# Lyme Disease 24

An educational service of NetCE

## Ask Your Patients...

"Do you spend a lot of time in wooded or grassy areas?"

## If Your Patient Asks...

"Should I be concerned about my tick bit?"

## UNDERSTAND the problem

Lyme disease is a relatively common tickborne infectious disease, especially in certain parts of the United States. The primary agent of Lyme disease is the spirochetal organism *Borrelia burgdorferi*; however, in the United States, there are at least one other bacteria (*Borrelia mayonii*), two other known genospecies, and as many as 40 disease-causing subspecies of *Borrelia*.[1; 2; 3]

Lyme disease is the leading arthropod zoonosis reported in the United States.[4] In 2018, state health departments reported 33,666 confirmed or probable cases of Lyme disease to the CDC.[4] The geographic distribution of high incidence areas has expanded over the past decade.

## WHAT are the signs and symptoms

Humans can have varied and severe reactions to Lyme disease; most organ systems have the potential to be affected. The first signs of Lyme disease are usually flu-like symptoms and joint pain. Three distinct stages have been described in patients with untreated infections.[5]

Stage 1 (early localized stage) occurs 3 to 30 days after the tick bite and is associated with the appearance of the characteristic "bull's-eye" skin lesion of erythema migrans. This initial stage may show the nonspecific clinical signs of malaise, headache, arthralgia, fever, myalgia, and regional lymphadenopathy.

Stage 2 (early disseminated stage) is evident after days to weeks post-tick bite.[4; 6] Possible manifestations include subtle encephalitis with headache and cognitive difficulty, stiff neck, cranial neuropathy (with facial palsy being a common finding), cerebellar ataxia, motor and sensory radiculoneuritis, myelitis, and visual disturbances.

## WHO is at risk

All persons who spend time in wooded or grassy areas (even their own yards or neighborhoods) are at risk for tick bites. This risk is heightened in persons who spend significant time outdoors (e.g., those who camp, hike, or work in these areas). People living in or visiting New England, the mid-Atlantic states, and the upper Midwest are at greatest risk for contracting Lyme disease from an infected tick. Infected ticks can also be found in neighboring states and in some areas of Northern California, Oregon, and Washington.

Although there is a year-round occurrence of Lyme disease, the ticks are most active in the spring and fall, when the ambient daytime temperature is in the 50s and the ticks have reached the maturation stage and must seek their final host. New cases cluster around the months after the spring and fall tick activity periods.

Stage 3 (late disseminated stage) is the chronic phase, which may appear months to years after the initial infection.[4] One of the most common findings in this stage is oligoarthritis, with the knee being the most frequently affected joint.[4; 6] Musculoskeletal pain, spinal radiculopathy with paresthesias, encephalopathy, and the symptom complex of fibromyalgia or chronic fatigue syndrome may be present. This stage is associated with chronic borreliosis; consequently, cardiac arrhythmias, respiratory compromise, and spread to the entire nervous system are liable to occur.

## HOW is it treated

Prompt and complete treatment of early Lyme disease with antibiotics is important to prevent the development of chronic Lyme disease and/or chronic neuroborreliosis and their troublesome sequelae. The International Lyme and Associated Diseases Society suggests that Lyme disease should be treated with doxycycline as the antibiotic of choice for prophylaxis following an Ixodes tick bite with known feeding, irrespective of the amount of tick engorgement or the local tick population infection rate.[7] Where doxycycline is contraindicated, antibiotics known to be effective for treating Lyme disease, such as amoxicillin, azithromycin, or cefuroxime, may be substituted. The recommended adult dose and prophylactic regimen is 100–200 mg doxycycline twice daily for 20 days.[7]

As with any disease, prevention is the best solution. Educating people about how the disease is transmitted and its early signs will help reduce the overall incidence and lessen the severity in those who receive early treatment.

## WHERE to find resources

**Centers for Disease Control and Prevention**
https://www.cdc.gov/ticks/tickbornediseases/TickborneDiseases-P.pdf

**Global Lyme Alliance**
https://globallymealliance.org

**Lyme Disease Foundation**
https://lyme.org

**International Lyme and Associated Diseases Society**
https://www.ilads.org

**Lyme Disease Association, Inc.**
https://lymediseaseassociation.org

**American Lyme Disease Foundation, Inc.**
https://www.aldf.com

**National Institute of Allergy and Infectious Disease**
https://www.niaid.nih.gov/diseases-conditions/lyme-disease


1 Grier T. Will There Ever Be An Accurate Test for Lyme Disease? Available at https://owndoc.com/pdf/when-accurate-lyme-tests.pdf. Last accessed September 8, 2020.

2 Lin T, Oliver JH Jr, Gao L, Kollars TM Jr, Clark KL. Genetic heterogeneity of Borrelia burgdorferi sensu lato in the southern United States based on restriction fragment length polymorphism and sequence analysis. *J Clin Microbiol.* 2001;39(7):2500-2507.

3 Centers for Disease Control and Prevention. New Lyme-Disease-Causing Bacteria Species Discovered. Available at https://www.cdc.gov/media/releases/2016/p0208-lyme-disease.html. Last accessed September 8, 2020.

4 Centers for Disease Control and Prevention. Lyme Disease Data and Surveillance. Available at https://www.cdc.gov/lyme/datasurveillance/index.html. Last accessed September 8, 2020.

5 Steere AC, Coburn J, Glickstein L. The emergence of Lyme disease. *J Clin Invest.* 2004;113(8):1093-1101.

6 Depietropaolo DL, Powers JH, Gill JM. Diagnosis of Lyme disease. *Am Fam Physician.* 2005;72(2):297-304.

7 Cameron DJ, Johnson LB, Maloney EL. Evidence assessments and guideline recommendations in Lyme disease: the clinical management of known tick bites, erythema migrans rashes and persistent disease. *Expert Rev Anti Infect Ther.* 2014;12(9):1103-1135.


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