



LYME DISEASE

What is Lyme Disease?

Lyme disease is an infectious disease transmitted by the bite of a tick. It is caused by a spirochete bacterium, known as *Borrelia burgdorferi*, that may persist in the human body for several years if not properly treated with antibiotics. The natural history of this disease is not completely understood and the illness it produces takes many forms. Because of varied symptoms, diagnosis can be difficult. This newly recognized disease was first noted in 1975 at Old Lyme, Connecticut, and was first seen in California in 1978.

The Vector of Lyme disease in California

The western black-legged tick (*Ixodes pacificus*) is the only tick of the 48 species occurring in California that is known to transmit Lyme disease. The spirochete causing Lyme disease was first isolated from this tick in 1984.

The tick has three active stages: Immature stages (larvae and nymphs) feed on small rodents, rabbits, lizards, birds, and occasionally large mammals. Adults feed on large mammals, including deer, dogs, and humans. All stages feed by imbedding their mouthparts into the skin of a host and taking a blood meal.

Studies indicate that wood rats (*Neotoma* species) serve as the primary reservoir host, and together with another nonhuman-biting *Ixodes* tick, maintain the agent of Lyme disease in nature. Larval and nymphal ticks acquire spirochetes from blood of infected mammals as they feed; the infected nymphs and adults transmit the spirochetes to other mammals (including humans). Approximately 24 to 72 hours of attachment is necessary for transmission of the Lyme disease spirochete to occur. In California a low percentage of the ticks are infected with the Lyme disease spirochete.

Adult ticks are most commonly found from October through June (winter/spring), during the period of the year when humidity is usually high. The adult female is red-brown with black legs, about 1/8 of an inch long; males are smaller and entirely brownish-black. Both are teardrop shaped. The western black-legged tick has been reported from 55 of the 58 California counties, but is most common in the humid coastal areas and on the western slopes of the Sierra Nevada range.

This tick can be found on grasses and low vegetation in both urban and rural settings. Ticks do not fly, jump, or drop from trees. Instead they climb to the tips of vegetation, typically along animal trails or paths, and wait for a host to brush against them. This behavioral method of finding a host is known as questing.

Recent studies implicate nymphs as the stage responsible for transmitting most Lyme disease cases in the western U.S. Nymphs are active primarily March through August (spring/summer) and are found mainly in shaded leaf litter. However, because human cases of Lyme disease occurred during the months of the year when only adult stage of *I. pacificus* is present, the importance of this stage should not be overlooked.



Lyme disease in Riverside County

The Vector Control Program, in collaboration with the State Department of Health Services Vector-Borne Disease Section, actively conducts Lyme disease surveillance throughout the unincorporated territory of Riverside County. Although the western black-legged tick is present in Riverside County, all ticks tested for the causative spirochete have been negative thus far. However, a tick collected in the year 2000 from the San Jacinto Mountain region did test positive for a subspecies of *Borrelia* known to cause Relapsing Fever.

Symptoms

➤ *Early Lyme Disease*

The early stage of Lyme disease is usually characterized by one or more of the following symptoms and signs:

- Fatigue
- Chills and fever
- Headache
- Muscle and joint pain
- Swollen lymph nodes
- A characteristic skin rash, called erythema migrans

Erythema migrans (EM) is a red, blotchy, circular, expanding rash that may grow to several inches in diameter and clears centrally, producing a ring-like appearance. EM usually occurs 3 to 30 days after the bite of an infected tick in 60-80% of patients. One or more EM lesions may occur, not necessarily at the tick bite site. EM may be preceded or accompanied by flu-like symptoms. These symptoms may persist, change, disappear and reappear intermittently for several weeks.

➤ *Late Lyme disease*

Some symptoms and signs of untreated 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 occurs; 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.

What to do if you think you have Lyme disease

Early recognition of Lyme disease is important. If you find a tick attached to your skin, or if you were in an area where ticks are known to occur and develop any of the symptoms listed in this bulletin, consult your physician. Treatment with antibiotics during the early stages can cure the infection and prevent complications associated with late Lyme disease. Antibiotic treatment of late stage Lyme disease is usually, but not always, successful.

*Document available in an alternate format upon request