Lyme Disease Association, Inc.
P.O. Box 1438, Jackson, NJ 08527
Toll-free info (888) 366-6611
E-mail: Lymeliter@aol.com
Website: www.LymeDiseaseAssociation.org

Tick Identification Guide

Ixodes scapularis (deer tick)
Found in Northeast & Upper Midwest
Transmits agents of: Lyme, babesiosis, anaplasmosis (aka human granulocytic ehrlichiosis), POWASSAN encephalitis, tick paralysis, tularemia, bartonella.
Ixodes scapularis have been shown to carry ehrlichiosis (HME), but to date, transmission is still in question.

Amblyomma americanum (lone star)
Found throughout United States
Transmits agents of: human monocytic ehrlichiosis, STARI (Southern tick-associated rash illness), tularemia, tick paralysis, Rocky Mountain spotted fever.

Dermacentor variabilis (American dog)
Found throughout the United States
Transmits agents of: Tick paralysis, Q fever, Rocky Mountain spotted fever, tularemia, human monocytic ehrlichiosis.

Dermacentor andersoni (wood)
Found in Rocky Mt. States & SW Canada
Looks similar to American dog tick (above)
Transmits agents of: Rocky Mountain spotted fever, tularemia, Colorado tick fever, tick paralysis.

Ixodes Pacificus (western black legged)
Found in West
Transmits agents of: Lyme, babesiosis, anaplasmosis (aka human granulocytic ehrlichiosis), bartonella.

Endorsed by:
International Lyme & Associated Diseases Society
A Medical and Research Organization for Health Science Professionals
www.ILADS.org

The following companies have supported publication of this educational material:

Lyme R Primer

Learn About Lyme & Other Tick-Borne Diseases
- Lyme Disease
- Anaplasmosis
- Babesiosis
- Ehrlichiosis
- Bartonella
- Rocky Mountain Spotted Fever
- Tularemia

Tick photos thanks to James L. Oski, MA, MS
& Robert S. Lane, PhD

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Lyme Disease Association
Funding research projects from coast to coast
- Is a national, all-volunteer 501(c)3 corporation.
- Contributions are tax deductible to the extent allowed by law.
- Provides input for federal and state Lyme legislation.
- Helps children with Lyme get a proper education.
- Sponsored first national medical conference focusing on Lyme disease in children & adolescents.
- Partnered with Time for Lyme & Columbia University to open the Lyme & Tick-Borne Diseases Research Center to study chronic Lyme.
- Run LymeKidz 4 Kids for kids w/o insurance.

Lyme Disease Association, Rhode Island Chapter, LDARIC
Lyme Disease Association, Pennsylvania Chapter (LDAPAC)
Lyme Disease Assn. Corning/Fingerlakes Area Chapter (NY)
Lyme Disease Association Eastern Connecticut Chapter
Lyme Disease Association Southeastern Florida Chapter
Oregon Lyme Disease Network
Minnesota Lyme Action Support Group
Harford Co. LDSG, Inc. (MD)
Florida Lyme Advocacy, Inc.
Texas Lyme Disease Association, TLDA (TX)
Lyme Disease Association of Southeastern Pennsylvania
Lyme Association of Greater Kansas City, LAGKC (KS/MO)
Lyme Disease Network of New Jersey, Lymenet.org
California Lyme Disease Association, (CALDA)
Time for Lyme, TFL (CT)

Other suggested resources:
http://Columbia-Lyme.org
http://www.LymeNet.org
http://www.IGeneX.com

A Medical and Research Organization
Providing personalized laboratory and research facility, providing educational seminars to over 1,000 private practice physicians, hospitals, and other clinical reference laboratories throughout U.S. and Canada.
800-832-3200 Fax 650-424-1196
lymex Inc. 79 Van Hornen St, E. Folsom CA 95630
lymex.com

Medical Diagnostic Laboratories, L.L.C.
800-832-3200 Fax 650-424-1196
lymex Inc. 79 Van Hornen St, E. Folsom CA 95630
lymex.com

New Jersey Laboratories
732-249-0188 Fax 732-249-2423

Tick services of a competent professional should be sought.
Understanding that the LDA is not engaged in rendering medical or other expert assistance is required, the information and educational material:

 Lyme & Pets
- Dogs, cats, horses, and cows can get Lyme disease and other tick-borne diseases and can be tested.
- Performed tick checks to protect your pets.
- Use veterinarian recommended products.
- Dogs - symptoms are unexplained lameness, fever, lethargy, loss of appetite.
- Cats - symptoms are excessive sleep, fever, appearing arthritic or lame, stop eating.

OtherTick-Borne Diseases
- Rocky Mountain Spotted Fever
- Tularemia
- Babesiosis
- Ehrlichiosis
- Bartonella
Lyme can cause death occasionally. Lyme symptoms can develop days or months after a tick bite. Treatment (Jarisch-Herxheimer reaction). Lyme patients often get worse before getting better on symptoms, history and examination. Lyme is a clinical diagnosis based on a patient's symptoms, history and examination. Not everyone who contracts Lyme disease gets a rash. CDC criteria are for surveillance purposes, not diagnosis. – in a nonendemic area, rash requires a positive test. According to the CDC surveillance criteria, an erythema migrans (EM) rash in an endemic area, means Lyme disease. The longer a tick attachment, the greater risk of disease transmission. According to the CDC surveillance criteria, an erythema migrans (EM) rash in an endemic area, means Lyme disease. According to the CDC surveillance criteria, an erythema migrans (EM) rash in an endemic area, means Lyme disease. Get the Facts. You can contract many tick-borne diseases simultaneously from the same tick bite. You can test negative and still have Lyme disease. The longer a tick attachment, the greater risk of disease transmission. To perform frequent, thorough tick checks. To wear light-colored clothes. To put clothes in dryer for 30 minutes to kill ticks. To tuck pants into socks. To perform frequent, thorough tick checks. To wash hands thoroughly. To use antiseptic on skin. To pull tick straight out. To grasp tick close to skin with tweezers. Lyme Bacteria:Borrelia burgdorferi – Go into cuticular blade, go dermantly and also mutate. – become sequestered in difficult to penetrate sites (central nervous system, joints, eyes). – Use body's own cells to shield them. – May have other than spirochete forms such as L-form/ wall deficient) and cystic form (giant body) which is less virulent. Antibody responses against the cell envelope are not indicated. Antibody responses against the cell envelope are not indicated. Have been found in patients after long-term treatment. May be associated with chronic Lyme. Lyme Signs & Symptoms EM (bull's eye) rash at bite site (less than 50%). Light forms of rash, rash at other than bite site. Flu-like illness. Musculoskeletal: joint pain, muscle in feet, swelling in two, 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 cramps and neck stiffness. Tmj. Reiterative: 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 drops, palpitation, heart block, heart murmur or valve prolapse. Neurological: twitching of the face, eyes, mouth or tongue, headache, tingling, numbness, burning or stabbing sensations, facial paralysis (Bell’s palsy), dizziness, poor balance, increased motion sensitivity. Light headedness. Sleep disorders, difficulty waking, tremor, confusion, difficulty in thinking or with concentration or reading, forgetfulness, poor short term memory, disorientation or loss of memory. Infectious diseases. Anaplasmosis. Symptoms include headache, myalgia, and a characteristic rash usually beginning on wrists, ankles, palms and soles. Treatment: tetracycline. Tularemia – Caused by a bacteria, Francisella tularensis. Symptoms include headache, fever, vomiting, achy pains, fever. Infection site develops into an ulcer, swollen glands, feeling, weight loss, debility. Treatment: tetracycline or gentamicin. Powassan Encephalitis – Caused by a virus, flavivirus, Powassan (POW). Transmitted by a tick. Black-legged deer tick, Ixodes scapularis, is the main vector. Rocky Mountain Spotted Fever – Caused by the bacteria Rickettsia rickettsii. Symptoms include headache, myalgia, and a characteristic rash usually beginning on wrists, ankles, palms and soles. Treatment: tetracycline. Ehrlichiosis – Caused by a bacterium, Ehrlichia chaffeensis. Symptoms may begin suddenly 7-14 days following infection, and include headache, fever, nausea and vomiting, and skin, and skeletal. Test for Tick-Borne Diseases Lyme Disease Tests: Antibody responses against the level of antibody produced by your body in response to the disease. Includes: ELISA, OliPette, IgG and IgM Western Blots. During the first year after a tick bite, less than 65% of patients produce antibodies, and they may not last. By year two, less than 50% of patients still have an antibody response. Antibody response tests are most effective starting 6-12 weeks after a tick bite, and accuracy rates vary considerably. Antibody levels may be negative after inadequate treatment with antibiotics. Antibody Capture: – an antibody test to the same problems as the test above. Culture: – grows actual organism. Difficult to do, but when positive, it is considered the gold standard of diagnosis. – Antigen Capture: – a highly defined antibody captures pieces of the Lyme organism. Actually checks for the presence of a piece of Lyme bacteria, which supports the diagnosis of active infection. Includes LDA (Lyme Dot Antigen Test for Enzyme and CSF). Polymerase Chain Reaction (PCR): – checks for the actual presence of the genetic material (DNA/RNA) of the organism. If the sample contains any DNA/RNA, the PCR is highly accurate. Can be performed on all tissues of the body. Babesiosis, Bartonella & Ehrlichiosis Tests: – Babesia – an IFA (IgG & IgM), FISH (Fluorescent in-situ Hybridization) and PCR may be ordered. Bartonellosis – an IFA and PCR for E. chaffeensis (HGE) and/or E. chaffeensis (HME) and PCR for HGE and HME are available. Bartonella henselae: an IFA and PCR are available. Crush tissue. Care must be taken when crushing patients who have been on long-term antibiotics. 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Babesiosis, Bartonella & Ehrlichiosis Tests: – Babesia – an IFA (IgG & IgM), FISH (Fluorescent in-situ Hybridization) and PCR may be ordered. Bartonellosis – an IFA and PCR for E. chaffeensis (HGE) and/or E. chaffeensis (HME) and PCR for HGE and HME are available. Bartonella henselae: an IFA and PCR are available. Other Tick-Borne Diseases One tick bite can give you many different diseases at the same time (co-infections). Treatments vary, examples provided as information only. Babesiosis – Malaria-like illness caused by the protozoan, Babesia microti, WA-1, MO-1, sometimes fatal in the elderly or those with no spleen. May be more severe in patients with coexisting Lyme. Symptoms include fever, chills, fatigue, headache, muscle pain, sweats and aemia. Treatment may be atovaquone with azithromycin or clindamycin and oral quinine. Bartonella illness – disease caused by Bartonella henselae or perhaps other sp. that can be transmitted either by a cat bite or scratch or a tick bite. When tick-borne, atypical presentation may result including visual problems, headaches, atypical lymphadenopathy, neurological deficits, and the new onset of a seizure disorder. Diagnosis is made by acute and convalescent antibody titers (IFA) and by PCR (DNA analysis). Treatment may be tetracycline and quinolone.