



## 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](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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  - 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
- 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

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## 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](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](https://en.wikipedia.org/wiki/Lyme_disease).

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