



## Ehrlichiosis

Ehrlichiosis is a general name for a group of acute, febrile, bacterial illnesses, caused by bacteria from the Anaplasmataceae family. There are three ehrlichial species that cause disease in humans in the United States: *Ehrlichia chaffeensis*, *Ehrlichia ewingii*, and *Ehrlichia muris*-like (EML). The disease is transmitted to humans through bites from an infected tick. Most cases in the United States are transmitted by the lone star tick (*Amblyomma americanum*), which are primarily found in the southeastern and south-central United States, from the eastern seaboard to Texas. Lone star ticks are not typically found in Arizona.

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### Signs and Symptoms

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Most people will develop symptoms within 7-14 days after exposure to an infected tick. Early symptoms are non-specific and include:

- Fever
- Headache
- Chills
- Malaise
- Muscle pain
- Gastrointestinal symptoms (nausea, vomiting, diarrhea, anorexia)
- Confusion
- Conjunctival injection
- Rash (in up to 60% of children, less than 30% if adults)

*It is important to note that few people will develop all symptoms and the number and combination of symptoms vary greatly from person to person.*

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### Diagnosis

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Antibodies to *Ehrlichia* are detectable 7–10 days after illness onset. The gold-standard serologic test looks for a four-fold change in IgG-specific antibody titers using immunofluorescence assay (IFA) on paired samples. The first sample should be taken within the first week of illness and the second should be taken 2–4 weeks later.

- Demonstration of a four-fold change in IgG-specific antibody titer by immunofluorescence assay (IFA) test in paired serum samples; or
- Detection of DNA by PCR on whole blood. This method is most sensitive within the first week of illness; may decrease in sensitivity after administration of antibiotics.

**NOTE:** IgM antibodies are less specific than IgG antibodies and are more likely to generate false positive results. IgM results alone should not be used for laboratory diagnosis.

**NOTE:** Antibody titers are frequently negative in the first 7–10 days of illness, thus serologic tests may be falsely negative during this time period. For accurate testing of suspect cases an acute and convalescent serum are necessary.



Common laboratory findings suggestive of Ehrlichiosis include leukopenia (reduced white blood cell count), thrombocytopenia (reduced platelet count), and elevated liver enzymes.

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## Treatment

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Use doxycycline as first-line treatment for suspected ehrlichiosis in patients of all ages. The use of doxycycline to treat suspected ehrlichiosis in children is recommended by both the CDC and the American Academy of Pediatrics Committee on Infectious Diseases. Use of antibiotics other than doxycycline increases the risk of patient death. At the recommended dose and duration needed to treat ehrlichiosis, no evidence has been shown to cause staining of permanent teeth, even when five courses are given before the age of eight.

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## In Maricopa County

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Although Ehrlichiosis is not present in Arizona, there are still cases in residents who have traveled to an endemic area or relocated to Arizona from an endemic area. From 2005 and 2011, there were 8 probable or confirmed cases of Ehrlichiosis reported to Maricopa County.

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## Prevention

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Reducing exposure to ticks is the best defense against Ehrlichiosis and other tick-borne infections. There are several approaches you and your family can use to prevent and control Ehrlichiosis.

- Use insect repellants containing from 10% to 35 % DEET when camping and hiking.
  - Wear light-colored long pants and long sleeved clothing so that ticks are easier to spot before they attach to the skin.
  - Remove ticks promptly, since attachment of more than 24 hours is required for disease transmission.
  - Avoid overgrown brush by walking in the center of the trail, and remove brush from personal residences.
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## Resources

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- [Centers for Disease Control and Prevention](http://www.cdc.gov/ehrlichiosis/) (CDC) Ehrlichiosis webpage: <http://www.cdc.gov/ehrlichiosis/>
- [Arizona Department of Health Services](http://www.azdhs.gov/phs/oids/vector/index.htm) (ADHS) Vector-borne & Zoonotic disease webpage: <http://www.azdhs.gov/phs/oids/vector/index.htm>
- [Arizona Department of Health Services 2013 Case Definitions](http://www.azdhs.gov/phs/oids/pdf/casedefinitions.pdf) (ADHS) 2013 Case Definitions: [www.azdhs.gov/phs/oids/pdf/casedefinitions.pdf](http://www.azdhs.gov/phs/oids/pdf/casedefinitions.pdf)
- [Tick-Borne Diseases of the United States](http://www.cdc.gov/lyme/resources/TickborneDiseases.pdf) (CDC) A reference manual for health care providers: <http://www.cdc.gov/lyme/resources/TickborneDiseases.pdf>
- [Tick removal](http://www.cdc.gov/ticks/removing_a_tick.html) (CDC): A reference manual for properly removing ticks: [http://www.cdc.gov/ticks/removing\\_a\\_tick.html](http://www.cdc.gov/ticks/removing_a_tick.html)