

Ehrlichiosis and Anaplasmosis

DISEASE IN ANIMALS

These are a group of rickettsial diseases caused by obligate intracellular coccobacilli. They are usually named according to the host species and type of white blood cell they infect. There are several others not endemic to the United States such as *Ehrlichia ruminantium* (formerly *Cowdria ruminantium*), that causes heartwater in ruminants. The table below lists those agents that might be found in or around Ohio.

AGENT	PRIMARY VECTOR	ANIMAL DISEASE	HUMAN DISEASE
<i>Ehrlichia chaffeensis</i>	Lone Star Tick (<i>Amblyomma americanum</i>)	Canine monocytic ehrlichiosis	Ehrlichia chaffeensis infection (formerly HME)
<i>Ehrlichia canis</i>	Brown dog tick (<i>Rhipicephalus sanguineus</i>)	Canine monocytic ehrlichiosis	None
<i>Ehrlichia ewingii</i>	Lone Star Tick (<i>Amblyomma americanum</i>)	Canine granulocytic ehrlichiosis	Ehrlichiosis infection (formerly Ehrlichiosis unspecified)
<i>Anaplasma phagocytophilum</i> (formerly <i>Ehrlichia equi</i> and <i>Ehrlichia phagocytophilia</i>)	Blacklegged Tick (<i>Ixodes scapularis</i>)	Canine & equine granulocytic anaplasmosis: Tick-borne Fever in ruminants	Anaplasmosis (formerly (HGE then HGA)
<i>Neorickettsia risticii</i> (formerly <i>Ehrlichia risticii</i>)	Unknown tick or helminth	Potomac Horse Fever (Equine monocytic ehrlichiosis)	None
<i>Anaplasma marginale</i> , <i>ovis</i> , <i>centrali</i>	Multiple vectors (ticks, biting flies, gnats)	Bovine, sheep & goat anaplasmosis	None

Reporting: Because ticks are the vectors of both human and animal diseases, lab-confirmed cases in animals can be voluntarily reported to the [local health department](#) and the Ohio Department of Agriculture.

Transmission: Ticks are usually infected as larva or nymphs from their wildlife hosts. They pass the infection to domestic animals during subsequent feeding. Infections can be transmitted by blood transfusion and mechanical transmission by biting insects has been suggested.

Anaplasma marginale, a rickettsia-like organism, is a little different in that it infects red, not white blood cells. Although ticks are considered the major vector, transmission by biting flies and gnats, castration tools, hypodermic needles, etc. are also possible.

Clinical signs: In dogs, signs are nonspecific: fever, lymphadenopathy, vomiting, diarrhea, lameness, edema of the hind legs, or cough. Bleeding disorders such as epistaxis, petechia, anemia, uveitis and chorioretinal lesions, have been described. Thrombocytopenia and leukopenia are often noted. In horses, there may be just fever, but also depression, icterus, arrhythmias, reluctance to move and distal limb edema. In ruminants, sudden fever, depression, followed by respiratory signs and abortion, can be seen.

Diagnostics: Diagnoses can be complicated by co-infection with more than one organism and cross-reaction in serological tests.

- Serology (IFA, ELISA, Western Blot)
- Cytology: identification of morula in peripheral blood smears or tissue
- PCR: detects antigen in the blood

Case classification:

- Suspected: a clinical case with signs consistent with anaplasmosis or ehrlichiosis, and exposure to ticks or a probable or confirmed case.
- Probable: a clinically suspect case with laboratory evidence from a screening or unvalidated test.
- Confirmed: a case that meets confirmatory testing criteria determined by a state or federal diagnostic laboratory.

DISEASE IN HUMANS

Reporting: Report by the end of the business week any suspected human illness or positive laboratory result to the LHD where the patient resides. If unknown, report to the LHD of the health provider or laboratory.

Human illness: Illness is characterized by acute onset of fever and one or more of the following symptoms or signs: headache, myalgia, malaise, anemia, leukopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash may be present in some cases. Intracytoplasmic bacterial aggregates (morulae) may be visible in the leukocytes of some patients.

Personal protection: Though infected animals will not directly transmit rickettsial infections to people, they may carry infected ticks. Precautions for preventing tick bites include protective footwear, clothing and insect repellents. Persons handling tick-infested dogs or entering tick habitats should check themselves frequently for ticks and remove them as soon as possible. Acaricides can be used on pets and livestock, and to treat barns and kennels.

FOR MORE INFORMATION

Disease in Animals

[The Merck Veterinary Manual | Anaplasmosis](#)

[Ehrlichia and related infections | AVMA Zoonoses Update](#)

[Iowa State University Center for Food Security and Public Health Animal Disease Factsheets](#)

Disease in Humans

[ODH Infectious Disease Control Manual](#)

[ODH Zoonotic Disease Program | Tick-borne Diseases](#)

[Ehrlichiosis | CDC](#)

[Anaplasmosis | CDC](#)