to a certain disease-causing agent or antigen; an “antibody” is a protein that is produced by the immune system in response to a specific antigen) and may relapse (even years later)
- Doberman pinschers and German shepherd dogs appear to have a more long-term (chronic) and severe form of disease than other breeds

## Notes

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