



BASIC INFORMATION

WHAT IS LYME DISEASE?

- A bacterial infection spread through the bite of the black legged tick

WHAT ARE COMMON SIGNS AND SYMPTOMS?

- Early localized Lyme disease (Stage 1) symptoms begin days or weeks after infection and are similar to the flu
 - Body-wide itching, chills, fever, general ill-feeling
 - Headache, lightheadedness or fainting
 - Muscle pain, stiff neck
 - There may be a rash in the shape of a "bull's eye," a flat or slightly raised red spot at the site of the tick bite with a clear area in the center
 - Image to the right illustrates the characteristic "bull's eye" rash (erythema migrans) seen in approximately 80% of persons infected with Lyme disease
 - The spot can become quite large
- Symptoms of early disseminated Lyme disease (Stage 2) may occur weeks to months after the initial tick bite:
 - Paralysis or weakness in the face muscles
 - Muscle pain, pain or swelling in the knees and other large joints
 - Heart problems, such as skipped heartbeats (palpitations)
- Late disseminated Lyme disease (Stage 3) symptoms can occur months or years after the initial infection:
 - The most common are muscle and joint pain
 - Abnormal muscle movement
 - Muscle weakness
 - Numbness and tingling
 - Speech problems



Courtesy of PEPID LLC

WHAT CAUSES LYME DISEASE?

- Caused by bacteria called *Borrelia burgdorferi* (*B. burgdorferi*)
- The ticks pick up the bacteria when they bite mice or deer that are infected with Lyme disease
 - Image to the right illustrates the adult deer tick, *Ixodes scapularis*
- You get the disease if you are bitten by an infected tick

WHAT INCREASES MY RISK?

- Doing outside activities that increase tick exposure (for example, gardening, hunting, or hiking) in an area where Lyme disease is known to occur
 - Northeastern states, from Virginia to Maine
 - North-central states, mostly in Wisconsin and Minnesota
 - West Coast, particularly northern California
- Having a pet that may carry ticks home
- Walking in high grasses



Image of Adult Deer Tick courtesy of Scott Bauer, Agricultural Research Service, the research agency of the United States Department of Agriculture [Public Domain] Available at: https://commons.wikimedia.org/wiki/File:Adult_deer_tick.jpg

WHAT ARE POSSIBLE COMPLICATIONS?

- Stage 3 (late disseminated) Lyme disease can cause long-term joint inflammation (Lyme arthritis) and heart rhythm problems
- Brain and nervous system problems are also possible such as:

- Decreased concentration
- Memory disorders
- Nerve damage
- Numbness
- Pain
- Paralysis of the face muscles
- Sleep disorders
- Vision problems

WHAT CAN I EXPECT?

- Often, a tick must be attached to your body for 24-36 hours to spread the bacteria to your blood
 - Blacklegged ticks can be so small that they are almost impossible to see
 - Many people with Lyme disease never even saw a tick on their body
- Most people who are bitten by a tick do not get Lyme disease
- Symptoms may come and go
- If diagnosed in the early stages, Lyme disease can be cured with antibiotics

HOW DO I REDUCE MY RISK?

- Avoid direct contact with ticks, especially during warmer months
- Avoid wooded, bushy areas, areas with high grasses and leaf litter
- Walk in the center of trails
- Check yourself, your children, your pets frequently during and after your walk or hike
- When walking or hiking in wooded or grassy areas, spray all exposed skin and your clothing with insect repellent
- You may also treat clothing, such as boots, pants, and socks, with a product that contains permethrin
 - It remains protective for several washings
- Ticks carrying the disease are very hard to see
 - After returning home, remove your clothes, thoroughly inspect all skin surface areas, especially your scalp
 - Shower soon to wash off any unseen ticks

DIAGNOSIS AND TREATMENT

WHAT GENERAL MEASURES SHOULD I TAKE?

- Anyone who has been bitten by a tick should be watched closely for at least a month
- Self care
 - Avoid direct contact with ticks, especially during warmer months
 - Avoid wooded, bushy areas, areas with high grasses and leaf litter
 - Walk in the center of trails
- Activity
 - Check yourself, your children, your pets frequently during and after your walk or hike
 - When walking or hiking in wooded or grassy areas, spray all exposed skin and your clothing with insect repellent
 - You may also treat clothing, such as boots, pants, and socks, with a product that contains permethrin
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 - After returning home, remove your clothes, thoroughly inspect all skin surface areas, especially your scalp
 - Shower soon to wash off any unseen ticks
- To learn more about your condition
 - Center for Disease Control and Prevention (CDC). Lyme Disease. Can be accessed at <http://www.cdc.gov/lyme/>

WHAT ARE COMMON LABS AND TESTS?

- A blood test can be done to check for antibodies to the bacteria that cause Lyme disease
 - The most commonly used is Lyme ELISA test
 - Western blot test for Lyme Disease is done to confirm ELISA results
- Other tests (when the infection has become more widespread) include:
 - Electrocardiogram
 - Echocardiogram
 - Spinal tap (lumbar puncture) to examine spinal fluid
 - MRI of brain

WHAT ARE MY TREATMENT OPTIONS?

- A single dose of antibiotics only if all of the following is true:
 - You have a tick that can carry Lyme disease attached to their body (this usually means that the tick is identified)
 - The tick has been attached for at least 24 hours
 - You can begin taking the antibiotics within 72 hours of removing the tick
 - You are older than 8 years old and not pregnant or breastfeeding
- A 2-4-week course of antibiotics is used to treat diagnosed Lyme disease
 - The specific antibiotic used depends on the stage of the disease and the symptoms

WHAT MEDICATIONS MAY BE PRESCRIBED?

- Antibiotics for Lyme Disease
- Pain medications (i.e. ibuprofen) are sometimes prescribed for joint stiffness

WHAT CAUTIONS SHOULD I TAKE?

- Without treatment, complications involving the joints, heart, and nervous system can occur
 - However, these symptoms are still treatable
- Rarely, symptoms can occur even after having been treated (post-Lyme Disease syndrome)

WHEN SHOULD I SEEK MEDICAL HELP?

- Call your doctor if you have
 - A large, red, expanding rash that may look like a bull's eye
 - Had a tick bite and develop weakness, numbness, or tingling, or heart problems
 - Symptoms of Lyme disease

MY HEALTHCARE PROVIDER'S COMMENTS

REFERENCES

- Center for Disease Control and Prevention (CDC). Lyme Disease. Can be accessed at <http://www.cdc.gov/lyme/>. [Accessed January 2013]
- Kotulak D, Husayko R, et al. Infestations and Diseases Spread by Insect and Animal Bites: Lyme Disease. American Medical Association Family Medical Guide 4th edition 2004;pp.942-943
- Image of Adult Deer Tick courtesy of Scott Bauer, Agricultural Research Service, the research agency of the United States Department of Agriculture [Public Domain] Available at: https://commons.wikimedia.org/wiki/File:Adult_deer_tick.jpg .
- Image of Bull's-eye rash created from disease courtesy of CDC/ James Gathany; Centers for Disease Control and Prevention's Public Health Image Library (PHIL), with identification number #9875. https://en.wikipedia.org/wiki/Lyme_disease.

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