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LYME DISEASE

WHAT YOU SHOULD KNOW

WHAT IS LYME DISEASE?

Lyme disease is caused by infection with *Borrelia* bacteria following a bite from an infected tick. Specifically, when the infected tick attaches to the person for a meal of blood, it injects saliva with a variety of factors to aid in its attachment and feeding. The *Borrelia* bacteria are also delivered into the person's blood via this transfer of saliva, where they replicate in the skin, spread through the skin and blood vessels, and infect other areas of the body, especially joints and nerves, where they also replicate causing inflammation and other symptoms.

HOW COMMON IS LYME DISEASE?

Lyme disease is endemic to North America, Europe, Russia and China. It is the most common tick-borne disease in the United States. The Northeast, Mid-Atlantic and upper Midwest accounted for more than 9 out of 10 U.S. cases reported in 2022. The total number of cases reported in 2022 was around 60,000.

HOW IS LYME DISEASE SPREAD, AND WHO IS AT RISK?

Lyme disease is transmitted by the bite of infected ticks, mainly blacklegged (deer) ticks. The majority of transmissions occur following bites by immature ticks or nymphs. Due to the lifecycle of ticks, the majority of infections occur in the spring and summer months. Lyme disease is not transmitted from person to person. While infection during pregnancy may cause an infection of the placenta that results in stillbirth, no recognizable pattern of congenital Lyme infection has been identified.

WHAT ARE THE SIGNS AND SYMPTOMS OF LYME DISEASE?

Symptoms of Lyme disease differ based on how long ago the tick bite occurred.

Early stages include the appearance of a rash that typically looks like a red bull's-eye. Other symptoms can include flu-like symptoms, such as fever, headache, muscle and joint aches, and fatigue. Only about 7 or 8 people out of 10 who are infected will develop a rash.

If left untreated, other symptoms can include additional rashes, pain and swelling in joints, loss of muscle control in the face, severe headaches, and heart palpitations. Some of these symptoms will resolve themselves; however, severe complications, such as arthritis and joint pain, may be prolonged if left untreated.

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CAN LYME DISEASE BE TREATED?

A variety of tests are available to detect Lyme disease, so people should consult their doctor if they believe they may have it. Lyme disease can be treated by antibiotics and, if caught early, usually leads to a full recovery.

IS THERE A LYME DISEASE VACCINE?

From 1998 to 2002 there was an approved vaccine for Lyme disease in the United States. Though the vaccine was safe and prevented infection in 10 of 10 children and almost 8 of 10 adults, the vaccine was removed from the market due to low demand. The low demand resulted from reports linking the vaccine with risk of arthritis or development of autoimmunity. However, these reports were investigated by the Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC), and no unusual connection was found between the vaccine and development of these side effects. Unfortunately, because of low sales and unfounded safety concerns, people in the United States cannot protect themselves from Lyme disease by vaccination at this time. A new vaccine is in clinical trials, so hopefully, over time, people will again have the option to protect themselves against Lyme disease through vaccination. A monoclonal antibody treatment is also being evaluated as a possible tool for protection. Since antibodies only last for a few months, this product would likely require annual dosing probably in late spring or early summer.

HOW CAN LYME DISEASE BE PREVENTED?

In many cases, a tick must be attached for 36 to 48 hours before the bacteria are transmitted. Thus, one of the best ways to prevent Lyme disease is to check for ticks immediately after being outdoors, especially in forested areas. Other preventative measures include wearing long sleeves and pants to prevent attachment of ticks, using insecticides that contain DEET, and treating clothing with permethrin (an insect repellent).

This information is provided by the Vaccine Education Center at Children's Hospital of Philadelphia. The Center is an educational resource for parents, the public and healthcare professionals and is composed of scientists, physicians, mothers and fathers devoted to the study and prevention of infectious diseases. The Vaccine Education Center is funded by endowed chairs from Children's Hospital of Philadelphia. The Center does not receive support from pharmaceutical companies.

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