Lyme Disease In Michigan

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For more information, visit: www.michigan.gov/emergingdiseases

What is Lyme Disease?

Lyme disease is an illness caused by the bacterium, *Borrelia burgdorferi*, which is transmitted to animals and people through the bite of infected Black-legged Ticks. The disease is reported worldwide, and throughout the United States. Lyme disease is the most common arthropod-borne illness in the U.S. with 23,763 nationwide cases reported to the Centers for Disease Control and Prevention in 2002. Most cases (>95%) are reported from just 12 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Wisconsin. Factors potentially contributing to this increase in reported cases include residential development of wooded areas, tick dispersal to new areas, improved disease recognition in areas where Lyme disease is endemic or emerging, and enhanced reporting.

In Michigan, Lyme disease has historically been isolated to the region around Menominee County in the Upper Peninsula where the Black-legged Tick (*Ixodes scapularis*), the principle vector in the U.S., is found. Recently, however, researchers have discovered areas of lower Michigan where the ticks have established populations. It is important to know whether Black-legged Ticks are present in an area, as they are the only known vector of Lyme disease in the Upper Midwest.

Symptoms

An infected tick must feed for approximately 48 hours to transmit Lyme disease bacteria to its host. Therefore, prompt removal of ticks can prevent infection. Using tweezers or forceps, grasp the tick as close to the skin as possible, and using gentle pressure, pull straight out. Ticks can be submitted to the Michigan Department of Agriculture for identification and testing. Up to 70% of infected persons present with a "Bull's-eye" rash around the site of the tick bite 3-30 days after exposure. The rash expands over time, with no pain or itch.

Above: Characteristic "bull's-eye" rash associated with early Lyme disease.

Other early symptoms may include:

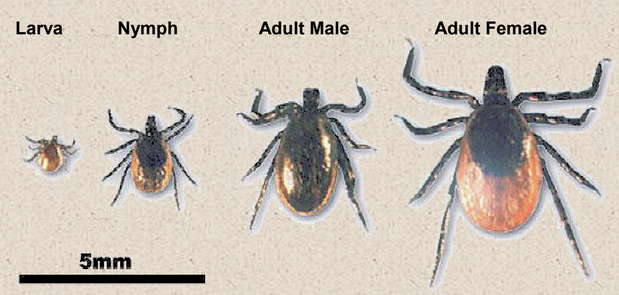
- Headache
- Spreading Rash
- Nausea
- Aching Joints and Muscles
- Fever
- Fatigue

Weeks to months after initial exposure to the bacteria, or after the first symptoms appear, some people may develop complications involving the heart and/or nervous system. Specific disorders may include:

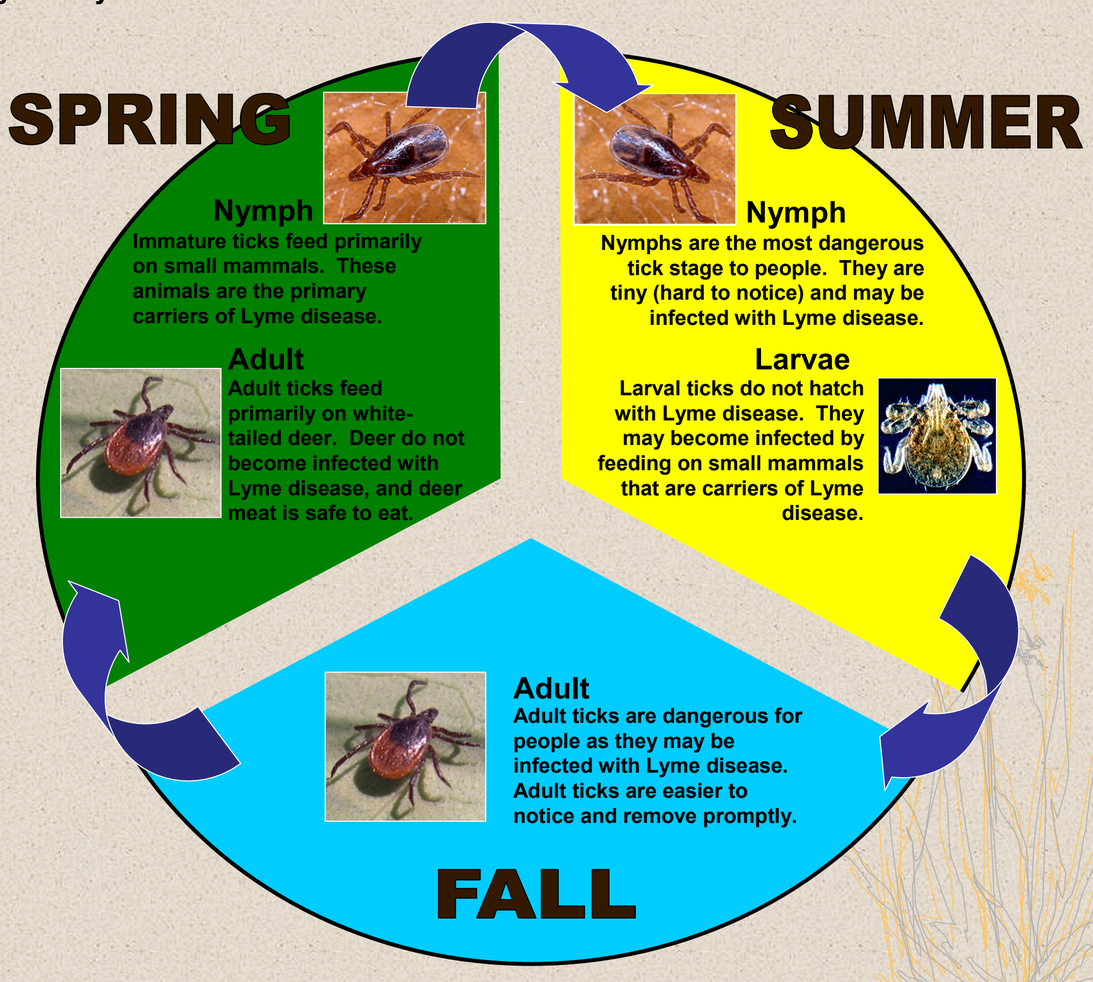
- various degrees of heart block
- nervous system abnormalities such as meningitis, encephalitis and facial paralysis (Bell's palsy), and other conditions involving peripheral nerves
- painful joints, tendons, or muscles may also be noted during this stage of the disease.

Most people can successfully be treated with antibiotic therapy, when diagnosed in the early stages of Lyme disease.

The Black-legged Tick

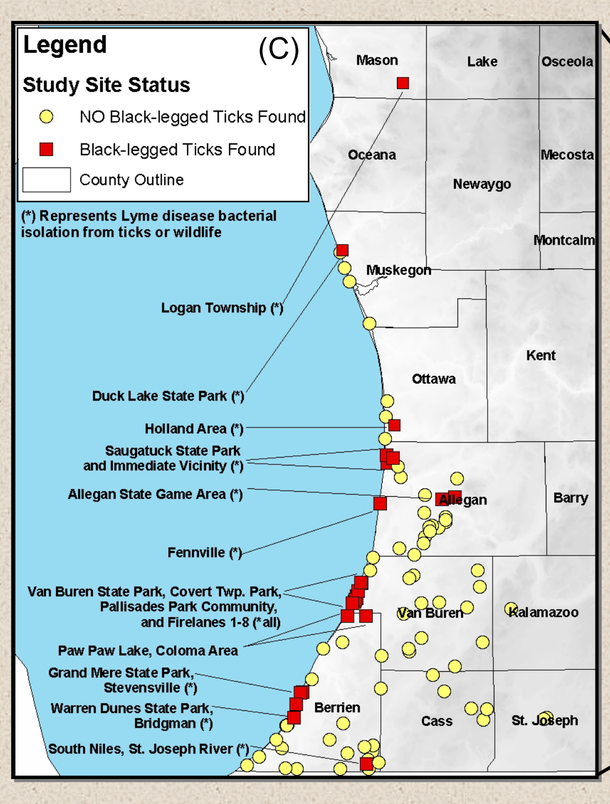


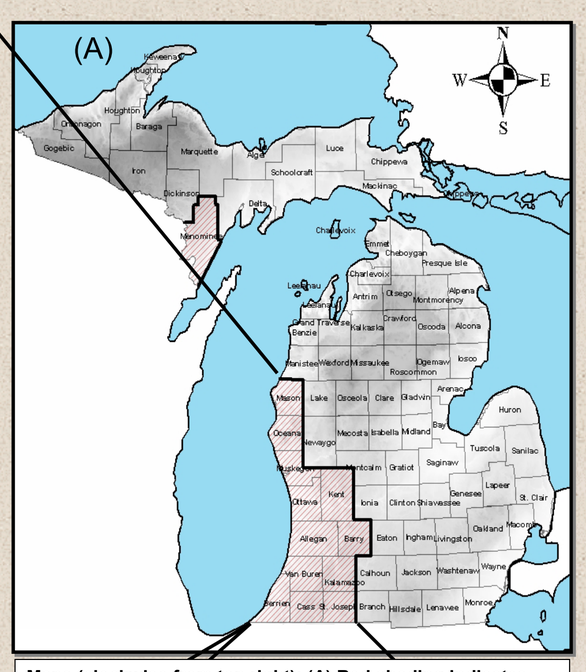
The black-legged tick falls within the family *Ixodidae,* or "hard-ticks". Most ixodid ticks 'quest' (ambush) for hosts in low lying brush and leaf litter on the forest floor. This is accomplished by climbing to the edge of leaves or twigs, and holding their front legs out. When a host passes by, they attach themselves and look for a suitable feeding site. They are widely dispersed, but often accumulate along pathways, game trails, or bedding locations used by their hosts. In Michigan, these ticks prefer forested areas with sandy soils.



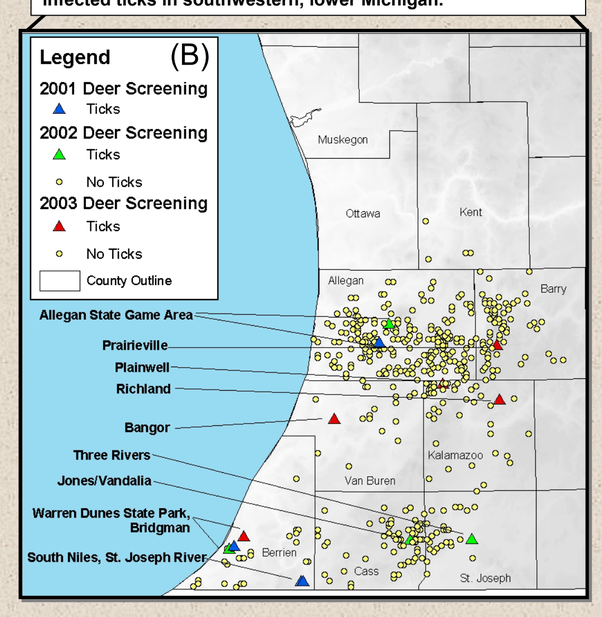
Lyme Disease Risk in Michigan

Increased surveillance efforts are currently being focused on Western Lower Michigan. The region, which previously showed no evidence of Lyme disease activity, has been identified as an area of concern by researchers studying the distribution of the Black-legged Tick. Investigations conducted from 2001-2003 have discovered establishing populations of ticks, and identified *Borrelia* bacteria in the wildlife and tick populations. The maps below are excerpts of these results.





Maps (clockwise from top right): (A) Red shading indicates counties where Black-legged ticks have been found, and the risk of Lyme disease is elevated. (B) Deer screening at DNR check stations reveals expanding tick populations in southwestern, lower Michigan. (C) Direct field investigations conducted by Michigan State University have recently found infected ticks in southwestern, lower Michigan.

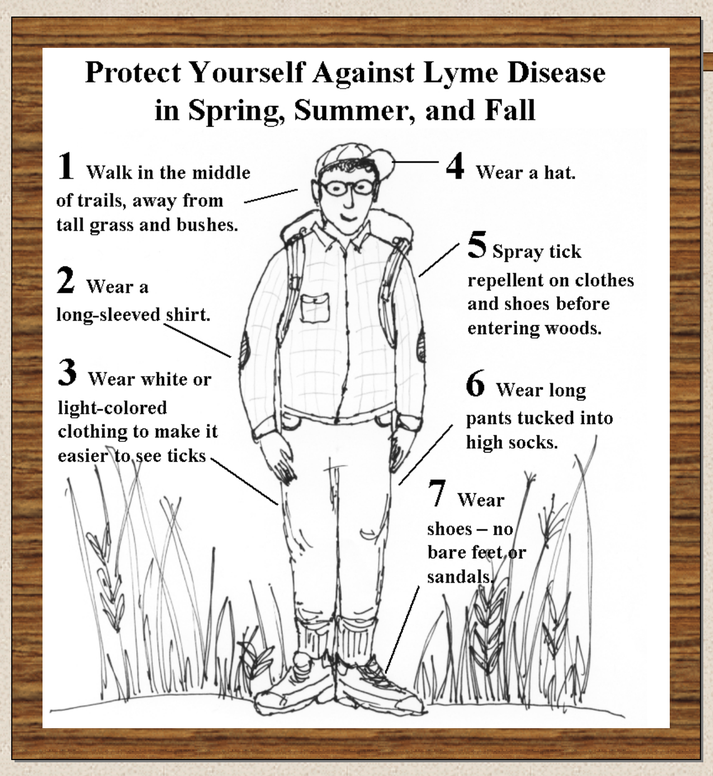


Hosts

White-footed mice and chipmunks are carriers of the disease and a favorite host for immature ticks.

The white-tailed deer is not a carrier of Lyme disease. White-tailed deer provide an excellent meal for adult ticks, as well as providing a means for travel to new areas.

People become unwilling participants in the Lyme disease cycle by recreating or working in tick infested habitats. Knowing where and when ticks can be found, and taking appropriate protective measures are the most important factors in prevention.



How You Can Reduce Your Risk of Lyme Disease

If you are going to be in areas that may be tick infested, there are several ways you can protect yourself:

- Wear light colored clothing so ticks can be spotted more easily, and removed before attachment.
- Wear long sleeved shirts and tuck pants into socks, or boot tops to prevent ticks from reaching your skin.
- Ticks are usually located close to the ground, so boots or shoes, and not sandals, are recommended.
- Apply insect repellants that contain DEET (n,n-diethyl-m toluamide) to clothes and exposed skin, and/or apply Permethrin (which kills ticks on contact) to clothes to reduce the risk of tick attachment.
- Repellants containing DEET can be used safely on adults at concentrations below 35%, and children at concentrations at or below 10%, and should be applied according to label guidelines.

Prompt Tick Removal

Check yourself and children for attached ticks after recreating in areas that may be tick infested. The safest way to remove ticks is to use fine-tipped forceps or tweezers. Grasp the tick as close to the skin as possible, and with gentle pressure, pull straight out. Wash the bite site thoroughly.