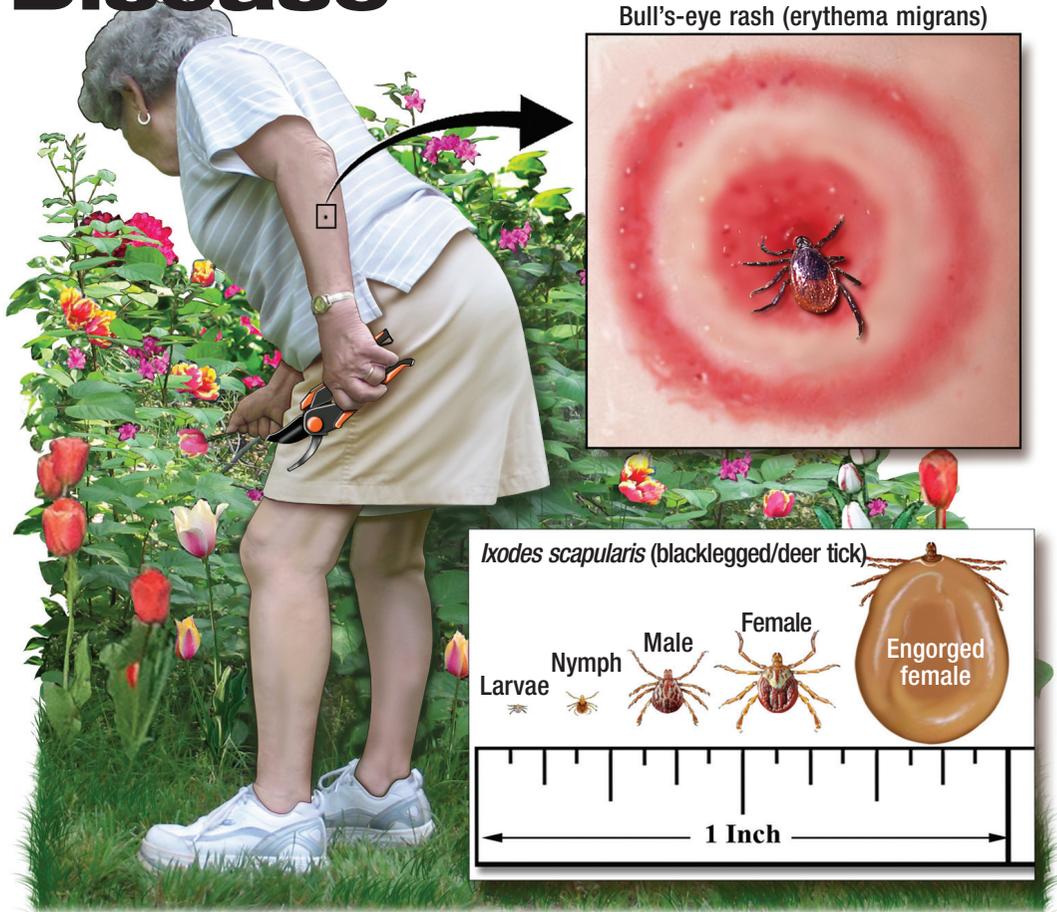


Lyme Disease



Infection Transmitted By Ticks

Lyme disease is a bacterial infection first described in 1975 in Old Lyme, Connecticut. It is caused by *Borrelia burgdorferi*, which is spread to humans through the bite of an infected blacklegged or deer tick. The transfer of bacteria occurs when a tick bites an infected deer or mouse, then attaches to human skin and feeds over a period of 1 to 3 days.

Lyme disease, if recognized and treated with antibiotics, is a curable infection. The disease progresses in stages, with stage 1 beginning a few days or weeks after an infected tick bite. Early symptoms resemble the flu, with muscle aches, headache, and fever. It is during this early stage that the characteristic "bull's-eye" rash often appears as a red rash with a clear ring, with or without itching. If left untreated, stages 2 and 3 disease can lead to joint, heart, and nerve problems over a period of weeks, months, and even years.

If a tick is found attached to the skin, it should be removed by pinching the head with tweezers and pulling straight up. The area of the tick bite should be watched for several weeks for signs of a bull's-eye rash or early symptoms of Lyme disease. If symptoms occur, treatment includes 2 to 4 weeks of antibiotics as well as nonsteroidal anti-inflammatory drugs (NSAIDs) for pain and stiffness in the muscles and joints.

Lyme disease is preventable by using tick repellent on skin and clothes when walking in wooded or grassy areas. After exposure to outdoor areas where ticks may thrive, skin and scalp should be checked thoroughly for attached ticks.

Curable With Antibiotic Therapy If Diagnosed Properly

Humans are infected with *Borrelia burgdorferi* through transmission by an infected tick bite, usually from the blacklegged or deer tick. Lyme disease is not transmitted by person-to-person contact or through the bite of any other insect. Infected ticks are only found in a limited number of places in the United States, predominantly in the Northeast, although cases have been reported in all 50 states. Human exposure to ticks primarily occurs in grassy or wooded areas while hiking, hunting, or working outdoors.



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Stages of Lyme Disease

Symptoms of Lyme disease appear over a period of time in three stages. Stage 1, *early localized Lyme disease*, usually begins within a few days up to a few weeks after the tick bite. The symptoms resemble the flu, with fever, chills, headache, and muscle aches. In about three-fourths of the cases, a “bull’s-eye” rash, known as *erythema migrans*, appears as a red circle that spreads up to 12 inches in diameter with a clear circle near the center.

Stage 2, *early disseminated Lyme disease*, develops in untreated cases several weeks or even months after an infected tick bite. The spread of the bacteria throughout the body causes symptoms such as muscle or joint pain and swelling, weakness in muscles of the face, and heart problems such as skipped beats.

Stage 3, *late disseminated Lyme disease*, occurs months or even years after an infected tick bite causes an infection that is not treated. In addition to the muscle and joint pain of stage 2, symptoms of stage 3 disease include abnormal muscle movements, numbness, speech and vision problems, difficulty sleeping, and poor memory.

Diagnosis and Treatment

Lyme disease is diagnosed using the history of tick exposure, physical examination findings, evaluation of symptoms, and laboratory testing. Not surprisingly, many people who develop Lyme disease cannot recall being bitten by a tick. Laboratory testing begins with a blood test to look for antibodies to *B burgdorferi*, which may not appear in the blood until several weeks after the bacterial infection has occurred. A second blood test (sometimes referred to as a *Western Blot test*) can be used to confirm results from the initial test if necessary.

A confirmed case of Lyme disease is treated with an oral antibiotic. The recommended antibiotics include doxycycline, amoxicillin, or cefuroxime axetil. Doxycycline is not approved for use in children younger than 8 years and is contraindicated in pregnant or nursing women. Alternative antibiotics such as azithromycin, clarithromycin, or erythromycin can be used in patients who cannot take the recommended agents. The exact antibiotic and duration of treatment depend on the stage of Lyme disease being treated. Patients with rare but serious complications such as meningitis or heart inflammation are treated with IV antibiotics. Nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen help relieve muscle and joint stiffness and pain.

In most cases, Lyme disease symptoms disappear with antibiotic therapy, although a small percentage of patients will continue to have symptoms even after treatment, which is known as *post-Lyme disease syndrome*. This may be caused by a continued reaction by the immune system for unknown reasons. Further treatment with antibiotics is not effective in these patients.

Lyme disease is completely curable with antibiotic therapy. However, one episode of Lyme disease does not protect against future infections with *B burgdorferi* bacteria. If you have questions about tick bites, Lyme disease, antibiotics used to treat the disease, or tick repellents, your pharmacist can help.