

epiTRENDS

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Lyme Disease

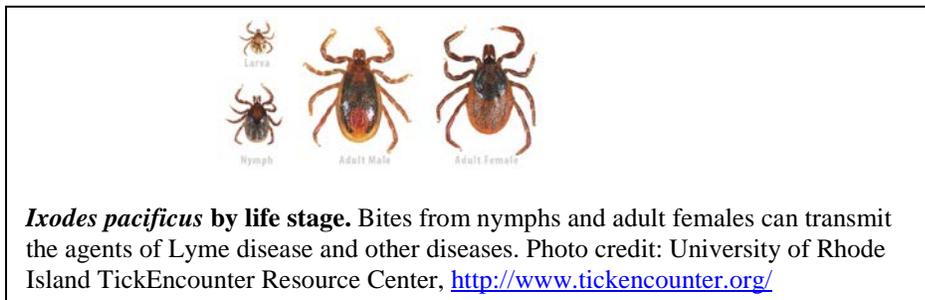
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One downside of Washington's warm-weather season is potential exposure to ticks. Lyme disease, the most commonly reported tick-borne disease in the United States, occurs in the Pacific Northwest. This article reviews clinical and surveillance aspects of Lyme disease in Washington.

Transmission

Borrelia burgdorferi, an extracellular spirochete, causes Lyme disease. Primary *B. burgdorferi* vectors in the United States are *Ixodes pacificus* (Western blacklegged tick) in the Pacific Northwest and *I. scapularis* (blacklegged or deer tick) in central and eastern states. *B. burgdorferi* is maintained in an enzootic cycle involving wild mammals and ticks.

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I. pacificus ticks climb on low-lying vegetation. When they detect potential hosts by carbon dioxide or other cues, they wave their forelegs and attach to passing animals.

An *Ixodes* tick feeds for days, becoming engorged with blood. When the tick begins to feed, the *B. burgdorferi* in the tick's midgut change morphologically and migrate to the tick's salivary glands. The tick must be attached for 24-36 hours before transmission of *B. burgdorferi* occurs.



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Disease and Treatment

Signs and symptoms of early localized Lyme disease begin 3 to 30 days after an infectious tick bite. About 75% of cases have erythema migrans (EM), an expanding rash that often, but not always, has a “bull’s-eye” appearance. Other manifestations include fatigue, fever, headache, muscle and joint aches, and swollen lymph nodes. Small, non-expanding rashes appearing within hours of tick bites are likely reactions to tick saliva and not EM lesions.



Examples of erythema migrans; more at http://www.cdc.gov/lyme/signs_symptoms/

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If localized infection is not treated, *B. burgdorferi* may disseminate and cause multiple EM lesions, intermittent swelling of large joints, Bell’s palsy, meningitis, heart block, or other complications (http://www.cdc.gov/lyme/signs_symptoms/index.html).

Patient history is an important aspect of Lyme disease diagnosis. Many tick bites are undetected, so absence of a known bite does not preclude diagnosis. Suggestive exposures include: residence near wooded, brushy, or grassy land; recent outdoor activity; travel to highly endemic areas; or contact with outdoor pets.

Serologic testing is the most common diagnostic assay for Lyme disease. Testing recommendations and interpretations vary by clinical presentation and illness duration:

Erythema migrans (EM) rash: Antibodies to *B. burgdorferi* may be undetectable for 3-4 weeks after onset, so base the diagnosis and treatment on EM and exposure history, not serologic results. For confirmation and disease surveillance, test convalescent serum for patients exposed in Washington or other low-incidence area.

Illness < 30 days in duration (without EM): Test EIA/IFA with reflex to Western blot IgM and IgG.

Illness > 30 days in duration: Base diagnosis and treatment on presence of Western blot IgG antibodies, which usually arise after one month. If IgG is negative, a positive IgM is likely a false-positive.

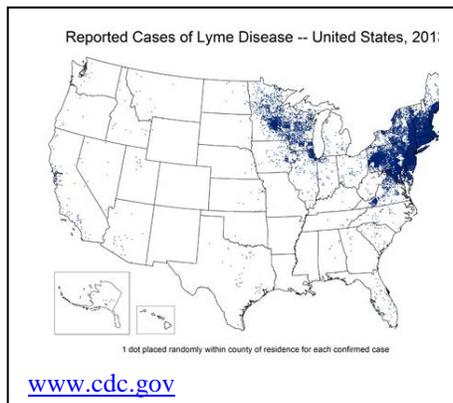
Arthritis or central nervous system disease: PCR may be useful for synovial fluid or CSF specimens.

Doxycycline is often used to treat adults with early localized Lyme disease. Other antibiotics (e.g., amoxicillin, cefuroxime axetil) may be indicated by patient characteristics or disease stage. For treatment details see: <http://cid.oxfordjournals.org/content/43/9/1089.full>.

Current evidence does not indicate that viable *B. burgdorferi* persist after appropriate antibiotic treatment for Lyme disease. “Post-Lyme disease syndrome” can occur in some patients treated for late manifestations but is likely due to an inflammatory response or unrelated process. Long-term or repeated antibiotic treatment for “chronic Lyme disease” is not supported by science-based evidence and can lead to adverse events or missed opportunities for alternate diagnoses.

Epidemiology

In 2014, 15 confirmed and probable Lyme disease cases (0.2 cases/100,000 population) were reported in Washington. Most of Washington’s cases were exposed in endemic areas, such as



high-incidence states in the Midwest and Northeast, where incidence reached 26 to 108 cases/100,000 population in 2013. Typically, one to three cases each year – although none in 2014 – were exposed within Washington, mostly in western counties. *I. pacificus* are encountered throughout western Washington and along the eastern slopes of the Cascades, with *B. burgdorferi* identified in low numbers of *I. pacificus* in Clallam, Klickitat, and Mason counties, as well as other *Ixodes* species in some other counties. While surveillance confirms the presence of *B. burgdorferi* in Washington, it has been detected in less than 2% of the overall *I. pacificus* tested from the state.

Highest risk for *I. pacificus* bites in Washington is during the spring, early summer, and fall months. Other tick-borne diseases of concern in Washington include anaplasmosis, babesiosis, Rocky Mountain spotted fever, tularemia, tick-borne relapsing fever, and tick paralysis.

Precautions to prevent tick bites and disease transmission when in risk areas include:

- Apply EPA-registered tick repellents such as DEET or permethrin
- Wear long pants and light colors (to route ticks away from the skin and to help spot them easier against clothing)
- Inspect yourself and young children for ticks during and after outdoor activities
- For more information, see http://www.cdc.gov/lyme/prev/on_people.html

Public Health Roles

Despite the low incidence in Washington, Lyme disease remains a concern. Locally-acquired cases and known populations of infected ticks indicate some local risk. Health care provider unfamiliarity with Lyme disease could delay treatment for patients infected locally or through travel. In addition, *Ixodes* ticks have spread to new areas in other states, and Lyme disease has increased in incidence and expanded in distribution nationally. Future effects of climate change could influence the distribution and abundance of *B. burgdorferi*-infected *I. pacificus* in Washington.

Due to these concerns, it is important to continue timely follow-up of reported Lyme disease cases, including conducting detailed case interviews to determine areas of likely tick exposure and encouraging the submission of clinical specimens from locally-exposed cases to the Washington State Public Health Laboratories. Counseling the public about Lyme disease prevention is also crucial.

Local public health agencies also play a key role in helping ensure that health care providers and the public seek science-based materials about Lyme disease. Together with providers, Washington's local health jurisdictions can help those living and enjoying recreation in Washington State to protect themselves from tick-borne infections.

Resources

U.S. Centers for Disease Control and Prevention

- Lyme disease home page: <http://www.cdc.gov/lyme/index.html>
- Tickborne Diseases of the United States: A Reference Manual for Health Care Providers: <http://www.cdc.gov/lyme/resources/TickborneDiseases.pdf>
(iOS App: <http://www.cdc.gov/mobile/applications/mobileframework/tickborne-diseases.html>)

Infectious Diseases Society of America

- Clinical practice guidelines for Lyme disease, anaplasmosis, and babesiosis: <http://www.idsociety.org/lyme/>

Washington State Department of Health

- Tick webpage: <http://www.doh.wa.gov/CommunityandEnvironment/Pests/Ticks>
- Lyme disease guidelines: <http://www.doh.wa.gov/Portals/1/Documents/5100/420-061-Guideline-Lyme.pdf>
- For information about sending in ticks for testing: <http://www.doh.wa.gov/CommunityandEnvironment/Pests/Ticks>

University of Rhode Island TickEncounter Resource Center

- http://www.tickencounter.org/tick_identification/westernblacklegged_tick

