

Lyme Disease

Fast Facts

- Lyme disease spreads only by a tick bite. Though the bite may go unnoticed, the infection usually starts with a painless, spreading rash where the tick had attached itself to the skin.
- Noticing the early signs of Lyme disease and getting prompt treatment when they occur greatly reduces the severity and length of symptoms.
- Even when the infection is found much later, antibiotic treatment is still successful for most people.



Lyme disease is an infection spread by the bite of infected blacklegged ticks. In the northeastern, mid-Atlantic, and north-central United States, it is spread by *Ixodes scapularis*, or deer tick, and in the Pacific coast, it is spread by the western blacklegged tick (*Ixodes pacificus*).

If caught and treated early, the infection most often clears quickly. If not found until the later stages of infection, people with Lyme disease are more likely to have symptoms.

Lyme disease results from the spread of *Borrelia burgdorferi* bacteria living inside infected ticks. These small ticks can attach to human skin and go unnoticed, feeding for a few days. During that time, the bacteria pass from the tick into the person, before the tick dislodges. Other infections spread by ticks may occur at the same time (co-infection) or separate from Lyme disease. These also require prompt medical care.

⊕ What is Lyme disease?

Lyme disease is an infection resulting from the bacteria, *Borrelia burgdorferi*, which enter the body when certain infected ticks bite. There are three stages of infection.

In the **early localized stage**, a rash, called erythema migrans, appears at the site of the tick bite from three days to a few weeks later. The rash starts as a small red mark and over days slowly grows to at least two inches wide. It can spread to 10 or more inches, sometimes with a ring or bull's-eye shape.

Most often, the rash does not hurt or itch. About 10 – 25% of the time, the rash where the tick bit goes unnoticed. If left untreated, the infection may spread to other parts of the body in days to weeks. This is called the **early disseminated stage**. The person infected may have many signs and symptoms, including:

- More than one rash
- Fever
- Joint pain and muscle pain
- Headache

In about 20% of cases, the infection can attack the nervous system. This can cause very bad headache and stiff neck, paralysis of the muscles of the face or painful inflammation of nerves. If the infection reaches the heart, as it does in about 5% of cases at this stage, the heartbeat may slow too much (known as heart block). Some people will have no symptoms.

The **late stage** may occur months to even years after the bite, mostly in those who did not get early treatment. At this stage, the infection can affect the joints (Lyme arthritis), causing pain and swelling of one or both knees. Less often, Lyme arthritis can involve other, mostly large, joints.

Late-stage infection rarely can also harm the nervous system. It may affect the peripheral nerves (nerves outside the brain and spinal cord), leading to numbness or tingling or, less often weakness. If the infection affects the brain, it may lead to trouble with memory and concentration.

+ Who gets Lyme disease?

In the United States, Lyme disease occurs mostly in the Northeast and Middle Atlantic states from Virginia northward, the upper Midwest and, to a lesser degree, in Northern California and the Pacific Northwest. The illness is named after the town of Old Lyme, Connecticut, where the first cases of Lyme disease were found in 1975.

People most at risk are those who spend time outdoors in rural or suburban sections of these regions, mainly at certain times of the year. More infections occur in the late spring and early summer. Those times are when the tiny (poppy seed sized) immature form of the tick (nymph) is feeding. A second, smaller wave of Lyme disease occurs in the fall and in early to mid-spring when the larger (sesame seed sized) adult tick feeds. The risk of tick bites is lower during the late summer after the nymph ticks become inactive, and in the winter. Cold weather (below about 50 degrees F) and snowfall make the adult ticks dormant.

+ How is Lyme disease diagnosed?

Rheumatologists are doctors who are experts in diagnosing and treating diseases that can affect joints and muscles, including infections such as Lyme disease. Primary care physicians and infectious disease doctors also diagnose and treat people with Lyme disease.

The most accurate way to detect Lyme disease is with a two-stage blood test. The first is a screening test called an enzyme-linked immunosorbent assay (often referred to as ELISA) that looks for certain antibodies (immune proteins) that are the immune system's response to the infection. This screening test is prone to false positive results, so a second test, a Western blot, is often done to confirm positive (abnormal) or borderline positive ELISA results.

Sometimes, these lab tests are wrong. A person who does not have Lyme disease may have a false positive on a blood test, or someone who has Lyme disease may have a normal result, which is called a false negative. (A false negative is common in the early weeks of the infection, but at later stages is rare.) Therefore, only patients who show possible symptoms of the disease should get lab tests for Lyme disease.

+ How is Lyme disease treated?

Treatment of Lyme disease is with certain antibiotics. In most cases, early-stage Lyme disease is treated successfully with two to three weeks of oral (by mouth) antibiotics. Most cases of early-stage Lyme disease need just two or three weeks of antibiotics, most experts agree. However, patients with arthritis (swelling of a joint) need longer treatment (four weeks) with oral antibiotics. If arthritis persists, they may need a second four-week course of oral or intravenous (often called IV) antibiotics. Infection involving the nervous system or heart also may require IV antibiotics.

Even when antibiotic treatment does not start until the later stages, it is still successful in most patients. However, early detection and treatment are important. People are more likely to have lingering symptoms after treatment if they do not get treatment promptly. These symptoms include fatigue, poor sleep, and muscle and joint pain. The name for this set of ongoing symptoms is post-Lyme disease syndrome.

The cause of post-Lyme disease syndrome is not known. Symptoms are similar to those that can occur after other infections and stressors to the body. Treatment with more antibiotics beyond the first standard treatment has not been proven to be of benefit. Only people with ongoing active infection (which is rare after earlier recommended antibiotic treatment) should receive additional antibiotic treatment. Most people with this syndrome will improve over time.

+ Preventing Lyme disease

Ticks do not jump. Instead, they must brush onto a person after direct contact. To reduce the risk of Lyme disease:

- Avoid ticks' favorite habitats. These include tall grass, leaf-covered ground, and brush. Instead, stay on open paths, cut grass or sand.
- Dress properly. Wear light-colored clothing to make it easier to see ticks on you. When possible, wear closed shoes and long pants. Tuck the hems of long pants into socks to block skin access.
- Use repellants and insecticide. Spray your skin and clothes with repellants containing DEET when outdoors. Clothes (not skin) may be treated with the insecticide permethrin for more prolonged exposures – take care to follow all directions on the container if this is used.