

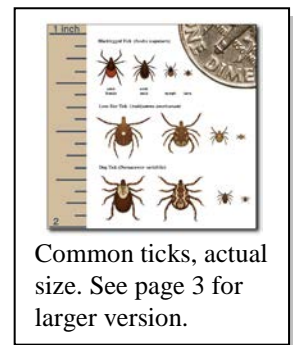
# Preventing Tick Bites and Tick-borne Disease

What supervisors and workers need to know

## ***Recommendations for supervisors***

Supervisors of employees who work in tick habitats should protect their workers from tick-borne disease by taking these steps:

- **Training** – Provide training for workers that includes information about the following:
  - How tick-borne disease is spread;
  - The risks of exposure and infection;
  - How workers can protect themselves from ticks; and,
  - The importance of reporting workplace illnesses and injuries in a timely manner.
- **Clothing**
  - Recommend that workers wear light-colored clothing, including long-sleeved shirts, long pants, socks, and hat when possible. Dark ticks can most easily be spotted against a light background.
  - If worker uniforms are provided, provide long-sleeved shirts and long pants as options.
- **Repellents**
  - Provide workers with repellents (containing 20% to 30% DEET) to use on their skin and clothing for protection against tick bites.
  - Provide workers with repellents (such as Permethrin) to provide greater protection. Permethrin kills ticks shortly after contact. It can be used on clothing but not skin. Allow several hours for treating and drying clothes before use.
- **Administrative and worksite controls**
  - Have tweezers available for tick removal.
  - Avoid working at sites with woods, bushes, tall grass, and leaf litter when possible.
  - When avoiding these sites is not possible, personal protective measures are of particular importance.



## ***Recommendations for workers***

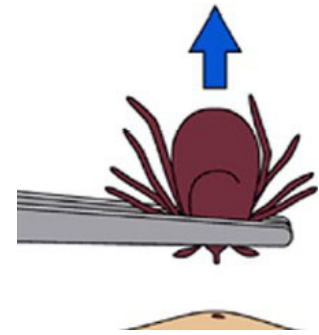
Take the following steps to protect yourself from tick bites:

- **Clothing**
  - Wear light-colored long-sleeved shirts, long pants, socks, and hat when possible. Dark ticks can most easily be spotted against a light background.
  - Tuck your pant legs into your socks. Tuck your shirt into your pants. Ticks grab onto feet and legs and then climb up. This precaution will keep them on the outside of your clothes, where they can be spotted and picked off.
  - Ticks are usually located close to the ground, so wearing high rubber boots may provide additional protection.
  - If possible, do not wear work clothing home. This will reduce the chances of bringing ticks home and exposing family members.
- **Repellents**
  - Follow repellent label directions for use. Application to shoes, socks, cuffs and pant legs are most effective against ticks.

- Use repellents containing 20%-30% DEET on your exposed skin and clothing every day to prevent tick bites. Reapply DEET as recommended on the label.
- Use repellents such as Permethrin for greater protection. Permethrin kills ticks on contact. *Permethrin can be used on clothing but should not be used on skin.* One application of permethrin typically stays effective through several washings. Allow several hours for treating and drying clothes before use.

- **Inspection, hygiene, and removal**

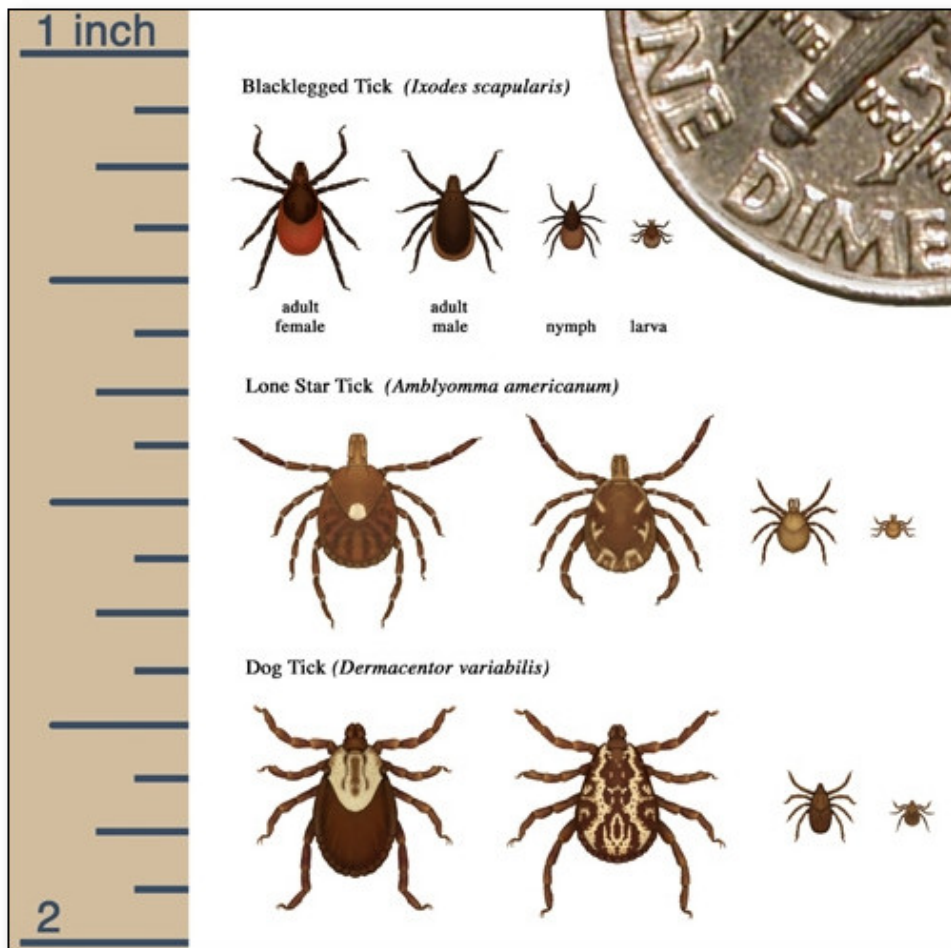
- Check your skin and clothes for ticks often while in tick habitat. The immature forms of these ticks are very small and may be hard to see. Have a coworker check your back.
- Shower or bathe as soon as possible after working outdoors to wash off and check for ticks. Have a companion check your back, or use a mirror.
- Remember to check your hair, underarms, and groin for ticks.
- Removal – Chances of contracting disease are greatly reduced if the tick is removed within the first twenty-four hours. To remove a tick, follow these steps:
  1. Using a pair of pointed precision tweezers,<sup>1</sup> grasp the tick by the head or mouthparts right where they enter the skin. Do not grasp the tick by the body.
  2. Without jerking, pull firmly and steadily directly outward. 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. DO NOT apply petroleum jelly, a hot match, alcohol, or any other irritant to the tick in an attempt to get it to back out.
  4. Clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.
  5. Report the tick to your supervisor. See Reporting below.
- After washing work clothes, dry them on hot cycle to kill any ticks present.
- Learn the symptoms of tick-borne diseases (see page 4).
- If you develop symptoms of a tick-borne disease seek medical attention promptly. Be sure to tell your medical provider that you work outdoors in an area where ticks may be present.



- **Reporting** – This is how an employee should report a **work-related** tick problem.

I found a tick (not embedded) on my clothes/body during work.	<i>Tell or email supervisor the first time you find a tick at a worksite each season. Keep your supervisor generally informed about the ticks you encounter.</i>
I found/removed a tick that bit me.	<i>Email your supervisor ASAP to document the exposure. Provide the date and work site of the exposure, and general location on body of the bite.</i>
I have symptoms matching those of a tick-borne disease, and I believe that my job duties in tick habitat caused the exposure.	<ul style="list-style-type: none"> <li>•<i>Fill out an Employees First Report of Injury and Illness form, and give it to your supervisor.</i></li> <li>•<i>See your physician / medical provider; tell them that you believe this was work-related.</i></li> </ul>

<sup>1</sup> Keep in mind that certain types of fine-pointed tweezers, especially those that are etched, or rasped, at the tips, may not be effective in removing nymphal deer ticks. Choose unrasped fine-pointed tweezers whose tips align tightly when pressed firmly together.



This image includes two of the ticks commonly found in Wisconsin, the blacklegged (or deer) tick and the dog (or wood) tick. In Wisconsin, the blacklegged tick can transmit:

- Lyme disease,
- anaplasmosis,
- babesiosis, and
- Powassan virus infection (a rare tickborne arbovirus illness)

Blacklegged ticks have a two-year lifecycle, which includes egg, larva, nymph, and adult stages. During this life cycle, the tick will have three blood meals and usually feed on small mammals, birds, and deer. Ticks feed by inserting their mouthparts into the skin of a host, and during this time, infections may be transmitted to the tick or the host. Once attached to a host, ticks will generally feed for 3-5 days. Usually only nymphs and adult female ticks are able to transmit most human tickborne diseases.

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*This guidance is provided to University of Wisconsin System institutions for occupational health protection of employees. Information for this guidance was provided by the Centers for Disease Control and Prevention, Wisconsin Department of Health, and Wisconsin Department of Natural Resources.*

*University of Wisconsin System Administration, Office of Risk Management, June 2014.*

# Characteristics of Tickborne Diseases in Wisconsin



Disease	Etiologic agent	Reservoir	Vector	Incubation range (average)	Clinical Symptoms	Available tests	Treatment (IDSA guidelines)
<b>Anaplasmosis (formerly known as HGE)</b>	<i>Anaplasma phagocytophilum</i>	Mammals- (white footed-mouse, deer)	<i>Ixodes</i> sp. tick (blacklegged/deer tick)	5-21 days (14days)	Headache, fever, chills, muscle aches, fatigue, nausea, cough, confusion, rash (rare), thrombocytopenia, leukopenia, elevated liver enzymes	IFA IgG/IgM, PCR, smear culture, IHC	Antibiotics (doxycycline) usually 10-14 days
<b>Babesiosis</b>	Typically <i>Babesia microti</i> (parasitic)	Small mammals- (white footed-mouse)	<i>Ixodes</i> sp. tick (blacklegged/deer tick)	Typically 7-21 days	Fever, chills, sweats, headache, body aches, loss of appetite, involuntary weight loss, nausea, fatigue, anemia, thrombocytopenia	Blood smear, PCR, IFA	Combination of two medications: atovaquone + azithromycin, or clindamycin + quinine (at least 7-10days)
<b>Ehrlichiosis (formerly known as HME)</b>	<i>Ehrlichia chaffeensis</i> , novel <i>Ehrlichia muris</i> -like (EML)	Mammals- (white footed-mouse, deer)	<i>Amblyoma</i> , <i>Ixodes</i> sp. tick ( <i>E. chaffeensis</i> - lone star tick)* (EML- blacklegged tick)	1-14 days (7days)	Headache, fever, chills, muscle aches, fatigue, nausea, vomiting, cough, joint pain, confusion, occasional rash, thrombocytopenia, leukopenia, elevated liver enzymes	IFA IgG/IgM, PCR, smear culture, IHC (PCR is the only commercial test available for EML)	Antibiotics (doxycycline) usually 10-14 days
<b>Lyme</b>	<i>Borrelia burgdorferi</i>	Mammals- (white footed-mouse, deer)	<i>Ixodes</i> sp. tick (blacklegged/deer tick)	Usually within 3-30 days	Expanding erythma migrans (EM) rash, fatigue, chills, fever, headache, muscle and joint aches, arthritis, nervous system (facial palsy, radiculoneuropathy, lymphocytic meningitis), memory problems, irregular heart rhythm (rare)	EIA/IFA and WB**, PCR, culture	Oral antibiotics (doxycycline, amoxicillin, cefuroxime axetil) usually 14days
<b>Powassan</b>	Powassan virus (arbovirus group)	Small mammals- (woodchucks, groundhogs, white-footed mouse, chipmunks, and squirrels)	<i>Ixodes</i> sp. tick (blacklegged/deer tick)	8-34 days (21 days)	fever, muscle weakness, headache, nausea, vomiting, stiff neck, blurry vision, confusion, encephalitis, meningitis, seizures, gait imbalance, paralysis, respiratory distress, coma	MAC-ELISA, PRNT (no commercial test, available only at CDC)	None (supportive treatment)
<b>Spotted fever group rickettsia, including Rocky mountain spotted fever (RMSF)</b>	<i>Rickettsia rickettsii</i> (reported cases usually associated with travel to an endemic state)	Rodents	<i>Dermacentor</i> sp. tick (American dog tick)	2-14 days	Fever, rash, headache, nausea, vomiting, abdominal and muscle pain, lack of appetite, conjunctival injection (red eyes)	IFA, IHC, PCR	Antibiotics (doxycycline) usually 10-14 days

\* Uncertain if lone star tick ecology is established in WI

\*\* Two-step or two-tier testing should be performed together, see CDC recommendation

<http://www.cdc.gov/lyme/diagnosis/treatment/LabTest/>