LYME DISEASE AND OTHER TICK-BORNE DISEASES IN CALIFORNIA

Inform your physician immediately if you develop any of the symptoms listed in this brochure after finding a tick attached to your skin or being in an area where ticks are known to occur. The Western black-legged tick and other similar ticks in California may be infected with microbes that cause other diseases. These diseases include ehrlichiosis, babesiosis, Rocky Mountain spotted fever, Colorado tick fever, anaplasmosis, and tularemia. Early diagnosis and treatment of all these diseases is important.

All cases of tick-borne diseases are reportable to the California Department of Public Health by physicians via their county health department.

Additional information on Lyme disease and other tick-borne diseases can be obtained from the agency named in the box below, or by contacting the California Department of Public Health.

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LYME DISEASE IN CALIFORNIA

This brochure provides information on Lyme disease, the ticks that carry this disease in California, and measures you can take to protect yourself.

Lyme disease is caused by a spirochete (a corkscrew-shaped bacteria) called Borrelia burgdorferi and is transmitted by the western black-legged tick. Lyme disease was first described in North America in the 1970s in Lyme, Connecticut, the town for which it was then named. This disease has since been reported from many areas of the country, including most counties in California.

SYMPTOMS OF LYME DISEASE

Many body systems can be affected by Lyme disease. Symptoms vary from person to person and can come and go. Symptoms are generally classified into early or late. Early symptoms occur days to weeks after a person becomes infected. Early symptoms include:

- Flu-like symptoms such as muscle aches, joint pain, fatigue, headache, stiff neck, chills, fever, or swollen lymph nodes.
- Paralyzed muscles of the face.
- Palpitations (common) or disturbances of heart rhythm (rare).
- An expanding rash called erythema migrans, or EM. The EM appears 1-30 days after the bite of an infected tick, expands over a one to two week period, and then disappears. More EMs, not necessarily at the site of the tick bite, can show up later. The EM is usually painless. The EM varies in shape and appearance. On dark skin the EM can look more like a bruise. The EM is not present in some people, or it may occur on a part of the body that is difficult to see.

Painful redness that occurs less than 24 hours after a tick bite and does not expand is more likely to be a local allergic reaction to the tick's saliva.

Examples of erythema migrans rashes

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These symptoms can disappear without treatment but the infection may still be present. If early Lyme disease symptoms are not recognized and treated adequately, the disease may progress and be more difficult to treat.

Late symptoms occur weeks, months, or years after becoming infected. **Late symptoms may be the first sign of Lyme disease in some people.** Late symptoms include:

- Numbness, tingling, or burning feelings in arms and legs. Muscles of the face, arms, or legs may twitch or become weak or paralyzed. Sharp pain in the arms, legs, neck, and back, may occur. Increased sensitivity to light may be present.
- Swelling and pain of one or a few joints, especially the knees. Joint swelling sometimes moves from one joint to another, and may come and go.
- Difficulties with memory, concentration, learning, or speech in both children and adults.
- Some Lyme disease patients also experience mood swings, depression, or abnormal thought processes.

DIAGNOSIS AND TREATMENT

People with symptoms of Lyme disease should see their doctor as early as possible. Some tick-borne diseases in California (e.g., anaplasmosis, ehrlichiosis and babesiosis), as well as other diseases, can produce symptoms similar to Lyme disease. Thus, Lyme disease can be difficult to diagnose.

A physician diagnoses Lyme disease based on symptoms. Additional information useful to a physician in making a diagnosis of Lyme disease include:

- Patient had a tick bite or was in an area where ticks occur. Because ticks are small, some people do not notice that they have been bitten.
- Blood tests, but these need to be interpreted carefully.

Prompt treatment with antibiotics during early Lyme disease can cure the infection and prevent complications of late Lyme disease. If treatment is delayed, treatment can be difficult and recovery may take longer.

TRANSMISSION OF LYME DISEASE IN CALIFORNIA

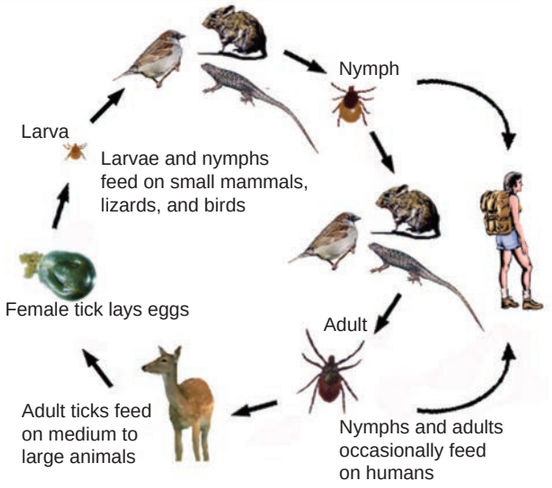
In California, the western black-legged tick (Ixodes pacificus) transmits the bacteria that cause Lyme disease. Western black-legged ticks are most common in the coastal regions and along the western slope of the Sierra Nevada range.

Ticks have three life stages

From left to right: larva, nymph, and adult (male, and female) ticks on a finger. (Photo enlarged to show detail)

Each life stage of the tick attaches to an animal for several days to take one blood meal before maturing to the next stage.

Life cycle of the western black-legged tick



Larvae and nymphs feed on small rodents, lizards, or birds; adults prefer larger animals such as deer. When larvae or nymphs feed on a wild rodent carrying the Lyme disease bacteria, the ticks may become infected and transmit the infection when they feed in the next life stage.

Only nymphs and adult females of the western black-legged tick can transmit Lyme disease bacteria to humans. Nymphs are found in cool moist environments such as in the leaf litter or on logs, tree trunks, or fallen branches under trees in oak woodlands. Adults are found on the tips of grasses and shrubs, often along trails. Ticks do not jump or fly.

Nymphs can pose a greater risk of transmitting Lyme disease bacteria to humans than adults because they are tiny and difficult to see (< 1/20 inch, about the size of a poppy seed), and so may not be removed promptly. Nymphs are most active in spring and early summer, when people are most likely to be outdoors; adult ticks are most active from fall through early spring.

In some areas of California, studies show that a higher percentage of nymphs (average 5-15%, range= 0- 41%) carry the Lyme disease organism compared to adult ticks (average 1-2%, range=0-10%).

PREVENTING LYME DISEASE

If possible, avoid areas where ticks are known to occur. Ask your local vector control agency or health department where ticks are present in your county.

If you are in areas where ticks are found:

Regularly examine yourself for ticks and remove ticks promptly. Frequent tick checks provide the best prevention against Lyme disease.

Wear light colored clothing so that ticks can be seen more easily.

Wear a long-sleeved shirt and tuck shirt into pants; tuck pants into boots or socks.

Apply a tick repellent to clothing. Products with permethrin kill ticks on contact and are applied to clothing only. Products with DEET repel ticks and can be applied to the skin. Always follow directions on the container and be especially careful when applying to children.

Stay on trails and avoid contact with bushes or grasses alongside trails where ticks are common. Control ticks on pets. Pets can bring ticks into contact with humans. Discuss tick control for your pets with your veterinarian.

Actual size of the western black-legged tick

Check your entire body for ticks for several days after you are out of tick habitat. Pay particular attention to the hairline, behind the earlobe, under the arms and breasts, at the beltline, groin, and behind the knees. Parents should carefully examine their children.

TICK REMOVAL

Ticks feed by inserting their mouthparts into the skin and taking a blood meal. Removing ticks promptly can prevent transmission of Lyme disease and other tick-borne diseases. If ticks are removed less than 24 hours after becoming attached, then the chance of getting Lyme disease is very low.

TO REMOVE AN ATTACHED TICK:

Use tweezers to grab the tick as close to your skin as possible.

Pull the tick straight out, using a firm, steady motion; do not jerk the tick.

Do not twist, smother, or burn an attached tick; these are not effective methods for tick removal.

Do not squish an attached tick.

If fingers must be used, protect your fingers with a tissue or plastic bag, grasp the tick as close to the skin as possible, and pull straight out.

Wash your hands and the bite site with soap and water after the tick is removed.

Apply an antiseptic to the bite site.

A localized reaction or infection can occur where the tick was attached. If redness or pain develops at the tick bite site, consult your physician

Tweezers are used to remove attached ticks

(photo enlarged to show detail)