



The Lowdown on Lyme Disease

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Many people have heard and fear the diagnosis of Lyme disease due to all the negative complexities associated with the illness. It is called Lyme disease because the first case was discovered in 1977 in Old Lyme, Connecticut. There are over 300,000 new cases of Lyme disease diagnosed each year in the United States, with the most cases reported in the Northeast and upper Midwest. Lyme disease is caused by *Borrelia burgdorferi*, a spirochete bacterium, which is transmitted to humans by bites from the black-legged tick, also called the deer tick (species *Ixodes scapularis*).

Black-Legged Ticks Now Established in Nebraska

Until recently, Nebraska did not have established populations of *Ixodes scapularis*, and past cases of Lyme disease were considered rare and attributed to ticks from out of the state, either by traveling people or wildlife. In June 2019, state health officials identified established populations in Douglas, Sarpy and Saunders Counties. It is now important for Nebraskans to understand Lyme disease and how to avoid acquiring it.

About Ticks

Vector-borne diseases are transmitted by specific organisms, and Lyme disease, is transmitted by ticks. Ticks are arachnids, not insects. They are wingless, tough and leathery and always parasitic. Ticks can be found in the environment

Black-Legged Tick Identification and Size

- Larvae have only six legs and are called seed ticks and are extremely tiny (1/32-inch long).
- Nymphs are the size of a poppy seed (1/16-inch long) with eight legs.
- Adult ticks can be up to 1/8-inch long.
- Unfed females have orange-red body with black scutum.
- When engorged, black scutum and legs.



Jim Oci, BugPics, Bugwood.org

where wildlife inhabit, and as their common name implies, it is associated with white-tailed deer populations. High tick season in Nebraska is generally April and May for American dog ticks and lone star ticks, but the black-legged ticks are most active from October to March, when temperatures are above freezing. This means, Nebraskans must practice tick safety throughout the year.

Ticks undergo three life stages: Larva, nymph and adult, where each stage requires a blood meal from a host, before it drops off to molt to the next stage. Each of these life stages allows the tick the opportunities to pick up the bacteria that causes Lyme disease. Larval ticks are not infected when they emerge from eggs, which means they must acquire it from an infected host whether it is a mouse, chipmunk or squirrel.

When a tick attaches to a host, it must prepare itself to feed, and so there is a delayed time of approximately 36 hours when it can transmit the bacteria in its saliva. The bacteria only remains

localized for a short time before it goes through blood and tissue before disseminating throughout the body. This is why blood draws are not effective at detecting Lyme disease like other illnesses. Ticks themselves, can be tested for Lyme disease, so it is important to keep ticks that have been removed from the body for pathogen testing.

Signs and Symptoms of Lyme Disease

Early (3–30 days after tick bite) symptoms and signs of Lyme disease include fever, headache, fatigue, muscle and joint aches and swollen lymph nodes. In 70–80% of infected persons, a bullseye rash, called Erythema migrans, develops on the skin. The rash, if it occurs, will be evident after seven days and gradually expands reaching up 12 inches or more. The rash can appear anywhere on the body, feels warm to the touch, but is not normally itchy or painful. Symptoms of Lyme disease

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may be similar to symptoms associated with chronic illnesses such as multiple sclerosis, arthritis and fibromyalgia.

It is important to remember that skin irritations and rashes can occur from reactions due to bites from different organisms (for example, mosquitoes or chiggers), other species of ticks (for example, lone star tick) or different illness (for example, southern tick-associated rash illness or Rocky Mountain spotted fever). Signs and symptoms alone cannot be used to diagnose Lyme disease.

Medical Testing

Testing for Lyme disease is a two-tiered test which requires serologic testing which can be complicated and take considerable time to get and interpret accurate and positive results. Detecting the bacteria in the blood is difficult because it disseminates into the tissues of the body. This is why it is easier to test the tick rather than test the patient.

This is also why physicians must be notified that the patient was bit by a tick so they can order the proper series of tests. The first test measures a person's antibody to *Borrelia burgdorferi*, and positive results require an immunoblot

test. To learn more about medical testing, go to <http://dhhs.ne.gov/han%20Documents/ADVISORY042319.pdf>.

Treatment

Treatment for Lyme disease requires antibiotics in the early stages and the majority of infected people recover rapidly and completely. The most common oral antibiotics include doxycycline, amoxicillin or cefuroxime axetil. The dose and schedule of treatment varies based on a person's age, medical history and various health conditions, and whether symptoms reflect early or late Lyme disease. Chronic Lyme disease is a controversial topic and refers to an illness in which patients suffer long-term symptoms like fatigue, pain and joint pains after being treated for Lyme disease. Medical professionals call this Post-treatment Lyme disease syndrome (PTLDS) and more information can be found on the CDC website at www.cdc.gov/lyme.

Tick Safety and Disease Prevention

The best way to prevent contracting Lyme disease is to prevent tick bites. Ticks find a host by "questing" from the ground about knee-height and when

they find a suitable host, they move upward to warm areas. When ticks feed on humans, they often embed in the groin area, armpit, behind the knees, ears and on the scalp.

Ways to protect against tick bites include:

- Frequent tick checks of people and pets during activities and coming inside or into vehicle.
- Wearing permethrin-treated clothing.
- Use of EPA-approved skin repellents such as DEET and picaridin.
- Drying outdoor clothing in clothes dryer for 30 minutes on high to kill hitchhiking ticks.
- Showering and performing thorough tick check.
- Removing ticks by grasping them as close to the skin as possible with tweezers and pulling straight out. (Keep tick for identification and possible testing).

To Test Ticks

University of Massachusetts Laboratory of Medical Zoology offers reliable tick testing. For more information, go to https://tickencounter.org/tick_testing.