



(Courtesy of IGeneX)

## LYME DISEASE PREVENTION

The best way to avoid becoming infected with Lyme disease is to avoid being bitten by a blacklegged tick. Ticks crawl; they do not fly, jump or drop out of trees. Ticks are generally found in tall grass or leaf litter, usually no more than 3 feet above the ground. Avoid walking through these areas whenever possible. In some parts of the country ticks are active year-round but most bites occur during the warmer months of the year.

When tick habitat can't be avoided, several strategies can be used to reduce the risk of infection. Walk in the middle of trails to avoid ticks which may be in the brush next to the trail. Wearing light-colored clothing makes it easier to spot these dark-colored ticks before they can bite.

Pretreating outdoor clothing and gear with permethrin is the most effective way to avoid being bitten. Permethrin is an insecticide and kills ticks on contact. Clothing can be treated at home with sprays or dips that are effective for 2-6 weeks (and last through multiple washings). Permethrin, when wet, is toxic to cats and aquatic life so take the necessary precautions to avoid harm. Once dried into the clothing or gear, there is no longer any risk. Some manufacturers sell permethrin treated clothing or treat clothing and gear sent in by customers. When factory treated, these items will kill ticks through 70 washings.

Tick repellents are a must. Choose one containing picaridin, DEET, IR 3535 or oil of lemon eucalyptus. All are effective if properly applied and reapplied while in tick habitat; follow the manufacturers' directions.

Pets and companion animals that spend time outdoors should also be treated with appropriate insecticides and repellents. Many of these products are species-specific, check with a veterinarian before using them.

It is important to perform frequent and careful tick checks (looking and feeling all over your body) during and after exposure to tick habitat. This applies to pets, too, because even treated animals can bring ticks indoors. Be systematic and use mirrors or a buddy to check hard to see areas. Remember that these ticks are small (see photo showing actual tick sizes) so it will take more than a quick glance to find them. Putting outdoor clothing in the dryer on high heat will kill ticks that may be on them. Dry clothing needs only 6 minutes but wet clothes need a full hour.



If an attached tick is found, it's important to remove it promptly and properly. The longer a tick is attached, the greater the risk of infection. Use fine-pointed tweezers or a tick removal tool. DO NOT apply liquids, gels or heat to the tick; these actions rarely cause it to release and may make removal more difficult. Grasp the tick at the skin line, and gently pull straight out at a 90° angle. If possible, avoid squeezing the tick because this may increase the risk of infection.

Seek medical advice for all tick bites. Many doctors prescribe antibiotics to reduce the risk of Lyme disease. The decision often depends on where in the country the bite occurred, whether there was evidence that the tick had begun feeding and the age of the person who was bitten. Based on the limited scientific evidence, and provided it is safe to do so, ILADS recommends a 20-day course of doxycycline. If Lyme disease symptoms appear after a bite (whether or not it was treated) call a doctor right away. Prompt treatment is important for full recovery.

## RESOURCES

For Lyme-related questions or help finding a doctor, visit ILADS' website, [www.ilads.org](http://www.ilads.org), or email us at [contact@ILADS.org](mailto:contact@ILADS.org).

# LYME DISEASE: A BACTERIAL INFECTION



**LYME DISEASE** is an increasingly common bacterial infection that is acquired from the bite of an infected blacklegged (deer) tick. Most cases occur in the Northeastern, Upper Midwestern and western coastal states but cases of Lyme disease have been reported in all states.

Most people who become infected with Lyme disease do not recall a tick bite. Symptoms of early Lyme disease are likely to appear between 2 and 30 days after a tick bite. The best-known symptom of early disease is the erythema migrans or EM rash, which can occur at the site of the tick bite. Sometimes multiple rashes are present. Untreated EM rashes expand and clear over days to weeks. EM rashes are usually solid colored, ranging from faint pink to a deep red. Less than 20% of all EMs have the classic “bull’s-eye” appearance. These photos are examples of EMs. Individual EM rashes may have a different appearance (photographing suspicious rashes can help doctors determine if Lyme disease is a likely possibility).

It is unclear how many people with Lyme disease develop an identifiable EM rash. CDC surveillance case data documents that ~ 30% of confirmed cases lack a reported rash. An EM rash is diagnostic of Lyme disease, meaning that people who have the rash have Lyme disease. Because blood tests may be falsely negative in early Lyme disease, testing is not recommended. Antibiotic treatment should begin as soon as an EM is identified.



(Courtesy of CDC)



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Early Lyme disease may present as a “summertime flu”, producing fever, fatigue, muscle or joint pain and headache with or without an EM rash. Some people may notice areas of numbness or tingling that can move from one area to another.

### LYME DISEASE: SYMPTOMS and SIGNS of LATE DISEASE

A Lyme infection can affect any system of the body, causing a wide array of symptoms. The infection can produce debilitating fatigue, headaches, muscle pain, arthritis in any joint, neurological symptoms such as numbness, tingling, nerve pain and weakness, heart problems, psychiatric disorders, difficulty with thinking, memory, language and math skills, as well as problems with vision, and hearing. Given the variety of potential problems, it’s not surprising that cases of Lyme disease don’t all look exactly alike.

While the infection is often mild, some people may have a severe illness and associated disabilities. Left untreated, or under-treated, Lyme disease can persist for years. Although rarely fatal, deaths have occurred, especially if the heart is involved.

### LYME DISEASE: DIAGNOSIS

Lyme disease is often a clinical diagnosis, based on a person’s exposure to ticks, their symptoms and their physical examination findings. Because symptoms and findings may differ from patient to patient, making the diagnosis can be difficult. Commercial lab tests for Lyme disease are unreliable and insensitive, missing a substantial number of actual cases. Negative test results do not rule out Lyme disease.

### LYME DISEASE: TREATMENT

Antibiotics are used to treat Lyme disease. ILADS’ treatment guidelines recommend 4-6 weeks of doxycycline, amoxicillin or cefuroxime for cases of early Lyme disease. This should be effective for the majority of people. Treatment may be extended if symptoms remain. If not treated promptly and sufficiently, Lyme disease may become persistent and longer courses of antibiotics may be necessary. Treatment failures have been documented even in the best circumstances. It is important for treatment to be individualized and carefully monitored. Symptoms that change over time or do not resolve should be reported to the treating physician, who may need to consider other treatment regimens and diagnoses.



(Courtesy of CDC)

### OTHER TICK-BORNE DISEASES

Blacklegged ticks often carry multiple bacteria, viruses and parasites that can be transmitted individually or along with Lyme disease bacteria. It is not unusual to get more than one infection from a single tick bite. Potential infections include babesiosis, anaplasmosis, ehrlichiosis, bartonellosis, and others. Some of these diseases do not respond to the antibiotics commonly used to treat Lyme disease. Each infection must be appropriately treated in order for a person to get well.