

Lyme Disease

Written by Magdalena Ostas
from research compiled by Carol Martin, RDH

Lyme disease was first documented in 1975 following a mysterious outbreak of arthritis preceded by rash in Lyme, Connecticut. Since then more than 100,000 cases have been reported to the Centers for Disease Control and Prevention (CDC), with incidences rising every year.

Lyme disease is an infection caused by the spirochete *Borrelia burgdorferi*, a bacterium transmitted from a vector tick to the bloodstream and tissue cells of a host via a bite to the skin. Infection can involve myriad symptoms. The dental hygienist can play a significant role in the early diagnosis of this potentially debilitating disease and should be aware of its signs when updating a patient's health history.

Where

Although cases have been reported in almost every U.S. state, most instances of Lyme disease come from three distinct high-risk areas: the West Coast (especially the humid northwest coastal region), the northeastern United States (Connecticut, Rhode Island, New York, and New Jersey top the list nationwide), and parts of the upper Midwest (Minnesota, Wisconsin). State and county health departments can offer guidelines for risk in specific areas, especially rural and suburban ones.

Ticks tend to dwell in leaf litter and tall grass; and in moist, wooded, overgrown areas that are especially frequented by deer and rodents. However, they can be found in any kind of vegetation, including well-kept gardens. They cannot jump or fly, do not drop down from above, and can latch onto a host who only brushes up against it. The concentration of ticks is greatest during the spring and early summer.

Geographical location is the most significant risk factor for contacting the disease. People who work, live, or play in endemic areas are at the greatest risk. Several studies have documented that the risk elevation for outdoor workers is at least four- to six-fold.

Symptoms

There are many stages of clinical presentation for Lyme disease. The characteristics can be subtle and easily

overlooked. It is characterized by a rash termed *erythema migrans*, sometimes also called a "bull's eye" rash. It begins one to two weeks after infection as a small red papule at the site of the bite and expands over time with concentric rings of redness at least 5 cm, and up to 20 cm, in diameter. The rash lasts an average of three to five weeks. The lesion is often warm to the touch but is not sensitive, sore, or itchy. Half of all patients develop multiple secondary lesions in addition, which come and go and which are not associated with the original site. Flu-like symptoms manifest in approximately half of all cases as well, with intermittent and fluctuating forms of fatigue, fever, chills, and aches.

Lyme disease is characterized by neurological and cardiac symptoms in various combinations, most commonly meningitis and atroventricular block. Lyme disease frequently involves arthritis—attacks of asymmetric joint swelling and pain in the monoarticular or large joints—but can involve subtle cognitive dysfunctions as well. It is thought, though it has not been documented conclusively, that Lyme disease acquired during pregnancy can lead to serious birth defects or to stillbirth.

Diagnosis

Lyme disease is diagnosed taking the following variables into consideration: 1) tick exposure in endemic region, 2) temporality and evolution pattern of symptoms, and 3) laboratory testing. Diagnosis of early Lyme disease is made clinically and may be reinforced by the history of a tick bite and presenting symptoms. Laboratory testing may be equivocal. Many of the available tests detect antibodies to the *B. burgdorferi* bacteria or the presence of *B. burgdorferi* DNA. These tests do not directly detect the presence of the bacteria; therefore, none gives definite results. CDC recommends using serologic testing (ELISA) and Western Blot assay. Other tests are generally used only to substantiate positive or unclear initial test results and include skin biopsy, polymerase chain reaction (PCR) testing, and a Lyme DOT BLOT Assay (LBA) urine test.

B. burgdorferi is difficult to isolate in the blood; and in late Lyme disease progression, it has already settled deep into the tissue. It is difficult to diagnose Lyme disease definitively, and to be certain an affected patient has thoroughly overcome infection. Furthermore, the exact nature of chronic Lyme disease is a point of great contention in the medical community: Some believe there is an urgent need for better-

Web Sites

- American Lyme Disease Foundation (www.aldf.com)
- Lyme Alliance (www.lymealliance.org)
- Lyme Disease Foundation (www.lyme.org)
- Lyme Disease Resource Center (www.lymedisease.org)
- Lyme Disease Research Studies (www.columbia-lyme.org)
- International Lyme and Related Diseases Society (www.ilads.org)

Tick Control

How to protect yourself from tick bites when working or playing outdoors:

- Avoid tick-infested areas, especially in May, June, and July.
- Inspect yourself and others thoroughly after a day in a tick-infested habitat. Be especially mindful of the scalp and hairline. **The best line of defense against Lyme disease is to examine yourself daily and remove all ticks before they have a chance to take grip.**
- Wear light-colored clothing so that ticks are easily visible.
- Wear long-sleeved shirts and pants, tucking pant ends into socks and shirt into pants. Tape can be used to secure the tucked-in borders in especially high-risk conditions.
- Use repellent with the active ingredient DEET, following directions carefully.
- Avoid trail margins, walk in the center of all trails, and always choose well-traveled ones.
- Keep long hair tied back.
- Remember to check pets for ticks too.

For those who reside in high-risk areas:

- Remove wood piles, rock walls, and bird feeders from your property, as they attract tick-carrying small animals.
- Remove leaves and clear brush and tall grass around house.
- There is a relationship between abundance of deer and abundance of deer ticks in the eastern United States. Remove plants that attract deer and consider placing physical barriers as well.
- Judicious use of insecticides might be necessary in some regions. Questions about the environmental safety and effectiveness of insecticides remain, however. Application should always be supervised by a licensed professional.

Removal

If you find a tick on your body or clothes, don't panic. Not all ticks are infected, and those that are need at least 36–48 hours to transmit Lyme disease-causing bacteria to a host. Removing ticks from the body in time is the most crucial measure one can take to guard against the disease. Learn how to identify the disease-carrying ticks in your area: An immature tick is usually about the size of a poppy seed, and a mature tick about one-quarter inch in length. The sooner a tick is removed, the less likely an infection will result.

How to remove a tick:

- Using fine-point tweezers (not your fingers!), grasp the tick as close as possible to the skin and pull out—carefully and steadily.
- Treat the area with antiseptic.
- Don't irritate the tick with chemicals and don't grasp or crush the body, as the aggravation may cause the tick to inject more germs into the skin.
- Place the tick in a vial or jar marked with the date and patient's name.
- Call your doctor to determine whether treatment is warranted.
- Continue to monitor the site carefully for the beginnings of a rash.

controlled long-term research to address the growing rate of incidence, while others complain that the disease is greatly overdiagnosed and overtreated. The symptoms of Lyme disease may closely resemble those of numerous other systemic ailments such as chronic fatigue syndrome, fibromyalgia, Parkinson's disease, amyotrophic lateral sclerosis, dementia, Alzheimer's, lupus, multiple sclerosis, inflammatory or degenerative arthritis, influenza, Bell's palsy, and depression. Diagnosis in later stages often involves progressively ruling out these other illnesses.

Treatment

The longer the bacterial infection, the more aggressive and greater in duration the course of treatment must be. Treating Lyme disease caught right away is straightforward, and the majority of cases are easily cured. Almost all patients respond to first-line antibiotic treatment (doxycycline and amoxicillin, with cefuroxime and erythromycin as common alternatives).

Early detection of Lyme disease is crucial, for once the disease has progressed to its later stages, treating it becomes infinitely more complex and therapies much more involved. There is no standard regimen used to treat chronic Lyme disease, and various combinations of antibiotics, vitamins, anti-inflammatory agents, and exercise are usually prescribed. Many factors are taken into consideration when proposing a course of treatment: the patient's age and weight, health history, the duration of the illness, and any coinfections.

A controversial FDA-approved vaccine for Lyme disease is accessible (LYMERix™) for patients aged 15–70, but it is only recommended to those who live or work in high-risk areas; however, concerns about its safety have been raised by both patients and physicians.

Dental Hygienists

The best time for dental hygienists to detect symptoms of Lyme disease is during an oral cancer exam. Many signs can appear in or around the mouth. For example, data suggest that temporomandibular joint (TMJ) arthritis can be linked to chronic Lyme disease. Patients may complain of dental pain or of facial pain that simulates toothache in the absence of any detectable dental or orofacial pathology. Numbing or tingling in the face has been noted as well. Gary M. Heir, DMD, associate clinical professor in the Department of Oral Pathology, Biology, and Diagnostic Services at the University of Medicine and Dentistry of New Jersey, has published numerous articles on orofacial pain associated with Lyme disease, and notes that often the pain moves around, changing quadrants and moving from side to side. Some medications used to treat Lyme disease also cause oral and dental complications: staining, dry mouth, or a sour taste in the mouth. In the event that Lyme disease is suspected, prompt referral to a specialist is imperative.

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