

## Monitoring Monday - Let's look at tick bite prevention.

Join us each Monday as the Clean Water Team shares resources on water quality monitoring. This Monday we look at tick bite prevention.

Ticks are small crawling invertebrates that are related to spiders and mites. These parasitic arachnids feed on the blood of humans and animals to survive. Ticks are implicated in the transmission of several infections caused by pathogens such as bacteria, viruses, and protozoa. Ticks are one of the organisms commonly called vectors (carriers) because they can feed on a disease-infected animal (such as a mouse), then carry and transmit the disease to the next animal or person they bite. While the peak season for Lyme disease is summer, the ticks that transmit it are active most of the year. Workers and volunteers that are active in areas known to harbor ticks should be informed and take necessary precautions to prevent tick bites.

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### TICK-BORNE DISEASE IN CALIFORNIA

**Lyme Disease** - This is a bacteria disease and is the #1 tick-born disease in California. There is an average of 200 cases of Lyme disease reported in California each year.

Lyme disease is a potentially serious disease and can be localized or affect multiple body systems. In the United States, the disease is caused almost exclusively by the spirochete *Borrelia burgdorferi*, a corkscrew-shaped bacterium. Five additional species of Lyme disease-group spirochetes have been described from California, but only one of them, *Borrelia bissettii*, has been found to occasionally infect people.

Lyme disease spirochetes are transmitted to humans and other animals by the feeding activities of certain ticks. Of the 48 tick species established in California, 6 species attach to humans with some regularity, but only nymphs (an immature tick life-stage) and adult females of the western blacklegged tick, *Ixodes pacificus*, transmit *Borrelia burgdorferi* to people. A closely related tick species, the blacklegged or deer tick (*Ixodes scapularis*), transmits *B. burgdorferi* in eastern North America, but that tick does not occur in California.

Certain California counties pose a much higher risk of contracting Lyme disease than others. For example, the highest average incidence from 2005 to 2014 occurred in the northwestern counties of Trinity (4.5), Humboldt (3.9), and Mendocino (3.9), as well as in the northern Sierra-Nevada counties of Sierra (3.2) and Nevada (2.7). These county estimates vary slightly due to year-to-year variation in reporting, but the patterns of risk remain similar.

- **Lyme Disease in California**  
<http://ipm.ucanr.edu/PMG/PESTNOTES/pn7485.html>
- **Lyme Disease in California: Story, maps, and data**  
<https://storymaps.arcgis.com/stories/f64d0c19a3ab42cf90e8ce38397e96e0>
- **California Study Finds Lyme Disease-Carrying Ticks by the Beach**

[www.smithsonianmag.com/smart-news/california-study-finds-disease-carrying-ticks-beach-180977599/](http://www.smithsonianmag.com/smart-news/california-study-finds-disease-carrying-ticks-beach-180977599/)

- **Lyme Disease Fact Sheet**  
<https://www.osha.gov/sites/default/files/publications/lymefac.pdf>
- **LymeDisease.org** is a small grass-roots organization in Ukiah, California. Today, we are one of the most trusted sources of information by patients.  
[LymeDisease.org](http://LymeDisease.org)
- **Global Lyme Alliance** is dedicated to conquering Lyme and other tick-borne diseases through research, education, awareness, and patient services.  
[www.globallymealliance.org/about-gla/](http://www.globallymealliance.org/about-gla/)

#### Other Pathogens Carried by Ticks That Can Also Cause Human Disease:

- **Anaplasmosis** is transmitted to humans by tick bites primarily from the blacklegged tick (*Ixodes scapularis*) in the northeastern and upper midwestern U.S. and the western blacklegged tick (*Ixodes pacificus*) along the Pacific coast.
- **Babesiosis** is caused by microscopic parasites that infect red blood cells. Most human cases of babesiosis in the U.S. are caused by *Babesia microti*. *Babesia microti* is transmitted by the blacklegged tick (*Ixodes scapularis*) and is found primarily in the northeast and upper midwest.
- **Borrelia mayonii** infection has recently been described as a cause of illness in the upper midwestern United States. It has been found in blacklegged ticks (*Ixodes scapularis*) in Minnesota and Wisconsin. *Borrelia mayonii* is a new species and is the only species besides *B. burgdorferi* known to cause [Lyme disease](#) in North America.
- **Borrelia miyamotoi** infection has recently been described as a cause of illness in the U.S. It is transmitted by the blacklegged tick (*Ixodes scapularis*) and has a range similar to that of Lyme disease.
- **Bourbon virus** infection has been identified in a limited number patients in the Midwest and southern United States. At this time, we do not know if the virus might be found in other areas of the United States.
- **Colorado tick fever** is caused by a virus transmitted by the Rocky Mountain wood tick (*Dermacentor andersoni*). It occurs in the the Rocky Mountain states at elevations of 4,000 to 10,500 feet.
- **Ehrlichiosis** is transmitted to humans by the lone star tick (*Amblyomma americanum*), found primarily in the southcentral and eastern U.S. Ehrlichiosis (HME and HGE) - Both forms of Ehrlichiosis, Human Monocytic Ehrlichiosis (HME) and Human Granulocytic Ehrlichiosis (HGE) are caused by rickettsia-like organisms and are rare in California. The first known case of HGE in the western United States occurred in 1994. In 1995, the confirmation of two cases of HME in California represented the first cases contracted in the western United States.
- **Heartland virus** cases have been identified in the Midwestern and southern United States. Studies suggest that Lone Star ticks can transmit the virus. It is unknown if the virus may be found in other areas of the U.S.
- **Lyme disease** is transmitted by the blacklegged tick (*Ixodes scapularis*) in the northeastern U.S. and upper midwestern U.S. and the western blacklegged tick (*Ixodes pacificus*) along the Pacific coast.
- **Powassan disease** is transmitted by the blacklegged tick (*Ixodes scapularis*) and the groundhog tick (*Ixodes cookei*). Cases have been reported primarily from northeastern states and the Great Lakes region.

- [\*Rickettsia parkeri rickettsiosis\*](#) is transmitted to humans by the Gulf Coast tick (*Amblyomma maculatum*).
- [Rocky Mountain spotted fever \(RMSF\)](#) is transmitted by the American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), and the brown dog tick (*Rhipicephalus sanguineus*) in the U.S. The brown dog tick and other tick species are associated with RMSF in Central and South America.
- [STARI \(Southern tick-associated rash illness\)](#) is transmitted via bites from the lone star tick (*Amblyomma americanum*), found in the southeastern and eastern U.S.
- [Tickborne relapsing fever \(TBRF\)](#) is transmitted to humans through the bite of infected soft ticks. TBRF has been reported in 15 states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, New Mexico, Ohio, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming and is associated with sleeping in rustic cabins and vacation homes.
- [Tularemia](#) is transmitted to humans by the dog tick (*Dermacentor variabilis*), the wood tick (*Dermacentor andersoni*), and the lone star tick (*Amblyomma americanum*). Tularemia occurs throughout the U.S.
- [364D rickettsiosis](#) (*Rickettsia phillipi*, proposed) is transmitted to humans by the Pacific Coast tick (*Dermacentor occidentalis* ticks). This is a new disease that has been found in California.

[www.cdc.gov/ticks/diseases/index.html](http://www.cdc.gov/ticks/diseases/index.html)

<https://vector.sccgov.org/sites/g/files/exjcpb676/files/1580-Tick-borne-Disease-in-CA- by-SCCVCD-FullPageView.pdf>

## PREVENTING TICK BITES

The most important consideration in reducing tick encounters is the use of personal protection strategies. By taking a few simple precautions, you can significantly reduce your exposure to ticks.

- Know where to expect ticks. In general, ticks are found wherever their host species occur. Usually ticks can be found in grassy, brushy, or wooded areas, or even on animals. Spending time outside walking your dog, camping, gardening, or hunting could bring you in close contact with ticks.
- Treat clothing and gear with products containing 0.5% permethrin. Permethrin can be used to treat boots, clothing and camping gear and remain protective through several washings. Alternatively, you can buy permethrin-treated clothing and gear.
- Use [Environmental Protection Agency \(EPA\)-registered insect repellents](#) containing DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. EPA's helpful [search tool](#) can help you find the product that best suits your needs. Always follow product instructions. Do not use products containing OLE or PMD on children under 3 years old.
- Wear protective clothing such as shirts with long sleeves. Long pants should be tucked into socks, & shoes. Avoid going barefoot or wearing open-toe sandals/shoes.
- When you're done enjoying the out of doors, it's a good protective habit to shower immediately. This may wash off ticks that have gotten onto you. Wash and dry your clothes immediately.
- Perform tick checks after coming in from the out of doors and showering.
- Avoid Contact with Ticks
  - Avoid exposure in wooded, overgrown areas.
  - Stay out of tall grass & un-cleared areas of the forest floor.
  - Stay on marked trails when hiking. And walk in the center of trails.

## Tips to Prevent Tick Bites and Getting Lyme Disease | Johns Hopkins Medicine (Video)

[www.youtube.com/watch?v=ENmVXtwsKE8](https://www.youtube.com/watch?v=ENmVXtwsKE8)

## California Workplace Tick Bite Prevention

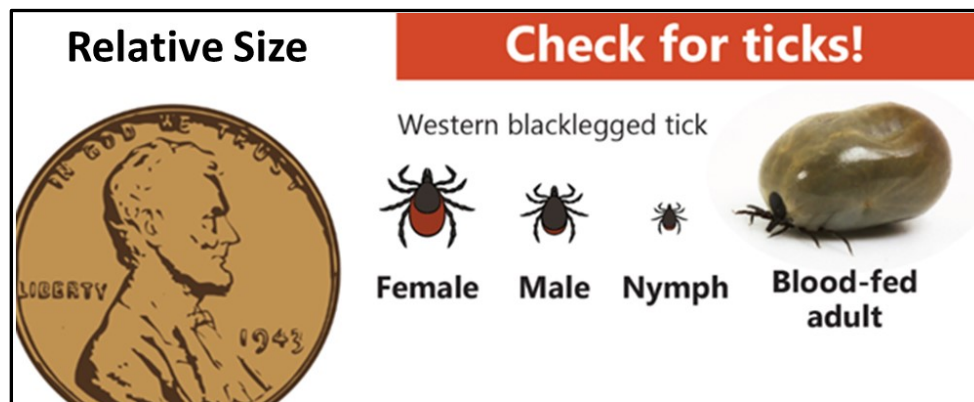
<https://www.youtube.com/watch?v=ieBN9p5Gtms>

[www.cdc.gov/ticks/avoid/on\\_people.html](http://www.cdc.gov/ticks/avoid/on_people.html)

[www.hopkinslyme.org/lyme-education/5-tips-for-preventing-tick-bites-and-lyme-disease/](http://www.hopkinslyme.org/lyme-education/5-tips-for-preventing-tick-bites-and-lyme-disease/)

## TICK IDENTIFICATION

While there are hundreds of species of ticks around the world, the majority of tick-borne diseases transmitted to humans and pets are carried by three main tick groups: blacklegged ticks (including the deer tick), dog ticks, and lone star ticks. You can use [this chart](#) to identify the five most common variations of these tick types.



Adapted from [www.sandiegocounty.gov/deh/pests/lyme\\_disease.html](http://www.sandiegocounty.gov/deh/pests/lyme_disease.html)

## TICK BITE: WHAT TO DO

**You can reduce your chances of infection or other injuries by searching for, and promptly removing, attached ticks.**

1. Use fine-tipped tweezers to grasp the tick as close to the skin as you can.
2. Pull upward with steady, even pressure. Don't twist or jerk the tick.
3. After removing the tick, clean the bite area and your hands with rubbing alcohol or soap and water.
4. Dispose of the tick by flushing it down the toilet. If you would like to bring the tick to your healthcare provider for identification, put it in rubbing alcohol or place it in a sealed bag/container.

[www.cdc.gov/ticks/removing\\_a\\_tick.html](http://www.cdc.gov/ticks/removing_a_tick.html) (PDF English)

[www.cdc.gov/ticks/es/removing\\_a\\_tick\\_sp.html](http://www.cdc.gov/ticks/es/removing_a_tick_sp.html) (PDF Spanish)

## TICK BITE FOLLOW-UP

If you develop a rash or fever within several weeks of removing a tick, see your doctor:

- Tell the doctor about your recent tick bite,

- When the bite occurred, and
- Where you most likely acquired the tick.

#### OTHER RESOURCES:

- **Epidemiology and Prevention of Tick-Borne Diseases in California: Information for Physicians and Other Healthcare and Public Health Professionals**  
<https://westnile.ca.gov/pdfs/EpidemiologyandPreventionofTBDinCA.pdf>
- **Hazard Information Bulletin** - This bulletin provides guidance for workers and employers about how to decrease the risk of Lyme disease in individuals who may be potentially exposed on the job to Lyme disease causing ticks.  
<https://www.osha.gov/sites/default/files/publications/shib021103.pdf>

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