



District Health Department #10



REPORT TO THE BOARDS OF HEALTH

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Mid-Michigan District Health Department, Wednesday, May 24, 2017

Central Michigan District Health Department, Wednesday, May 24, 2017

Ticks and Tick-borne illness

Ticks are very small insects that feed on the blood of wildlife, but will also feed on people and pets that work in or enjoy the areas ticks live. Tick most commonly live in wooded areas, fields near wooded areas, and grassy shorelines. They are rarely found indoors, unless they are brought in on a pet, person, or clothing¹.

There are an estimated 899 species of ticks in the world, over 90 of which reside in the U.S.² Only about 10 tick species in the United States spread diseases². There are over 20 known species of ticks in Michigan¹. The most common are the American dog tick, or wood tick, (making up 76% of Michigan ticks sent in for identification), Blacklegged tick, or deer tick (15%), Lone star tick (5%), Woodchuck tick (3%), and Brown dog tick, or kennel tick (1%)¹. See page 5 of this report for pictures of these five ticks, their distribution, and hyperlinks to the diseases they spread

Ticks start as an egg, then go through a larval stage, a nymphal stage, then become adults³. Larva start life disease-free³. They can become infected when they feed on an infectious host³. Deer ticks, which carry Lyme disease, the most commonly reported tick-borne illness, start as larva in the late summer. Once larva feed, which is usually in August and September, they drop off their host, molt over winter and emerge in May as nymphal ticks, which are about the size of a poppy seed³. These nymphal ticks feed through mid-summer. Most cases of Lyme disease occur from May through July, which is due to this active feeding of nymphal ticks. Adult ticks, primarily females, become active in October, and may remain active through winter whenever the ground is not frozen. Females that are blood-engorged that survive the winter will lay eggs in late May, that will hatch in July and then larval ticks will begin feeding in August and September once again. Dogs, horses, cattle, white-tailed deer, mice, chipmunks, gray squirrels, raccoons, and opossums can all be infected with Lyme disease, therefore any larva feeding on these animals can carry it to another animal, including humans⁴. Opossums are the only animal known to eat ticks.

Signs and Symptoms of Untreated Lyme Disease (from www.michigan.gov/emergingdiseases)

Untreated Lyme disease can produce a wide range of symptoms, depending on the stage of infection. These include fever, rash, facial paralysis, and arthritis. Seek medical attention if you observe any of these symptoms and have had a tick bite, live in an area known for Lyme disease, or have recently traveled to an area where Lyme disease occurs (see map below).

¹ Michigan Department of Health and Human Services, Michigan Department of Natural Resources, Michigan State University. (2017). Ticks and Your Health; Preventing tick-borne illness in Michigan. Retrieved on May 9, 2017 from http://www.michigan.gov/documents/emergingdiseases/resize_307382_7.pdf

² Purdue Extension, Entomology, Centers for Disease Control and Prevention, Indiana State Department of Health. (n.d.). Insects and Ticks . Retrieved May 09, 2017, from <https://extension.entm.purdue.edu/publichealth/insects/tick.html>

³ TickEncounter Resource Center. (n.d.). Life-cycle of Ixodes scapularis (a.k.a. blacklegged or deer tick). Retrieved May 09, 2017, from http://www.tickencounter.org/tick_identification/deer_tick_life_cycle

⁴ The Center for Food Security and Public Health. (2013). Fast Facts: Lyme Disease. Retrieved on May 9, 2017 from http://www.cfsph.iastate.edu/FastFacts/pdfs/lyme_disease_F.pdf

Early Signs and Symptoms (3 to 30 days after tick bite)

- Fever, chills, headache, fatigue, muscle and joint aches, and swollen lymph nodes
- Erythema migrans (EM) rash (**see poster below**):
 - Occurs in approximately 70 to 80 percent of infected persons
 - Begins at the site of a tick bite after a about 3 to 30 days (average is about 7 days)
 - Expands gradually over a period of days reaching up to 12 inches or more (30 cm) across
 - May feel warm to the touch but is rarely itchy or painful
 - Sometimes clears as it enlarges, resulting in a target or “bull’s-eye” appearance
 - May appear on any area of the body

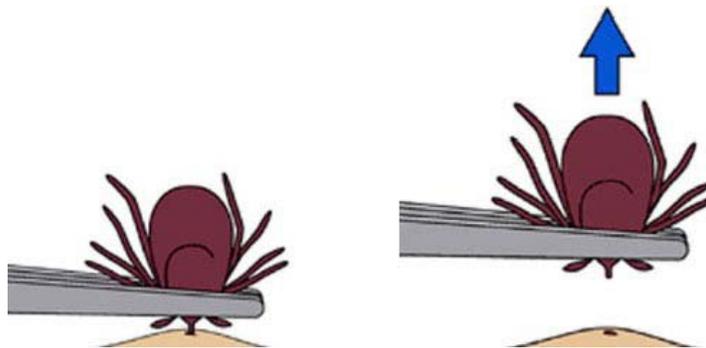
Later Signs and Symptoms (days to months after tick bite)

- Severe headaches and neck stiffness
- Additional EM rashes on other areas of the body
- Arthritis with severe joint pain and swelling, particularly the knees and other large joints.
- Facial palsy (droop on one or both sides of the face)
- Intermittent pain in tendons, muscles, joints, and bones
- Heart palpitations or an irregular heart beat (Lyme carditis)
- Episodes of dizziness or shortness of breath
- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbness, or tingling in the hands or feet
- Problems with short-term memory

How to remove a tick (from <https://www.cdc.gov/lyme/removal/index.html>)

If you find a tick attached to your skin, there’s no need to panic. Several tick removal devices are available on the market, but a plain set of fine-tipped tweezers will remove a tick effectively. Avoid folklore remedies such as "painting" the tick with nail polish or petroleum jelly, or using heat to make the tick detach from the skin. Your goal is to remove the tick as quickly as possible—do not wait for it to detach.

1. Use fine-tipped tweezers to grasp the tick as close to the skin’s surface as possible.
2. Pull upward with steady, even pressure. Don’t twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.
4. Dispose of a live tick by submersing it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet. Never crush a tick with your fingers.



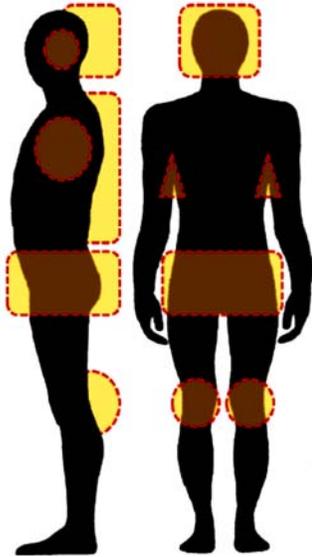
You can also have the tick identified professionally, as only certain ticks can transmit disease. If the tick is still alive and is a Blacklegged tick, it will be tested to see if it is carrying Lyme disease. Directions for tick testing can be found at: http://www.michigan.gov/documents/emergingdiseases/Tick_testing_flow_chart_227376_7.pdf . If the tick is alive, place it in a small container with a small piece of paper towel moistened with a few drops of water. If the tick is dead, place it in a small, watertight container filled with water or alcohol.

Board of Health Monthly Healthy Living Recommendations:

1. Be aware of diseases ticks can carry.
2. Take steps to avoid tick bites.
3. Check *CAREFULLY* for ticks after spending any amount of time in tick-prone areas.

Ticks can spread disease, including Lyme disease. Protect yourself:

- ✘ Use insect repellent that contains 20 - 30% DEET.
- ✘ Wear clothing that has been treated with permethrin.
- ✘ Take a shower as soon as you can after coming indoors.
- ✘ Look for ticks on your body. See the image to the right for areas that ticks tend to bite.
- ✘ Put your clothes in the dryer on high heat for 60 minutes to kill any remaining ticks.



Feel for bumps and look for tiny brown spots, especially in these areas:

1. Scalp	3. Underarms	5. Waist & Back	7. Pelvic Area
2. Ears	4. Belly Button	6. Behind Knees	8. In Between Legs

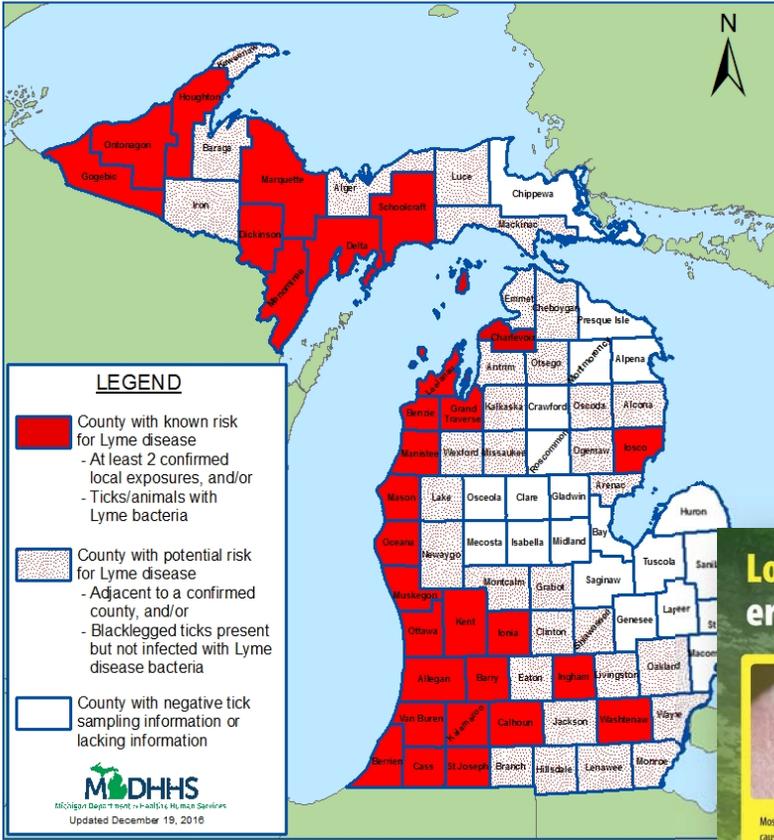
Please refer to *Ticks and Your Health* booklet, available at http://www.michigan.gov/documents/emergingdiseases/resize_307382_7.pdf for detailed information about ticks in Michigan, the diseases they carry, prevention of tick bites including landscaping considerations, tick prevention in pets, plus more.

Michigan Lyme Disease Risk Map: 2016

Lyme disease is an emerging disease transmitted by the blacklegged tick in Michigan. Local risk for Lyme disease varies depending on whether infected ticks are in the area. Several local and state agencies partner to conduct surveillance for Lyme disease in people and animals. The below map classifies risk upon field collected and infected animals and reported human cases of Lyme disease in Michigan (see the legend for specific details). The map is updated as new information becomes available.



For more information about Lyme disease prevention, visit www.michigan.gov/lyme



http://www.michigan.gov/images/emergingdiseases/EM_poster_web_490161_7.jpg

http://www.michigan.gov/images/emergingdisease/s/2015_Lyme_Risk_Map_485658_7.jpg

Looking for a bull's-eye rash? Look again – erythema migrans can take many forms.



Most people do not see the tick that causes their Lyme disease. However, approximately 75% of patients with early Lyme disease will have the telltale skin lesion in the first 1-4 weeks of infection. The Lyme disease skin lesion is large, greater than 5 cm (2 inches), in size. It can be distinguished from an uninfected tick or bug bite because it lasts days or weeks and enlarges in size over time. When the skin lesion is present, it is a more accurate way to diagnose Lyme disease than by using the currently available blood tests.

Most clinicians recognize the classic target lesion or bull's-eye rash. However, most are not aware that the majority of Lyme disease skin lesions are uniformly red or reddish-blue. In late spring and early summer when early Lyme disease is most prevalent, any of the skin lesions shown here could be indicative of Lyme disease. Fever, chills, and muscular pain in the neck and extremities are common early Lyme disease symptoms. The presence of these symptoms with a rash should raise the suspicion of a Lyme disease diagnosis.



Central Clearing/ Target Lesions

The classic bull's-eye target lesion of Lyme disease occurs in the minority of patients. The majority of Lyme disease skin lesions lack the hallmark rings and central clearing. **Only about 20% of Lyme disease lesions have a bull's-eye appearance.**



Uniformly Red Lesions

Most Lyme disease skin lesions are uniformly red without the rings or target appearance. They are distinguished from other skin rashes by their round or oval shape and sharply demarcated borders. Skin lesions often hide in difficult to see places such as behind the knee or in the groin or armpit.



Blistering Lesions - It's not a spider bite.

1% of Lyme disease skin lesions have a central blistering or pustular appearance that is commonly mistaken for a spider bite. Why does this occur? It is likely a more severe inflammatory reaction to *Borrelia burgdorferi* that results in skin blistering.



Blue-Red Lesions

Some Lyme disease skin lesions have a blue-purple color and can be mistaken for a bruise. What distinguishes this from a bruise? The perfectly uniform circle and sharply demarcated border. They may be minimally pruritic or sensitive to touch but are not pruritic like poison ivy or extremely painful like shingles or cellulitis.



Disseminated Lesions

These are not multiple tick bites. The original skin infection of Lyme disease can spread through the bloodstream to other areas of the body, including the joints, nervous system and other areas of the skin. This results in multiple skin lesions that often have variable shapes and appear throughout different areas of the skin.

How to differentiate Lyme disease from other causes of fever and rash.

While viral illnesses and other bacterial infections can cause symptoms of fever, fatigue, and pain that mimic Lyme disease, they do not have large distinct round or oval rashes like Lyme disease. In addition, most viral illnesses have typical cold symptoms of runny nose or prominent cough which are not common in Lyme disease.

Michigan's Five Most Common Ticks



1. American dog tick (*Dermacentor variabilis*)

Distribution: Widespread throughout Michigan forests and grassy areas

Key Facts: These ticks are active from early May-November, and will bite both humans and companion animals.

Diseases: Diseases associated with the American dog tick are rare in Michigan, but may include [Rocky Mountain spotted fever](#) and [tularemia](#).



2. Blacklegged tick (*Ixodes scapularis*)

Distribution: Emerging in Michigan, see map at right **Key Facts:** Found on low forest vegetation, often along human and animal trails.

Diseases: [Lyme disease](#) is the most common tick-borne **disease** in Michigan. Other rare diseases include: [anaplasmosis](#), [babesiosis](#), [deer-tick virus](#), and [ehrlichiosis](#).



3. Lone star tick (*Amblyomma americanum*)

Distribution: Occasionally found in wooded and grassy areas across the state

Key Facts: An aggressive biter of humans and companion animals, adult females have distinctive "Lone Star" mark

Diseases: [Ehrlichiosis](#), [rocky mountain spotted fever](#), [tularemia](#)



4. Woodchuck tick (*Ixodes cookei*)

Distribution: Found most commonly on pets throughout Michigan

Key Facts: Usually found near dens of skunks and woodchucks, will bite companion animals near animal dens and occasionally humans **Diseases:** [Powassan encephalitis](#)



5. Brown dog tick (*Rhipicephalus sanguineus*)

Distribution: Occasionally found in Michigan.

Key Facts: can uniquely survive and breed in indoor environments, has been associated with kennel, shelter, and breeding facilities. Good hygiene practices can prevent indoor infestations.

Diseases: [Rocky mountain spotted fever](#), [canine babesiosis](#), [canine ehrlichiosis](#)