



# Lyme Disease Awareness and Prevention

Elizabeth Maloney, MD

Lyme disease is a bacterial infection that may develop after a bite from a Lyme-infected blacklegged tick. The CDC estimates that more than 300,000 new cases of Lyme disease occur each year in the US but only a fraction of these cases are reported to public health officials.

## Lyme Awareness: Risk



EL Maloney, composite of CDC maps

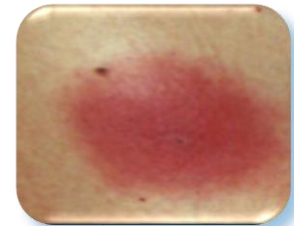
Many areas of the country are at high risk for Lyme disease. Wooded or forested regions that provide suitable tick habitat are especially at risk and breaking these areas into smaller parcels increases that risk. This map depicts where blacklegged ticks are commonly found.

People who live/work/recreate in Lyme-endemic areas or tick habitat may be exposed to disease carrying ticks in a variety of settings – campsites, parks, golf courses, sports fields, and their own back yards. Pet ownership is associated with an increased risk of Lyme disease. Age-related risk is greatest in school-aged kids and lowest in young adults.

## Lyme Awareness: Disease Basics

Lyme infections can cause a significant illness for some, producing serious and chronic symptoms that result in substantial short- and long-term disabilities. Lyme disease is multi-staged but not every patient experiences each stage. A wide variety of symptoms are possible and symptom patterns differ from patient to patient. An individual's symptoms may vary in intensity, come and go, disappear entirely or progress. These variations can make it difficult to recognize the infection.

- **Early Lyme disease** occurs within 2-30 days of a bite. In 70% of the cases reported to the CDC patients developed a rash at the site of the tick bite. Lyme disease rashes, commonly called EMs (short for the medical term "erythema migrans") are usually oval-shaped and solid-colored. The classic "bull's-eye" is seen in less than 20% of cases. Patients may also have fever, chills, muscle and joint pains, neck stiffness, headaches, fatigue and sore throat. When the EM rash is absent, these flu-like symptoms may be the only clue of the infection. Some patients are asymptomatic in early disease.



Masters E.

- **Late Lyme (or disseminated) disease** develops weeks to years after a bite. In this stage, the infection has spread beyond the skin to other body sites. Within weeks, multiple EM rashes, fatigue, muscle and joint pain, generalized pain, severe headaches and stiff necks (indicating meningitis), facial nerve palsy (weakness or paralysis of facial muscles), sleep and/or concentration difficulties may be seen. A small percentage of patients experience abnormalities in their heart rate.

Months to years after the bite patients may notice several seemingly unrelated problems including: arthritis, nervous system abnormalities or non-specific problems with fatigue, headaches, generalized pain or muscle pain, recurrent fevers, difficulty thinking or and changes in mood.

- **Persistent (or chronic) Lyme disease** is marked by persistent, recurrent and/or the development of new symptoms of Lyme disease despite prior antibiotic therapy for the infection.

## Lyme Awareness: A Tricky Diagnosis

Because symptoms are variable, lab tests aren't always reliable, and other diseases may look like Lyme disease, this can be a tricky diagnosis for doctors to make. If you spend time in tick habitat or areas known to have Lyme disease or co-infections and develop symptoms of these infections, be sure to let your doctor know about your exposures.

## Lyme Prevention: Avoid Ticks



The best way to prevent Lyme disease is to avoid ticks. Stay out of tick habitat, especially areas with long grass, lots of brush or leaf litter. Stay in the center of hiking and biking trails; don't sit on fallen logs.

Many people become infected around their home. Clear away brush and fallen leaves, keep your grass short. Place lawn furniture and play structures in sunny areas of the yard. Bird feeders and wood piles attract tick-carrying mice so keep them far from the house. Don't feed deer or use plants that attract them.

## Lyme Prevention: Use Insecticides and Repellents

Insecticides and repellents reduce the risk of a tick bite. Insecticides kill ticks; repellents encourage them to leave before biting. Look for products with one of these ingredients:

- **Permethrin** is an insecticide essential to prevention plans. Apply it to clothing, sleeping bags, tents and other gear, but not skin, before entering tick habitat. It remains effective for 2-6 weeks and through multiple washings. Permethrin-embedded clothing retains its effectiveness through 70 washings; tick gaiters are also useful. Permethrin products are sold at outdoor stores and on-line.
- **Picaridin** is a newer repellent that's as effective as DEET, use concentrations of 20%. Apply it to unbroken skin, fabrics and materials. It is non-toxic and safe for children of all ages.
- **DEET** is the best known repellent, use concentrations of 30% or higher. DEET is safe to apply to unbroken skin, wool and cotton but it can damage other fabrics and materials, such as leather or rubber. The EPA considers DEET to be safe for kids more than 2 months old but Canada's health department recommends against using DEET on children.
- **BioUD** is a newer repellent derived from wild tomato plants. A concentration of 7.75% is 2-4 times more active than 98% DEET against deer ticks. It can be used on clothing but doesn't last as long as permethrin. It's only available on-line at [www.homs.com/](http://www.homs.com/).

## Lyme Prevention: Tick Checks are Vital

Check for ticks frequently while in tick habitat and for 1-2 days after potential exposure. Promptly remove and save attached ticks in a re-sealable container so your doctor can examine them. Pets that go outdoors can bring ticks indoors; check them for ticks and use appropriate, veterinarian-approved tick products.



EL Maloney

The risk of contracting Lyme disease depends on how long the tick was attached and how likely it is to be infected. Few infected ticks transmit Lyme in less than 24 hours. At 48 hours, roughly 15% will transmit; at 60 hours, 50% pass on the infection and when infected ticks feed until full, 94% will transmit Lyme disease. In many high-risk areas, half of the deer ticks are infected with Lyme.

Deer ticks may be infected with other diseases and these infections, often called co-infections, are also transmitted through bites. Anaplasmosis, babesiosis and Powassan disease are known co-infections; bartonellosis may also be transmitted by ticks. Transmission times for *Babesia* and *Bartonella* are unknown; anaplasmosis is transmitted more rapidly than Lyme disease (in less than 24 hours).

## Lyme Prevention: Antibiotic Treatment of Deer Tick Bites

Certain antibiotics may reduce the risk of Lyme disease if taken within 2 days of a bite. Contact your doctor immediately after a bite to discuss this strategy. Following a "wait and see" strategy is risky because 30% of patients never develop a Lyme rash. Basing treatment decisions on blood tests done shortly after a bite isn't a good idea because the results are unreliable. Antibiotic approaches are changing; ask your doctor to review this paper published in April, 2011 in the Wisconsin Medical Journal and available at: [www.wisconsinmedicalsociety.org/WMS/publications/wmj/pdf/110/2/78.pdf](http://www.wisconsinmedicalsociety.org/WMS/publications/wmj/pdf/110/2/78.pdf).