

# Tick-Borne Diseases in the U.S.

Disease	Symptoms						
<p><b>Ehrlichiosis</b> <i>Lone Star Tick</i></p> <ul style="list-style-type: none"> <li>▶ Up to 17% of patients develop life-threatening complications</li> <li>▶ Meningitis/encephalitis occurs in up to 20% of case</li> </ul> <p><b>Anaplasmosis</b> <i>Blacklegged Tick</i> <i>Western Blacklegged Tick</i></p> <ul style="list-style-type: none"> <li>▶ Less severe than Ehrlichiosis</li> </ul>	<p>These diseases display similar symptoms, which usually develop 1-2 weeks after being bitten by an infected tick. About half of patients may not remember having been bitten by a tick. The combination of symptoms varies greatly from person to person. If left untreated, patients may die in the second week of illness, or progress to febrile illness lasting 2-3 weeks. Among children, there is higher incidence in 5-19 year olds. Incidence peaks in warmer months (June, July) but can occur any time. Serious illness and complications are linked to delayed diagnosis.</p> <ul style="list-style-type: none"> <li>▶ Fever</li> <li>▶ Myalgia</li> <li>▶ Children may report nausea, vomiting, and anorexia early in the illness</li> <li>▶ Headache</li> <li>▶ Arthralgia</li> <li>▶ Altered mental state</li> </ul> <p>Specific symptoms:</p> <table border="0"> <tr> <td><b>Anaplasmosis</b></td> <td><b>Ehrlichiosis</b></td> </tr> <tr> <td>▶ CNS involvement uncommon</td> <td>▶ Up to 17% of patients develop life-threatening complications</td> </tr> <tr> <td>▶ Less severe than ehrlichiosis</td> <td>▶ Meningitis/encephalitis in up to 20% of cases</td> </tr> </table>	<b>Anaplasmosis</b>	<b>Ehrlichiosis</b>	▶ CNS involvement uncommon	▶ Up to 17% of patients develop life-threatening complications	▶ Less severe than ehrlichiosis	▶ Meningitis/encephalitis in up to 20% of cases
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<p><b>Heartland</b> <i>Lone Star Tick</i></p> <ul style="list-style-type: none"> <li>▶ An emerging infection first identified in Missouri</li> </ul>	<ul style="list-style-type: none"> <li>▶ Fever</li> <li>▶ Anorexia</li> <li>▶ Leukopenia</li> <li>▶ Fatigue</li> <li>▶ Diarrhea</li> <li>▶ Thrombocytopenia</li> <li>▶ Slightly elevated transaminases</li> </ul>						
<p><b>Lyme Disease</b> <i>Blacklegged Tick,</i> <i>Western Blacklegged Tick</i></p> <ul style="list-style-type: none"> <li>▶ Most prevalent in the Northeastern U.S. and in north central U.S.</li> </ul>	<p><b>Specifically in children:</b></p> <ul style="list-style-type: none"> <li>▶ Erythema migrans (EM) or “bull’s-eye” rash occurs in about 90% of children who present with LD. Rash is rarely painful and occurs 7-14 days after a tick bite             <ul style="list-style-type: none"> <li>• Rash is more likely to be in the head and neck areas</li> <li>• Most common manifestations of early disseminated LD are multiple EM rashes</li> </ul> </li> <li>▶ Arthritis is the most common presentation of late LD</li> </ul> <ul style="list-style-type: none"> <li>• Affects the large joints, especially knees</li> <li>• Causes discomfort, but intense pain is uncommon</li> <li>• If untreated, usually resolves then recurs in the same or another joint</li> <li>▶ Facial nerve palsy occurs in about 3% of children with LD</li> <li>▶ Meningitis occurs in 1-2%</li> <li>▶ Encephalitis, encephalopathy and polyneuropathy virtually never occur in children</li> </ul>						
<p><b>Rocky Mountain Spotted Fever (RMSF)</b> <i>American Dog Tick,</i> <i>Brown Dog Tick,</i> <i>Rocky Mountain Wood Tick</i></p> <ul style="list-style-type: none"> <li>▶ Most prevalent in the Northeastern U.S. and in north central U.S.</li> </ul>	<p>Symptoms typically begin 2-14 days after the bite of an infected tick. About half of those who develop RMSF do not remember being bitten. Children ages 0-9 and American Indians have an increased risk of fatal outcomes. Incidence is higher among males. The disease frequently begins as a sudden onset of fever and headache. Most people visit a healthcare provider during the first few days of symptoms. Because early symptoms may be non-specific, several visits may occur before the diagnosis of RMSF is made and correct treatment begins. Before the use of current antibiotics, fatality rates were as high</p>						

(continued on back)

Disease	Symptoms
<p>▶ <b>Children have a lower incidence rate compared to adults, but have highest risk of fatal outcomes.</b></p>	<p>as 65-80%. If RMSF is suspected, the child must be treated with doxycycline as soon as possible. If treatment is delayed beyond day five, outcomes are typically fatal. Use of antibiotics other than doxycycline is associated with a higher risk of fatal outcome.</p> <ul style="list-style-type: none"> <li>▶ Fever and chills</li> <li>▶ The spotted rash can occur earlier in children than in adults, usually a few days after the fever begins. Rash is absent or atypical in up to 20% of cases. Appears on palms and soles of feet 30% of the time. May cover entire body late in the progression of illness.</li> <li>▶ Myalgia (calf and back pain is common)</li> <li>▶ Headache in 60%, often severe. Younger children are less likely to report headache – be sure to ask them.</li> <li>▶ Sore throat, cough, difficulty breathing</li> <li>▶ Stomach pain, nausea, vomiting, diarrhea, loss of appetite</li> <li>▶ Altered mental status</li> </ul>
<p><b>Southern Tick-Associated Rash Illness (STARI)</b> <i>Lone Star Tick</i></p> <p>▶ <b>Bull's eye lesions are usually solitary and tend to be smaller, more circular in appearance, and more likely to have central clearing than those seen in Lyme disease patients</b></p>	<p>This tick-borne illness causes a rash with flu-like symptoms that has been mistaken for early Lyme disease. Experts are uncertain about the causative agent.</p> <ul style="list-style-type: none"> <li>▶ Red rash within 7 days with an expanding (<math>\geq 3</math>" "bull's-eye" lesion around the bite site. Often confused with Lyme disease. Rash should not be confused with much smaller areas of redness and discomfort commonly seen at the site of any tick bite.</li> <li>▶ Headache</li> <li>▶ Fatigue</li> <li>▶ Myalgia</li> <li>▶ STARI/Masters disease has not been linked to ongoing health problems.</li> </ul>
<p><b>Tularemia</b> <i>American Dog Tick,</i> <i>Lone Star Tick,</i> <i>Rocky Mountain Wood Tick</i></p> <p>▶ <b>Missouri, Arkansas, and Oklahoma have had the most cases 2001-2011. Tularemia has been diagnosed in all states but Hawaii.</b></p>	<p>Tularemia is more common in the months of May through September. Bites from infected ticks or deer flies usually occur in the summer months, but illness due to animal handling and hunting can occur at any time of the year. Incidence is highest among children ages 0-10. From age 10 on, tularemia is highest in males. Illness ranges from mild to life-threatening. All forms are accompanied by fever, which can reach 104 °F. Primary forms of this disease are:</p> <ul style="list-style-type: none"> <li>▶ <b>Ulceroglandular</b> – The most common form. It usually occurs following a tick or deer fly bite or after handling of an infected animal. A skin ulcer appears at the site where the organism entered the body. The ulcer is accompanied by swelling of regional lymph glands, usually in the armpit or groin.</li> <li>▶ <b>Glandular</b> – Similar to ulceroglandular tularemia but without an ulcer. Also generally acquired through the bite of an infected tick or deer fly or from handling sick or dead animals.</li> <li>▶ <b>Oculoglandular</b> – Occurs when the bacteria enter through the eye. This can occur when a person butchering an infected animal touches his or her eyes. Symptoms include irritation and inflammation and swelling of lymph glands in front of the ear.</li> <li>▶ <b>Oropharyngeal</b> – Results from eating or drinking contaminated food or water. Symptoms include sore throat, mouth ulcers, tonsillitis, and swelling of lymph glands in the neck.</li> <li>▶ <b>Pneumonic</b> – The most serious form. Symptoms include cough, chest pain, and difficulty breathing. Results from breathing dusts or aerosols containing the organism. Also occurs when other forms of tularemia (e.g. ulceroglandular) are left untreated and the bacteria spread through the bloodstream to the lungs.</li> </ul>