



Public Health Information Sheet

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Web Resources

NPS Public Health:
[http://www.nps.gov/public_](http://www.nps.gov/public_health/)
[health/](http://www.nps.gov/public_health/)

CDC:
<http://www.cdc.gov>

**State and Local Health
Departments:**
[http://www.cdc.gov/mmwr/i](http://www.cdc.gov/mmwr/international/relres.html)
[nternational/relres.html](http://www.cdc.gov/mmwr/international/relres.html)

Ticks and Disease

Few pests elicit the negative response of ticks. Because of their persistent blood-sucking behavior, they transmit several potentially debilitating and life-threatening diseases.

Lyme disease, in particular, has attracted national attention and is now the number one arthropod-borne disease in the United States.

Other tick-transmitted diseases include Rocky Mountain Spotted Fever, Ehrlichiosis and Babesiosis. Ticks prefer to lie in woods, tall grass, weeds and brush. They are seldom a problem in well-maintained lawns although edges of property supporting tall weeds and brush can be a source of infestation.

Lyme disease is the most common arthropod-borne disease in the U.S. The deer tick is responsible for lyme disease in the northeast and in the north central states, and the black legged tick in the west. The disease most commonly occurs during the summer months when ticks are most active; however, the symptoms of chronic, untreated Lyme disease can occur at any time of the year. There are three areas where risk of getting the disease is much greater than elsewhere. the northeast states of Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania; the north central states of Wisconsin and Minnesota; and finally the Pacific Coast states of California and Oregon. A characteristic rash or lesion develops a few days to a few weeks after the bite of an infected tick. The rash generally looks like an expanding red ring with a clear center, but it can vary from a blotchy appearance to red throughout. Sometimes there are two or more lesions. Sometimes patients never get a rash, making diagnosis difficult. At about this time, flu-like symptoms may appear along with headache, stiff neck, fever, muscle aches, and/or general malaise. Some symptoms and signs of Lyme disease may not appear until weeks, months, or years after a tick bite. Arthritis is most likely to appear as brief bouts of pain and swelling, usually in one or more large joints, especially the knees. Nervous system abnormalities can include numbness, pain, Bell's palsy (paralysis of the facial muscles, usually on one side), and meningitis (fever, stiff neck, and severe headache). Less frequently, irregularities of the heart rhythm occur. In some persons the rash never forms; in some, the first and only sign of Lyme disease is arthritis, and in others, nervous system problems are the only evidence of Lyme disease.

Human ehrlichioses are two fairly recently identified tickborne diseases of man. Human monocytic ehrlichiosis is transmitted primarily by the Lone Star tick. Most cases have occurred in the southeast and south central U.S. Cases have also been confirmed in Washington State and Massachusetts. Human granulocytic is transmitted to humans by the deer tick. Most cases have occurred in the upper Midwest (Minnesota and Wisconsin). A few additional cases were identified in New York, Connecticut, Maryland, and California. Both diseases are clinically similar to Lyme disease in their "flu-like" symptoms including fever, headache, fatigue, and muscle pain. They differ from Lyme disease in their rapid onset of these symptoms, especially elevated fever accompanied by very severe headache. Human ehrlichioses also differ from Lyme disease in the absence of the characteristic rash around the tick bite. Infection usually produces mild to moderately severe illness but may occasionally be life threatening or even fatal. The incubation period is usually one to three weeks after exposure to an infected tick. However, not every exposure results in infection.

Babesiosis is transmitted to man by the deer tick. Cases of this disease have been reported during spring, summer, and fall in coastal areas in the northeastern United States, especially Nantucket Island off the Massachusetts shore and on Long Island, New York. Cases have also been reported in Wisconsin, California, and Georgia. Symptoms, if any, usually begin within one week of being bitten. Most people who are infected have no apparent symptoms. For those that do have symptoms, there is a gradual onset of not feeling well with loss of appetite and fatigue. As the disease progresses fever, drenching sweats, muscle aches and headache may be experienced. Some individuals a serious sometimes fatal disease with hemolytic anemia., kidney failure, liver dysfunction and/or very low blood pressure. Symptomatic babesiosis is seen most frequently in the elderly and immuno-

Rocky Mountain Spotted Fever occurs primarily along the southern Atlantic Coast although cases also occur in the mid-west through the Rocky Mountain States and on to the Pacific Coast. Most cases occur between April and September. Three ticks commonly transmit the disease to man; the Rocky Mountain wood tick in the west; the American dog tick in the east and in parts of the Pacific Coast; and the lone star tick in parts of the Eastern U.S. and in Texas, Oklahoma, and Arkansas. About 3 to 10 days after tick attachment, the disease starts with a definite fever, often with chills, headache, or muscle aches. A rash usually appears after 1-3 days of fever, usually on the wrists and ankles. At first the rash resembles that of measles. Later the rash may spread to the rest of the body. Because they are more likely to be exposed to ticks, children living in rural and suburban areas and children attending youth camps are likely to become infected. The disease is severe at all ages, but it is more severe in adults, especially the elderly.

Tickborne paralysis is a potentially fatal reaction to a paralyzing toxin secreted in the saliva of a female tick during the late stages of feeding. Vectors of this illness include the Rocky Mountain wood tick (*Dermacentor andersoni*), the American dog tick (*Dermacentor variabilis*), the Lone Star tick (*Amblyomma americanum*), *Amblyomma maculatum*, *Ixodes scapularis* (black-legged tick), and *Ixodes pacificus* (western black-legged tick).

Signs and symptoms of this illness include: headache, vomiting, general feeling of exhaustion and loss of motor function and reflexes. These symptoms are followed by a paralysis that starts in the lower body and spreads to the rest of the body. The paralysis can cause respiratory failure and death results in approximately 10% of cases.

The illness is most commonly found in the Rocky Mountain and northwest regions of the United States and western Canada.

Tickborne Relapsing Fever (TBRF) is a systemic disease in which periods of fever lasting 2-9 days alternate with periods of no fever, which last for 2-4 days. These relapses can vary from 1 to 10 or more. A rash may be present during the fever periods. The average incubation period is eight (8) days; with a range of 5-15 days. The total duration of the disease averages 13-16 days. Approximately 2% to 10% of untreated cases can result in death.

TBRF is endemic throughout much of the western United States, with sporadic cases occurring each summer and fall. The disease is caused by infection with the spirochetes *Borrelia hermsii* or *B. turicatae*. The soft ticks of the genus *Ornithodoros*, which transmit the illness, usually feed on rodents and frequently infest rodent nesting material. The ticks are reclusive, usually feeding at night for only 5-20 minutes. Their bites are painless and frequently go unnoticed. Humans are incidental hosts when bitten by an infected tick. Cabins in wilderness areas are attractive nesting sites for potentially infected rodents, particularly when food is made available by cabin users. Most infections are acquired by persons vacationing in mountain cabins where rodents have nested.

It is important to seek medical attention if you suspect you have been bitten by a tick and especially if you are experiencing any of these symptoms of the above mentioned diseases. Timely treatment is essential.

In some areas ticks saved in a sealed container can be submitted to the local health department for identification.

The best way to avoid acquiring ticks and tick-borne diseases is through prevention.

- Avoid tick-infested areas, especially in spring and summer months.
- Stay on the center of trails and paths - don't brush against vegetation if you can avoid it.
- Wear long pants, and tuck in your pants legs. Better still, tape the area where pants and socks meet.
- Wear a hat and a long-sleeved shirt for extra protection.
- Wear light colored and tightly woven clothing to more easily see ticks.
- Use insect repellent. Products containing DEET can be used on either skin or clothing. Permethrin can be used only on clothing. Both are readily available.
- Frequently check yourself, children and pets for ticks. Ixodid ticks are about the size of a pinhead, therefore easily overlooked. Other ticks are larger, about the size of a pencil eraser or larger.
- Remove ticks from your skin immediately with tweezers by grasping the tick's head parts as close to your skin as possible. If mouthparts remain embedded in skin, contact your physician. Wash the bite area, apply antiseptic and cover with a band-aid. Ticks are slow feeders. Risk of infection is greatly reduced if they are removed within 24 hours.
- Where possible, keep grass and shrubs in your yard trimmed, and clear overgrowth.
- Treating lawns is of little benefit since this is not a preferred habitat for ticks.

REFERENCES

Health Information, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Department of Health and Human Services.

If you have any questions, please contact a Regional Public Health Consultant, park sanitarian or call WASO Public Health.

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