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Lyme Disease in Michigan

Michigan State University Extension Service

Michigan Department of Public Health, Michigan Department of Natural Resources,

Michigan Department of Agriculture, and Michigan State University

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4 pages

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To report a case of Lyme disease, physicians should contact their local health department.

For information regarding specific questions about the effects of Lyme disease on human health, wildlife, or domestic animals, consult one of the agencies listed below:

Michigan Department of Public Health  
Bureau of Environmental and Occupational Health (517) 335-9214 or  
Bureau of Infectious Disease Control (517) 335-8165  
3423 North Logan Street/Martin L. King Jr. Blvd.  
P.O. Box 30195  
Lansing, MI 48909

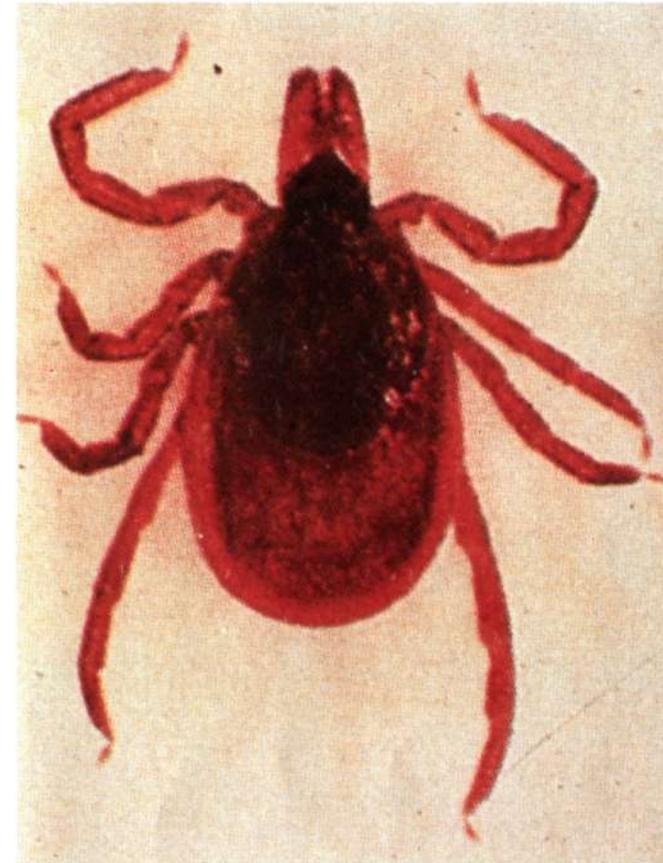
Michigan Department of Natural Resources  
Rose Lake Wildlife Disease Laboratory  
(517) 373-9358  
8562 E. Stoll Road  
East Lansing, MI 48823

Michigan Department of Agriculture  
Animal Industry Division (517) 373-1077  
Ottawa Towers North, Fourth Floor  
P.O. Box 30017  
Lansing, MI 48909

Michigan State University  
Cooperative Extension Service (517) 355-4662  
Department of Entomology  
243 Natural Science Building  
East Lansing, MI 48824

Adapted from "Lyme Disease in Wisconsin: An Update" by State of Wisconsin and "Lyme Disease" by Pfizer Control Research. (C) 1986, 1987

# Lyme Disease in Michigan



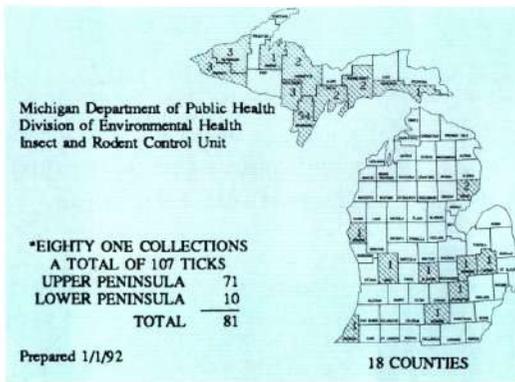
Michigan Department of Public Health  
Michigan Department of Natural Resources  
Michigan Department of Agriculture  
Michigan State University

## General

Lyme disease is an illness caused by a spirochete bacterium (*Borrelia burgdorferi*). This disease is transmitted to people and animals primarily by the bite of the tick *Ixodes dammini*. The causative bacteria have also been found in other ticks and in biting insects, such as horse flies, deer flies, and mosquitoes, but it has not been determined if these can transmit the disease.

Lyme disease was first recognized in the United States in 1975 in children from Lyme, Connecticut, however, the bacterium that causes Lyme disease was not identified until 1982. Since, then, Lyme disease has been reported with increasing frequency. The majority of cases occur along the east coast from Delaware to Massachusetts; followed by Wisconsin, Minnesota, and California. However, cases have been reported from 47 states, including Michigan.

In Michigan, risk for Lyme disease is highest in the western part of the upper peninsula. The rate of possible Lyme disease cases there is similar to the rate in Northern Wisconsin. In addition, infected *Ixodes dammini* ticks can be found in significant numbers in some areas of the western upper peninsula. The number of suspect Lyme disease cases reported in the lower peninsula is higher than the numbers reported for the upper peninsula, but the rate of Lyme disease for Michigan's lower peninsula is lower. In addition, *Ixodes dammini* ticks are very difficult to find in the lower peninsula. As of this writing, January 1992, no infected *Ixodes dammini* ticks have been found in the lower peninsula. Problems with interpretation of available laboratory tests for Lyme disease make it difficult to know how much Lyme disease is occurring in Michigan. In spite of difficulty in interpreting the test, Michigan Department of Public Health has verified that some cases fitting the classic description of Lyme disease have occurred following exposure in the lower peninsula.



*IXODES DAMMINI* TICKS\*  
SUBMITTED FOR IDENTIFICATION  
MICHIGAN 1985-1991

## Signs and Symptoms of Lyme Disease

Lyme disease is an illness which can cause **serious** problems involving the heart, joints, and nervous systems in some persons.

Lyme disease typically progresses through three stages, depending upon how soon the disease is diagnosed and treated. Prompt medical attention will minimize complications involving the heart, nervous system, and joints.

### Stage 1

In the earliest stage, people with Lyme disease may have any combination of the following signs and symptoms:

- headache
- nausea
- fever
- a spreading rash
- aching joints and muscles
- fatigue

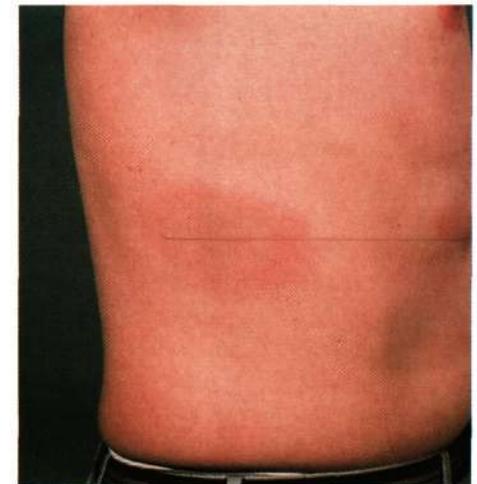
Without treatment, these signs and symptoms may disappear altogether, or they may recur intermittently for several months. The characteristic red rash, called Erythema migrans (EM) usually appears within 3 to 32 days after a person is bitten by an infected tick. The rash is circular in shape and can attain a diameter of 2-20 inches, with the center of the rash becoming cleared. EM is not restricted to the bite site and more than one lesion can occur on the body. Up to 30% of the people who have Lyme disease do not develop EM lesions, making diagnosis more difficult.

### Stage 2

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, 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.

### Stage 3

Arthritis is the most commonly recognized long-term sign of Lyme disease. From one month to years after their first symptoms appear, people may experience repeated attacks of arthritis. Research has shown that even if Lyme disease was not diagnosed and treated promptly, people who eventually received appropriate antibiotic therapy had fewer relapses than those who were never treated.



Approximately 70% of the people who contract Lyme disease develop a large red rash called erythema migrans (EM).  
Photo by Dr. John Melski

## Treatment

If you develop any of the symptoms and recall being bitten by a tick, or have been in an area where ticks are present, discuss your suspicions of Lyme disease with your physician. Your physician will make a diagnosis based on your signs and symptoms, lab tests, and information you provide about recent travels, or history of tick or insect bites. Prompt diagnosis and treatment with antibiotics can cure the infection and prevent later complications. Treatment during later stages of the disease often requires more intensive antibiotic therapy.

## Lyme Disease in Domestic Animals

Domestic animals can also develop Lyme disease. Lyme disease has been diagnosed in dogs in Michigan. It has been suspected in horses, cattle, and cats. Cases of Lyme disease in animals are reportable to the Michigan Department of Agriculture which continues to monitor Lyme disease in Michigan animals. Relatively few cases of Lyme disease in animals have been reported in Michigan, especially in comparison to states where Lyme disease is prevalent. Signs of Lyme disease in dogs may include various combinations of the following:

- fever
- poor appetite
- lameness in one or more joints
- general malaise

Cats, cattle, horses, and other domestic animals may also exhibit a variety of signs, including fever and lameness. Testing for Lyme disease in animals can be done by a veterinarian through the Animal Health Diagnostic Laboratory at Michigan State University. Prompt diagnosis and appropriate antibiotic treatment can rapidly alleviate the signs and pain of Lyme disease in animals.

## Prevention

Avoid exposure during times and in places where ticks are known to be or may be present. If out doors at times and in places where ticks may be present:

1. Wear long pants tucked into boots or socks and long-sleeved shirts, buttoned at the cuff; tightly woven materials are best.
2. Wear light colored clothing which makes ticks easier to see for removal.
3. Apply insect/tick repellent to exposed skin and/or to pants, socks, and shoes. Follow the product label directions for proper use. Products containing DEET may have directions for use on both skin and clothing, whereas, those containing permethrin are applied to clothing only.
4. Walk in the center of trails to avoid brushing up against vegetation.
5. Conduct thorough tick checks on yourself, your children, and pets after spending time outdoors. Remember that the immature stages of the *Ixodes* tick are small, from about the size of the period at the end of this sentence to the size of a sesame seed.
6. Remove any tick you find as soon as possible.
7. Mowing grass short around your house and outbuildings may make the area unattractive to ticks, thereby decreasing their number in the area.

## Removing Ticks

1. The mouthparts of a tick are shaped like tiny barbs. The best way to remove a tick is to grasp it with tweezers as close to the skin as possible and gently, but firmly, pull it straight out. If tweezers aren't available, grasp the tick with a piece of tissue. Do not twist or jerk the tick because the head may remain embedded, which can lead to infection at the bite site. If the head or mouthparts do break off, consult your doctor about removing them.



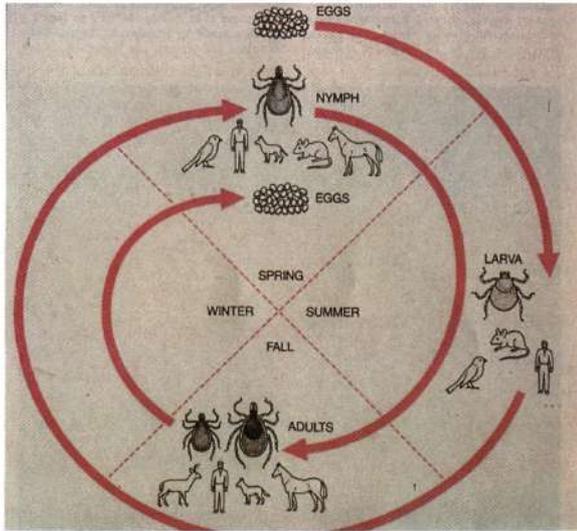
*To remove an embedded tick, grasp it close to the skin and pull it straight out. Photo by Terry Amundson.*

2. Wash the bite area and your hands with soap and water and apply an antiseptic to the bite site.
3. Adult ticks can remain on animals through the fall and winter. If you spend a lot of time outdoors, be sure to check yourself, your family, and your pets daily for ticks. If you hunt or trap, check areas where you store your game for ticks that may have fallen off during handling.

## The Tick

The tick *Ixodes dammini* is the most common carrier of Lyme disease in Wisconsin, Minnesota, and eastern coastal states. Other species of ticks such as the dog tick or wood tick, the lone-star tick, the rabbit tick, and biting insects such as mosquitoes, deer flies, and horse flies have been shown to carry the Lyme disease bacteria. However, their ability to transmit the disease is not known at this time. Studies are continuing in Michigan to determine the extent of the *Ixodes* tick population.

The *Ixodes* tick has a rather complex life cycle which involves developing from an egg to a larva, larva to a nymph, and finally from a nymph to adult. This process usually takes two years. *Ixodes* ticks are among the first ticks to become active in the spring, and they remain active in various life stages until late fall.

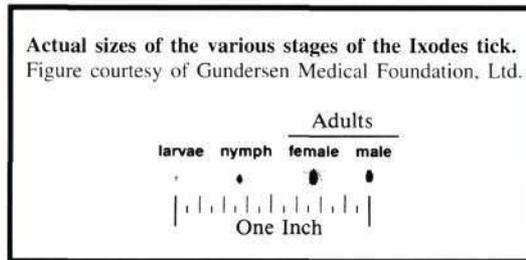


Life Cycle of the tick, *Ixodes dammini*.  
Courtesy of Scientific American, July, 1987, page 80.



To appreciate how small an *Ixodes* tick is, imagine placing a tick on a dime. Only the words, "in God we trust" would be covered by the tick. The nymph stage is even smaller, and the larval stage is so small, it is almost invisible.

Photo by Dan Sutherland



Adult female *Ixodes* tick is shown in its unengorged and blood-engorged state (about seven times actual size).



An engorged *Ixodes* nymph, shown in relation to the size of a common pin, in the act of drawing blood from its human host.



*Ixodes dammini* female and male ticks (about seven times actual size).

## In General

If you do develop the signs and symptoms of Lyme disease, contact your physician promptly. Treatment in the early stages of the disease can usually prevent complications.

For additional information about Lyme disease, contact your physician or local health department.