

Lyme Disease

What is Lyme disease?

Lyme disease is an illness caused by the bacterium, *Borrelia burgdorferi*, which can be spread through the bite of certain types of ticks. Lyme disease in humans can have serious symptoms but is usually effectively treated. Cases of Lyme disease have been reported in parts of Europe, Asia, and throughout much of North America.

What are Ticks?

Ticks are slow moving, non-flying insects closely related to spiders. They are typically small when unfed (1 to 5 mm in length) and are red and dark brown in colour. Young ticks in the pre-adult stage are smaller and lighter in colour, while fed adult ticks can be the size of a grape. All active stages feed on blood.



Blacklegged ticks pass through three different life stages (larva-1, nymph-2, adult male-3, adult female-4). The nymphal stage typically occurs during the summer months and is the stage most likely to infect people with Lyme disease. This is due to their small size which prevents people from noticing them on their body. The ticks in the picture sit atop a dime for reference to their small size.

Transmission

Ticks, specifically the blacklegged tick (also known as deer tick), acquire Lyme disease-causing bacteria when larva feed on infected mammals. Infected mammals include mice (especially the white-footed mouse), squirrels, birds, and other small animals. Over the winter, the larvae lie dormant, but reappear as nymphs in the spring. These infected nymphs then feed on some other mammal host, which often includes humans, and Lyme disease is subsequently transmitted.

Ticks usually come in contact with people or animals by positioning themselves on tall grass and bushes. They may take several hours to find a suitable place on the host to attach to feed. Most tick bites are painless and the majority of bites will not result in disease as most ticks are not infected with the agent of Lyme disease. When a tick bites a human, its mouth parts become attached to the skin. Ticks feed slowly and their body gradually enlarges as it feeds, making it more visible. It usually takes from 3 to 7 days for a blacklegged tick to take a complete blood meal. Lyme disease is acquired in humans when the bacterium *Borrelia burgdorferi* moves from the tick into the human body. This usually occurs after the tick has been attached to the skin for more than 24 hours as the bacteria requires time to migrate from the tick's gut to its salivary glands. For this reason, prompt removal of the tick is essential in preventing Lyme disease transmission.

Not all ticks are capable of carrying these bacteria, but because Lyme disease has been consistently documented in Canada, awareness of this illness and its transmission is critical. Research shows that blacklegged ticks are found in all areas of Canada, and approximately 10% of these ticks are infected with *Borrelia burgdorferi*.

Symptoms and Diagnosis

Symptoms of Lyme disease are categorized into stages, which are progressive in nature. The first sign of infection is usually a circular rash that takes the appearance of a bull's eye. This rash occurs at the site of the tick bite and will occur within 3 days to one month of being bitten. Additional symptoms are flu-like and include fever, chills, headache, muscle and joint pain, fatigue and swollen lymph nodes.



The second stage of the disease can last several months. Symptoms of this stage include migraines, weakness, multiple skin rashes, painful or stiff joints, abnormal heartbeat and extreme fatigue.

The third stage of Lyme disease can include symptoms such as chronic arthritis and neurological symptoms, including headaches, dizziness, numbness, and paralysis. These symptoms can last up to several years if untreated.

Later stages of Lyme disease are rarely encountered because in most cases, Lyme disease is correctly diagnosed and treated accordingly. While fatalities from Lyme disease are rare, if contracted by a mother during pregnancy Lyme disease can pose serious health risks to the baby, including stillbirth.

A diagnosis of Lyme disease is made following a blood test, along with the assessment of symptoms and clinical evidence. Because a blood test only identifies the presence of antibodies and not necessarily the bacteria itself, it is important to note that Lyme disease can only be diagnosed when the physical manifestations that characterize the illness exist.

Treatment

Upon diagnosis of Lyme disease, antibiotics are administered. The success rate of these antibiotics is quite high, and in most cases, Lyme disease is cured in 2-4 weeks. For individuals in the later stages of the disease and presenting with neurological or cardiac symptoms, intravenous antibiotic treatment may be required.

Prevention and Precautions

The key to preventing Lyme disease is to take necessary precautions, particularly when entering areas that have documented tick populations. These precautions include:

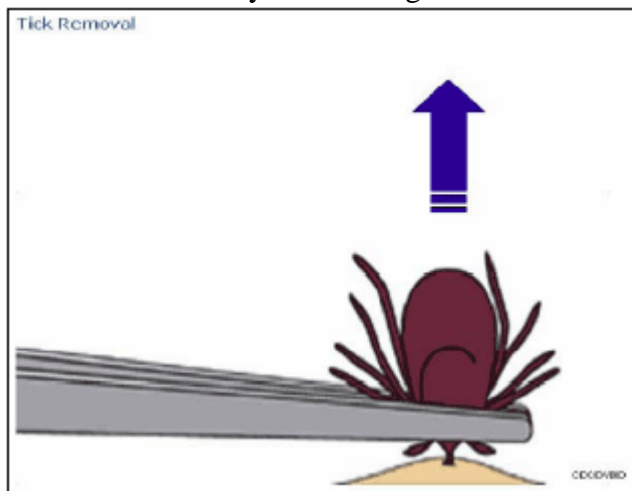
- Wearing long clothing when in the outdoors. This includes long-sleeved shirts, long pants, socks, and shoes. Shirts should be tucked into pants and pants tucked into socks.
- Wearing light coloured clothing. Lighter colours will help you to identify a tick and remove it before it can attach to feed.

Lyme Disease notes from Peterborough County-City Health Unit

- Using a bug repellent containing DEET. Apply bug repellent to clothing and exposed skin to ward off ticks. Be sure to follow the manufacturer's instructions.
- Checking your clothing and entire body for ticks once returning indoors after being outside in forested areas. Pay special attention to areas such as the groin, scalp and armpits. Use a mirror to check the back of your body, or have someone else check it.
- Checking your pet periodically for ticks as they can pick them up from outdoor areas and carry them into your home.

Removing Ticks

- To remove a tick, use a pair of fine-tipped tweezers and grasp the tick as close to the mouth parts as possible.
- Use the tweezers to pull the tick straight out of the skin.
- Do not twist or crush the tick as this may cause Lyme disease-causing bacteria within the tick to leak out onto the skin.
- Do not apply anything to the tick or try to burn it off the skin.
- Wash the area where the tick was removed with soap and water and/or rubbing alcohol.
- After the tick has been removed, place the tick into an empty pill bottle or plastic zipper-closed bag and bring it to the Peterborough County-City Health Unit. The tick can be sent to a health laboratory for identification and tested for Lyme disease.
- Try to remember the location where you most likely acquired the tick. It will help public health workers to identify areas of higher risk.



Lyme Disease in Canada

Lyme disease is not considered to be a nationally reportable disease, meaning that cases are not always documented at the federal level. However, some areas are recognized as having a higher risk for development of the disease. These regions include south and eastern Ontario, southeastern Manitoba and Nova Scotia, and southern British Columbia.

Lyme Disease notes from Peterborough County-City Health Unit

In Ontario, blacklegged ticks are more commonly found in areas along the north shores of Lake Erie, Lake Ontario, and the St. Lawrence River.

Locations with established blacklegged tick populations infected with the Lyme disease agent, include: Long Point Provincial Park, Turkey Point Provincial Park, Rondeau Provincial Park, Point Pelee National Park, Prince Edward Point National Wildlife Area, and in the St. Lawrence Islands National Park area. It is difficult to define the precise boundaries of these established tick populations, but it is anticipated that some of these populations will continue to expand into neighbouring areas. Since blacklegged ticks are also known to feed on migratory birds, it is possible that they can be transported throughout the province. Therefore, while the potential is low, it is possible for people to encounter blacklegged ticks, or to be infected with Lyme disease from the bite of an infected blacklegged tick, almost anywhere in the province.

For More Information

Ontario Ministry of Health and Long Term Care

<http://www.health.gov.on.ca/en/public/publications/disease/lyme.aspx>

Public Health Agency of Canada

<http://www.phac-aspc.gc.ca/id-mi/tickinfo-eng.php>

Health Canada, It's Your Health

http://www.hc-sc.gc.ca/hl-vs/alt_formats/pacrb-dgapcr/pdf/iyh-vsv/diseases-maladies/lyme-eng.pdf

Canada Communicable Disease Report: The rising challenge of Lyme borreliosis in Canada

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/08vol34/dr-rm3401a-eng.php>

CanLyme: Canadian Lyme disease Association

<http://www.canlyme.com/>

Centers for Disease Control and Prevention (U.S.A.)

<http://www.cdc.gov/ncidod/dvbid/Lyme/index.htm>

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