

# Microbe of the Month

## Lyme Disease

### Borrelia burgdorferi

#### Transmission

Lyme disease is caused by the spirochete bacterium *Borrelia burgdorferi*. Spirochetes have an unusual twisting motility due to endoflagella (also called axial filaments) that wrap around the spiral cell between the inner and outer membrane. The bacterium is transmitted to humans through the bite of infected blacklegged tick, *Ixodes scapularis*. The bacterium passes between *Ixodes* ticks and a vertebrate host. Lyme disease is the most common vector-borne illness in the USA.

*Getting ticked off? An SUU college student is thrilled to be hiking the Appalachian trail during his summer vacation. A week after his backpacking adventure began, he experienced fever, chills, headache, fatigue, and joint aches. Another week passed. After episodes of dizziness and shortness of breath, he returned home. A month later his right knee appeared swollen and painful. Unaware that he had been bitten by a tick, and lacking the bulls-eye rash, diagnosis was difficult.*

#### Treatment/ Prevention:

Lyme disease was first identified in Lyme, Connecticut. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. It is more prevalent in May through November when people are outdoors during the nymph phase of the tick vector. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, applying pesticides, and reducing tick habitat.

#### Signs/ Symptoms:



Lyme disease is a multisystem illness caused by infection with the spirochete *Borrelia burgdorferi* and the body's immune response. Typical symptoms include fever, headache, fatigue, and a skin rash (often bulls-eye shaped) at the site of the bite. Disseminated (in blood) Lyme disease may develop 3-10 weeks after inoculation. If left untreated, infection can spread to joints, the heart, and the nervous system. In a small percentage of cases, these symptoms can last for more than 6 months, a condition called "Post-treatment Lyme Disease Syndrome" (PTLDS). In patients with late disease, the typical physical finding is arthritis, especially the knee.

Not all ticks transmit Lyme disease. In the United States, most infections occur in endemic areas of the Northeast and mid-Atlantic states, Wisconsin, Minnesota and northern California. *Ixodes* ticks must feed on the blood of an infected vertebrate to acquire the bacterium. An infected nymphal tick then transmits *B. burgdorferi* in its saliva to a human during its blood meal. Although blacklegged ticks exist in the southern U.S., their feeding habits make them much less likely to transmit Lyme disease.

For further questions or concerns, please see your physician.

Reference: [www.cdc.gov](http://www.cdc.gov)

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