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# What is Lyme disease?

Lyme disease is a tick-borne illness caused by infection with the bacteria *Borrelia burgdorferi*, and was first diagnosed in the town of Old Lyme, Connecticut. The Lyme disease agent is transmitted to persons only through the bite of an infected blacklegged tick. Lyme disease is the most common tick-borne illness in Virginia.

# Who can get Lyme disease?

People of any age can get Lyme disease, but the illness is most common in persons under 16 years of age or persons older than 30 years of age. Anyone who spends time outdoors, particularly in suburban forested environments where tick populations are typically the highest, is at greater risk of exposure; the peak transmission season occurs in May and June, but may potentially occur throughout the year.

# What are the symptoms of Lyme disease?

Most patients (>75%) will see the development of a red rash called an erythema migrans ("EM" rash) or a "bull's-eye" rash around a tick bite site within days or weeks the tick bite. This rash expands up to 12 inches in diameter, and often clears around the center. The rash does not itch or hurt, so it may not be noticed if it is on a person's back-side or scalp. The initial illness may cause fatigue, fever, headache, muscle and joint pains, and swollen lymph nodes.

# How soon after exposure do symptoms appear?

The EM rash can appear from 3 to 30 days after tick exposure (usually by seven days); other symptoms begin to appear at the time of the rash.

# How is Lyme disease spread?

The bacteria that causes Lyme disease is only transmitted through the bites of infected blacklegged ticks (a.k.a., deer ticks). Blacklegged ticks have four life stages (egg, larva, nymph, and adult), but the tiny nymphs cause most cases of infection because they are active in the late spring and summer when people are more active outdoors. Blacklegged tick nymphs are very small and their bites cause very little or no itch or irritation, which is why most people never realize they have been bitten unless the tick attaches to a part of the body that is in plain sight. Lyme disease is not transmitted from one person to another.

# What can happen if Lyme disease is not treated in the initial

## stage?

If untreated or improperly treated in the early stage of illness, some patients may develop one or several of the following symptoms: multiple EM rashes on their body, intermittent arthritis (pain and swelling) especially in larger joints (e.g., knees), facial palsy, heart palpitations, severe headaches/neck stiffness (due to inflammation of spinal cord), or neurological problems including shooting pains or numbness and tingling in the hands and feet (radiculoneuropathy), or memory problems months to years after the initial illness. Pain and swelling in large joints will occur in about 60% of untreated patients, and neurological symptoms occur in about 5% of untreated patients. Arthritis and neurological problems may last for several years after the infection.

## How is Lyme disease diagnosed?

The diagnosis of Lyme disease is based primarily on the patient's signs and symptoms of illness. Laboratory tests for Lyme disease antibody may be done on a patient's blood to confirm the diagnosis, but if blood is collected too early in the course of illness, an infected person may not have developed a detectable antibody response. If laboratory confirmation is desired, re-testing may be necessary.

## How is Lyme disease treated?

When Lyme disease is detected early and treated with an appropriate antibiotic (e.g., doxycycline), it can be easily cured.

## How can Lyme disease be prevented?

There is currently no vaccine available for Lyme disease prevention. Avoiding the bites from blacklegged ticks and, if bitten, promptly removing attached ticks are the only ways to prevent Lyme disease. Blacklegged ticks live in shady forest habitats and in forest leaf litter, but may also be found in grass along shady forest edges, or in any vegetation that is shaded by trees. When working or playing in these habitats, wear light-colored clothing and tuck pants into socks and shirts into pants; wear clothing, shoes, and socks that have been treated with permethrin repellents (do not use permethrin directly on exposed skin). Apply other repellents (containing active ingredients such as DEET, Picaridin, oil of lemon eucalyptus, Bio-UD, or IR3535) to exposed skin such as at the elbows of your arms. If you are wearing shorts, apply repellents to the skin on your legs at and below the knees. Always follow the guidance provided on product labels. Shower with soap and hot water and check body surfaces carefully to remove  ticks as soon as possible after spending time in tick habitats.

## How should a tick be removed?

Remove attached ticks as soon as possible. Lyme disease transmission increases with the amount of time a tick has been attached (typically requires an attachment time of at least 30 hours). Use fine-tipped tweezers to grab the tick's head as close to the skin as possible and exert a steady pull until

the tick lets go on its own. Do not jerk, twist, or squeeze the tick's body when removing it as this can increase the risk of infection. Identifying what species of tick was attached provides knowledge about the diseases it might have carried. Therefore, it is important to save the tick for identification by placing it in a jar or plastic bag. You can then preserve the tick by adding alcohol or freezing the tick so it can be easily identified in the event any illness signs or symptoms develop in the days or weeks after tick attachment.

## How can I learn more about Lyme disease?

- If you have concerns about Lyme disease, contact your local healthcare provider.
- Call your local health department. A directory of local health departments is located at the VDH Local Health Districts page.
- Visit the Centers for Disease Control and Prevention website at the CDC page on Lyme disease.

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