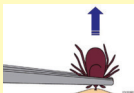


## TICK REMOVAL



- Longer the tick attachment, greater the risk of infection.
- Do not burn or use any substance on tick.
- Do not grasp, squeeze or twist the body of tick.
- Grasp tick close to skin with tweezers.
- Pull tick straight out.
- Use antiseptic on skin afterward.
- Disinfect hands thoroughly.
- Dispose of tick in tape or save for testing/identification

Remember, one tick bite can give you more than one disease.

*Always see a physician for possible diagnosis, testing and treatment, especially if tick parts remain after removal.*



Research, Education, Prevention, & Patient support

Lyme Disease Association, Inc.  
P.O. Box 1438 • Jackson, NJ 08527  
(888) 366-6611 (732) 938-7215 fax  
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LymeDiseaseAssociation.org  
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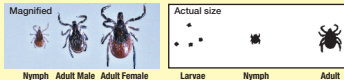
Tick photos courtesy of James L. Ocki, MA, MS and Robert S. Lane, PhD

## TICK IDENTIFICATION

### **Ixodes scapularis (deer tick, blacklegged tick)**

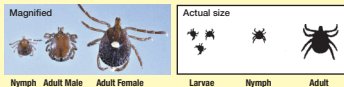
Found: Northeast, Upper Midwest, and much of the South

**Transmits:** Lyme, babesiosis, anaplasmosis, Powassan encephalitis, tick paralysis, tularemia, bartonellosis, ehrlichiosis (Ehrlichia muris-like), Borrelia miyamotoi, Borrelia mayonii.



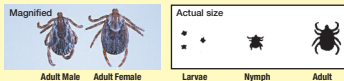
### **Amblyomma americanum (lone star tick)**

Found: Eastern U.S. **Transmits:** human monocytic ehrlichiosis, STARI, tularemia, tick paralysis, Q fever, Heartland virus. Can develop meat allergy after bite.



### **Dermacentor variabilis (dog tick)**

Found: All U.S. **Transmits:** Rocky Mountain spotted fever, tularemia, tick paralysis.



### **Ixodes pacificus (western blacklegged tick)**

Found: Far West **Transmits:** Lyme, babesiosis, anaplasmosis, bartonellosis.



## MAJOR TICK-BORNE DISEASES

### Lyme Signs & Symptoms

EM (bull's eye) rash at bite site (less than 50%), other types of rashes, rash at other than bite site, flu-like illness.

**Musculoskeletal:** joint/muscle pain in feet, swelling in toes, balls of feet, ankle pain, burning in feet, shin splints, joint pain or swelling, stiffness of the joints, neck or back, muscle pain or cramps that may migrate, neck creaks and cracks, neck stiffness, TMJ. **Reproductive:** testicular pain / pelvic pain, menstrual irregularity, milk production (lactation), sexual dysfunction or loss of libido. **Cardiac/Pulmonary:** chest pain or rib soreness, shortness of breath, heart palpitations, pulse skips, heart block, heart murmur or valve prolapse. Lyme carditis can cause death. **Neurological:** twitching of the face, eyelids or other muscles, headache, tingling, numbness, burning or stabbing sensations, facial paralysis (Bell's palsy), dizziness, poor balance, increased motion sickness, light-headedness, wooziness, difficulty walking, tremor, confusion, difficulty in thinking or with concentration or reading, forgetfulness, poor short term memory, disorientation (getting lost, going to wrong place), difficulty with speech, double or blurry vision, eye pain, blindness, increased floaters, increased sensitivity to light or sound, buzzing or ringing in ears, ear pain, deafness, seizure activity, white matter lesions, low blood pressure. **Neuropsychiatric:** mood swings, violent outbursts, irritability, depression, disturbed sleep (too much, too little, early awakening), personality changes, obsessive/compulsive disorder, paranoia, panic/anxiety attacks, hallucinations. **Gastrointestinal:** nausea or vomiting, difficulty eating, change in bowel function (constipation, diarrhea), gastritis, abdominal cramping, irritable bladder or bladder dysfunction, cystitis. **Other:** fever, sweats, or chills, weight change (loss or gain), fatigue, tiredness, hair loss, swollen glands, sore throat, difficulty swallowing, swelling around the eyes.

**Lone star tick bite meat allergy** - Tick saliva triggers immune response to alpha-gal found in red meat. Symptoms: anaphylaxis can occur.

**Babesiosis** - Protozoan, *babesia microti*, WA-1, MO-1; sometimes fatal in elderly or those without spleen. Symptoms include fever, chills, fatigue, headache, muscle pain, sweats & anemia.

**Bartonellosis** - *Bartonella* spp. can be transmitted by cat bite/scratch or tick bite when atypical presentations may result including visual problems, headaches, enlarged lymph nodes, resistant neurological deficits, new onset of a seizure disorder. Diagnosis by IFA and PCR.

**Ehrlichiosis** - Human monocytic ehrlichiosis caused by *Ehrlichia chaffeensis* (symptoms below).

**Anaplasmosis** - Caused by *Anaplasma phagocytophilum*. Symptoms of both ehrlichiosis and anaplasmosis include fever, malaise, headaches, chills, severe muscle aches. More severe illness may result if co-infected with Lyme disease. Lab tests show decreased white blood cells & platelets, elevated liver enzymes. Death can result.

**STARI (southern tick-associated rash illness)** - A Lyme-like disease transmitted by lone star tick, may get rash, other early Lyme symptoms, no test available.

**Rocky Mountain Spotted Fever** - Caused by the bacterium *Rickettsia rickettsii*. Symptoms include headaches, myalgia, and a characteristic rash usually beginning on wrists, ankles, palms, soles.

**Tularemia** - Caused by a bacterium, *Francisella tularensis*. Symptoms include headache, chilliness, vomiting, aching pains, fever. Infection site develops into an ulcer, swollen glands, sweating, weight loss, debility.

**Powassan Virus** - Caused by flavivirus. Tick bite to illness onset 1 week to 1 month. Can cause encephalitis & meningitis. Symptoms can include fever, head ache, vomiting, weakness, confusion, loss of coordination, speech difficulties, seizures, sometimes death.

**Borrelia miyamotoi** - Lyme-like, transmitted by deer tick. Symptoms include fever, headaches, muscle aches, chills. PCR diagnosis.

**Other tick-borne diseases** - Pacific Coast tick fever (Pacific Coast tick), tick-borne relapsing fever (ornithodoros tick), Colorado tick fever (Rocky Mt. wood tick), *Rickettsia parkeri* rickettsiosis (Gulf Coast tick), Bourbon virus (unknown tick), Heartland virus (deer tick), Q fever (deer tick)



*Support for this project has been provided by Rotary International*