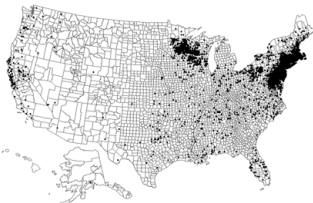


TREATMENT

- Lyme disease can be difficult to diagnose because a rash is not always present and the symptoms are usually flu-like in nature.
- Serological testing can be performed to provide supportive diagnostic information for Lyme disease but diagnosis is primarily based on clinical observations.
- Antibiotic therapy with doxycycline or amoxicillin for 3 to 4 weeks is generally effective in early cases.
- Cefuroxime axetil or erythromycin may be used for those who are allergic to penicillin or who cannot take tetracycline-derivative drugs.
- Animals with Lyme disease are also treated with antibiotics. In most cases, early antibiotic treatment has shown to increase the chance of recovery and lessen the severity of symptoms for both humans and animals.
- In later stages of the disease, particularly with neurological complications, treatment with intravenous ceftriaxone or penicillin for 4 weeks or more may be required. Treatment failures or relapses may occur and re-treatment may be necessary in later stages of Lyme disease.
- It is possible to become re-infected with Lyme disease after subsequent tick bites; infection with Lyme disease does not provide immunity.
- Lyme disease is rarely, if ever, fatal.

Reported Cases of Lyme Disease, United States, 1998*



*1 dot = 1 case, randomly placed within county of residence; 16,901 cases

CDC

RESOURCES

The Centers for Disease Control and Prevention

1600 Clifton Rd.
Atlanta, GA 30333
800.311.3435 (Public Inquiries)
404.639.3311 (Telephone)

<http://www.cdc.gov/ncidod/dvbid/lyme/index.htm>

National Park Service - Ticks and Lyme Disease

Brochure by Howard S. Ginsberg, Jorge Benach and Edward M. Bossler (revised by Lloyd E. Miller, DVM, Troy, NY, March 1993).

United States Environmental Protection Agency

US EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Ave., N.W.
Washington, DC 20460
New England Region: 888.372.7341 (Telephone)

<http://www.epa.gov/opp00001/citizens/deet.htm>

Lyme Disease Foundation, Inc.

1 Financial Plaza, 18th Floor
Hartford, CT 06103
860.525.2000 (Telephone)
800.886.5963 (Toll Free Hotline)
860.525.8425 (Facsimile)

<http://www.lyme.org/>

University of New Hampshire Office of Environmental, Health and Safety

Perpetuity Hall, 11 Leavitt Lane
Durham, NH 03824
603.862.4041 (Telephone)
603.862.0047 (Facsimile)

<http://www.unh.edu/ehs>



UNIVERSITY of NEW HAMPSHIRE

Created by David R. Gillum and Amy B. Vento
Office of Environmental Health and Safety

Lyme Disease: Safety Pamphlet

The University of New Hampshire's Office of Environmental Health and Safety has produced this pamphlet due to the increased numbers of Lyme disease in the northeastern United States. This document is a guide and should not replace the expertise of your health care provider.

BACKGROUND

- In the early 20th century physicians in Europe observed patients with a red, slowly spreading rash called erythema migrans (EM) resulting from tick bites, and thought the source was a tick-borne bacterium.
- In the 1940s similar tick-borne illnesses were discovered that began with EM and developed into broad types of illnesses. Spirochete-like structures were found in skin samples and were treated with penicillin.
- Lyme disease was given its name in 1977 in Lyme, Connecticut where a number of children were developing arthritis.
- In 1982 spirochete bacteria were identified in the midgut of the adult deer tick *Ixodes dammini*, originally known as the black-legged tick, *Ixodes scapularis* and were given the name *Borrelia burgdorferi*.
- In 1984 it was confirmed that the bacterium *Borrelia burgdorferi* caused Lyme disease.
- The CDC reports more than 16,000 cases of Lyme disease in the United States each year.

TRANSMISSION

- Immature ticks become infected with the Lyme disease-causing bacteria *B. burgdorferi* from biting rodents, such as the white-footed mouse, and other mammals, such as deer, that carry the bacteria.
- Infected ticks can transmit the bacteria to humans and other animals during the feeding process by inserting their mouths into the skin of their host and slowly taking in blood.
- Many different species of ticks of the *Ixodes* genus transmit Lyme disease in different regions of the United States.
- *Ixodes* ticks are much smaller than common dog and cattle ticks, being no larger than a pinhead in their larval and nymphal developmental stages.
- It is more likely for *Ixodes* ticks to transmit infection after feeding for two or more days.
- Ticks in the nymphal stage are mainly responsible for transmitting Lyme disease to humans, because they are extremely small and are usually overlooked. Nymphal ticks are most active during the months of May through August.
- Ticks in the larval stage rarely carry the *B. burgdorferi* bacteria at the time of feeding and therefore do not usually transmit Lyme disease.
- Although adult ticks carry the bacteria and can transmit the disease, they are usually more easily spotted and removed before they have sufficient time to transmit the infection.
- There is no evidence suggesting Lyme disease is transmitted by other insects. Lyme disease is not transmitted by direct human-to-human contact, or human-to-animal contact.



PREVENTION

- Whenever possible, avoid tick-infested areas such as moist, shaded environments with low-lying vegetation in wooded, brushy, or grassy habitats.
- If entering a tick-infested area, wear light colored clothing so ticks can be easily spotted. Wear long-sleeved shirts and keep pant legs tucked into socks or boot tops.
- Insect repellent containing DEET (n,n-diethyl-m-toluamide) should be applied to clothing and exposed skin. Permethrin, also found in some insect repellents, kills ticks on contact and should also be applied to clothing. Insect repellents should only be used according to manufacturer's directions.
- Always perform a tick check and remove attached ticks from skin. Embedded ticks should only be removed using fine tweezers. Never attempt to remove ticks with fingernails, petroleum, fire, nail polish, or other products.
- Firmly grasp the tick with the head of the tweezers as close to the skin as possible, and pull the tick's body away with a steady motion. After removal, cleanse the area with an antiseptic. Ticks should be saved and brought to your health care provider for analysis.
- Those who reside, work, or recreate in high-risk areas, whose exposure is frequent or prolonged may be considered for vaccination. Please refer to your health care provider for information on Lyme disease vaccination.
- Pets can and should be vaccinated against Lyme disease. Please refer to your veterinarian for information regarding the Lyme disease vaccine.



SYMPTOMS

- Within days to weeks, or even a month following a tick bite, about 80% of patients developing Lyme disease will have a red, slowly expanding rash, usually with a characteristic "bull's-eye," called erythema migrans (EM). The rash may also be blotchy red or red throughout. It can be similar in appearance to poison ivy, spider and other insect bites, and ringworm.
- The rash may be accompanied by fatigue, fever, headache, malaise, stiff neck, sore throat, muscle aches (myalgia), joint pain (arthralgia), and other flu-like symptoms.
- Some patients may develop the flu-like symptoms without the rash. Others may have no symptoms at all.
- If left untreated, some Lyme disease patients may develop musculoskeletal system manifestations, such as muscle pain and/or arthritis, including intermittent episodes of joint swelling and pain.
- Neurological abnormalities, such as aseptic meningitis, Bell's palsy, motor and sensory nerve inflammation (radiculoneuritis), and inflammation of the brain (encephalitis), may occur in untreated cases.
- In rare cases, cardiac problems, such as atrioventricular blockage, acute inflammation of the tissue surrounding the heart (myopericarditis), or enlarged heart (cardiomegaly), may occur.
- If you or your pet develops any of the signs and symptoms of Lyme disease, or if you or your pet has been bitten by a deer tick, you should contact your health care provider or veterinarian as soon as possible for early or preventative treatment.

