

# Lyme Disease Awareness and Prevention

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Lyme disease is a bacterial infection that may develop after a bite from a Lyme-infected deer tick. Many areas of the country are at high-risk for Lyme disease; this is especially true for wooded or forested regions. This handout offers some strategies for preventing Lyme disease. It also discusses what Lyme disease may look like so readers will understand the need to see a physician if these symptoms develop.

## Prevention

The best way to prevent Lyme disease is to avoid being bitten by a deer tick. Staying out of tick habitat is one strategy. Unfortunately, the Tick Management Handbook by Connecticut entomologist Kirby C. Stafford III, Ph.D. reports that most patients become infected around the home, making it difficult to avoid all sites of potential exposure. When complete avoidance isn't possible or desirable, the use of insecticides and repellents can reduce the risk of a tick bite. Insecticides work by killing ticks, repellents work by encouraging them leave before biting.

**Permethrin** is the active ingredient of insecticides; its use is essential to effective prevention programs. It can be applied to clothing, sleeping bags, tents and other materials or gear. You should **pre-treat your belongings before entering tick habitat**. The chemical bonds to fabrics and upon drying it does not transfer to skin. Depending on the product, it remains active for at least 2 weeks and through multiple washings. Permethrin should not be applied to skin. It has passed EPA safety tests and is used extensively by the US military. Retail products are made by various manufacturers and can be found at outdoor stores and on-line. Safety information is available at:

[http://www.epa.gov/oppsrrd1/REDs/factsheets/permethrin\\_fs.htm](http://www.epa.gov/oppsrrd1/REDs/factsheets/permethrin_fs.htm),  
[http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect\\_repellent.htm](http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm), <http://chppm-www.apgea.army.mil/documents/AFPMB-safetyofPermethrinUniforms21Sep01.pdf>.

**DEET** is the chemical ingredient in many repellents. There are a variety of strengths; to repel ticks the concentration needs to be 30% or higher. DEET is safe to apply to unbroken skin, wool and cotton but it can damage certain fabrics and materials. The EPA advises that anyone over 2 months of age may safely use DEET but Canada's health department differs on this point. Safety information is available at:

<http://www.epa.gov/pesticides/factsheets/chemicals/deet.htm>,  
<http://www.epa.gov/oppsrrd1/REDs/0002red.pdf>, [http://www.hc-sc.gc.ca/cps-spc/pubs/pest/\\_decisions/rrd2002-01/index-eng.php](http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/rrd2002-01/index-eng.php).

**Picaridin** is a newer repellent that is as effective as DEET. It is safe to apply to unbroken skin, fabrics and materials. It is non-toxic and safe to use on children of all ages; use products with concentrations of 20%. Safety information is available at: [ww.epa.gov/oppr001/factsheets/picaridin.pdf](http://www.epa.gov/oppr001/factsheets/picaridin.pdf).

**Tick Checks are vital.** While in tick habitat, check frequently for ticks and remove them right away.

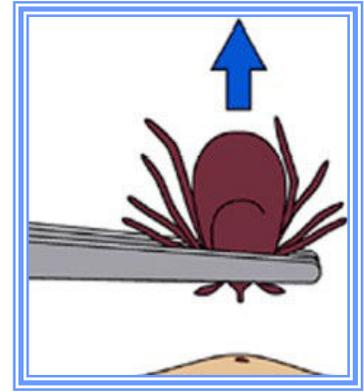
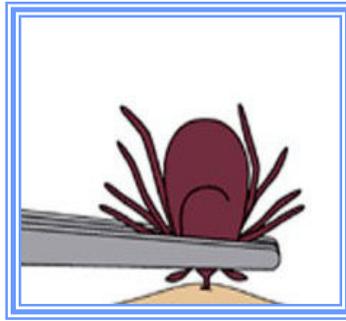
**Seek immediate medical attention if a tick bite occurs.** Discuss the pros and cons of using antibiotics to prevent Lyme disease with your physician. Physicians vary in how long they treat for prevention; refer your physician to the paper on tick bite management in the April, 2011 edition of the Wisconsin Medical Journal, available at: <http://viewer.zmags.com/publication/281912e2#/281912e2/32>.

## Tick Bite Do's and Don'ts

Do	Don't
Acknowledge "ick" factor; move on	Freak out
Carefully remove tick Save for ID	Put irritants on tick Destroy or discard tick
Wash wound Observe for rashes Call your doctor	Forget post-removal steps Guess about attachment times Take wait and see approach

## Tick Removal

1. Grasp tick close to the skin
2. Avoid squeezing body
3. Pull tick straight out



(Diagrams courtesy of CDC; accessed from [http://www.cdc.gov/ticks/removing\\_a\\_tick.html](http://www.cdc.gov/ticks/removing_a_tick.html))

## Lyme Disease Awareness

Lyme disease has several stages and causes a wide variety of symptoms. Symptoms differ from patient to patient, come and go, vary in intensity and change over time. Not all patients go through each stage.

**Early Lyme** disease develops within 2-30 days of the bite. A rash may occur at the site of the tick bite but only 70% of the cases reported to the CDC had a rash. The most common Lyme rash, called an erythema migrans (or EM), is a solid colored oval lesion. The bull's-eye rash is seen in < 20% of all EM rashes. Many patients also experience "flu" symptoms, including: fever, chills, muscle and joint pains, neck stiffness, headaches, fatigue and sore throat. In people who lack an EM, these symptoms may be the only clue of the infection; some patients have no symptoms.

**Early disseminated Lyme** disease means the bacteria has moved beyond the skin to other body sites. This usually occurs weeks to months after the tick bite. People may notice multiple EM rashes, severe headaches and stiff necks (indicating meningitis), irritation of nerves that serve the head and face, fatigue, generalized pain, difficulty concentrating and sleeping. Bell's palsy is a condition where the nerve to the muscles on one side of the face is inflamed leaving the muscles weak or even paralyzed. In Lyme-endemic areas, ¼ - ½ of Bell's palsy cases in children are due to Lyme disease. This is usually a temporary condition but it requires antibiotic treatment. A small percentage of patients may develop problems with the electrical pathways in the heart; this responds well to antibiotics.

**Late Lyme** disease develops months to years after the tick bite. Patients may develop arthritis of a single joint, most commonly the knee; nervous system problems; or non-specific complaints of fatigue, headaches, generalized pain or muscle pain, recurrent fevers, difficulty thinking and changes in mood.

Lyme disease can be a tricky diagnosis for physicians to make and lab testing is not always reliable. If you develop symptoms of Lyme disease make sure you see your physician and let him or her know you've participated in outdoor activities in areas known to have Lyme and other tick-borne diseases.



This information is courtesy of Partnership for Healing and Health, Ltd. It is intended for educational purposes only and not to replace or supersede patient care by a healthcare provider. If you suspect you have a tick-borne illness, consult a healthcare provider familiar with the diagnosis and treatment of tick-borne diseases.

PHH offers evidence-based education and programs on Lyme disease and other tick-borne illnesses for the general public and health care professionals.

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