

10. WHAT IS LYME DISEASE?

BY DEFINITION, LYME DISEASE REFERS TO THE INFECTIOUS ILLNESS caused by the bacteria *Borrelia burgdorferi*, along with other strains of *Borrelia* such as *afzelii*, *andersonii* and *garinii*. *Borrelia* is a spiral-shaped bacterium, known as a spirochete (“spi-ruh-keet”), which crosses over into the blood stream of a human during the bite of an infected tick.

Having said that, the narrow definition of Lyme disease given above, as a strictly bacterial infection caused by *Borrelia*, may not appropriately reflect the diversity and complexity of the illness. It is more clinically useful to expand the definition to include related co-infections that are transmitted along with *Borrelia*, such as *Babesia*, *Bartonella*, *Rickettsia* and *Ehrlichia*. “Tick-borne disease” is another term that may be more inclusive, however, even that limits the recognition of transmission to one vector (the tick), which may not be 100% accurate either.

There are different phases of infection in Lyme disease. Lyme disease is classified according to the longevity of infection, where it has spread in the body and how systemic it has become as well as the types of signs and symptoms it is causing. The earlier the infection can be identified, the greater the success in treatment, which is why awareness of the early forms of Lyme is crucial, including clinical presentations that are not “textbook”. It is also important to note that the following phases may not necessarily occur along a linear timeline; some people experience symptoms of advanced, chronic Lyme disease shortly following their infection.

Early localized Lyme

The classic sign of early local infection with Lyme disease is a circular, outwardly expanding rash called erythema migrans (or EM rash), which may occur at the site of the tick bite three to thirty days after the bite. I say “may” because, in reality, the EM rash is absent in over 50% of Lyme disease cases.¹

The textbook presentation of the EM rash would be a target shape – a red outer ring with a central clearing – appearing as a bull’s eye, hence its nickname “bull’s eye rash”. Many patients have no recollection of such a rash, or if they think back to a rash they might have had, they may have not recognized it as an EM rash. This is one of the reasons that an acute Lyme infection may not be diagnosed accurately.

The “textbook” presentation of EM rash must also be put in context. One study shows that the tell-tale central clearing was absent in over half of a series of EM rashes examined.³ Rashes can cover large parts of the body, and they may be patchy or diffuse. They can also mimic other common presentations including a spider bite, ringworm, or cellulitis. In one study, a series of eleven EM rashes were misdiagnosed and treated as cellulitis, with all eleven patients showing clinical evidence of Lyme disease progression.⁴

Along with a rash, early localized Lyme may present with flu-like illness, fevers, malaise, muscle soreness and headache. Lyme disease can progress to later stages even in patients who do not develop a rash. Therefore, Lyme disease should be considered when a flu-like illness is combined with possible exposure through activities such as camping, bushwalking or gardening.

Early disseminated Lyme

In early disseminated Lyme, the bacteria spread through the bloodstream and affect other parts of the body. Muscle, joint and tendon pain may appear, often migrating to different parts of the body. Dizziness and

headaches, heart palpitations, severe fatigue and mood changes are common.

Neurological symptoms can also start to appear. These include Bell's palsy, which is the loss of muscle tone on one or both sides of the face, as well as meningitis, which involves severe headaches, stiff neck and sensitivity to light. Many people experience burning or shooting pains and unusual skin sensations such as crawling, tingling or burning. Cognitive changes are also common – brain fog, memory loss and difficulty with focus and concentration. Psychological symptoms include severe anxiety, irritability and even the development of obsessive-compulsive traits.

Chronic Lyme disease

Chronic Lyme disease is trickier to define in light of the Infectious Diseases Society of America's (IDSA) denial of its very existence (see Section 1), but this is the phase of Lyme disease that thousands of people suffer from on an ongoing basis.

Joseph Burrascano, MD, a physician at the forefront of Lyme disease treatment and research in the United States, and author of *Advanced Topics in Lyme Disease: Diagnostic Hints and Treatment Guidelines for Lyme and Other Tick-borne Illness*⁵ (a set of treatment guidelines that is widely referenced in the United States, and which is included in an Appendix in this book) offered the following definition:

For a diagnosis of chronic Lyme disease, these three criteria must be present:

1. Illness present for at least one year (this is approximately when immune breakdown attains clinically significant levels).
2. Persistent major neurologic involvement (such as encephalitis/encephalopathy, meningitis, etc.) or active arthritic manifestations (active synovitis).
3. Active infection with *B. burgdorferi* (Bb), regardless of prior antibiotic therapy (if any).

LYME DISEASE in Australia

ILADS, the USA organization that recognizes chronic Lyme disease, has adopted a set of treatment guidelines, which have been widely used in clinical practice (available at www.ilads.org). They state the following: “*Chronic Lyme disease* is inclusive of persistent symptomatology including fatigue; cognitive dysfunction; headaches; sleep disturbance; and other neurologic features such as demyelinating disease, peripheral neuropathy and sometimes motor neurone disease; neuropsychiatric presentations; cardiac presentations including electrical conduction delays and dilated cardiomyopathy; and musculoskeletal problems”.

The guidelines also introduce definitions for *persistent* Lyme disease—symptoms continuing despite 30 days of treatment; *recurrent* Lyme disease—the patient relapsing in the absence of another tick bite or EM rash; and *refractory* Lyme disease—a patient responding poorly to antibiotic therapy.

REFERENCES

1. Stricker RB, Lautin A. The Lyme wars: time to listen. *Expert Opin Investig Drugs*. 2003;12:1609–14.
2. Lyme Disease Wikipedia [Internet]. San Francisco: Wikimedia Foundation. Last modified 2012 Aug 2 [cited 2012 Jul]. Available from: http://en.wikipedia.org/wiki/Lyme_disease
3. Nadelman RB, Wormser GP. Erythema migrans and early Lyme disease. *Am. J. Med*. 1995;98(4A):S15–S24.
4. Nowakowski J, McKenna D, Nadelman RB, et al. Failure of treatment with cephalexin for Lyme disease. *Arch Fam Med*. 2000;9:563–7.
5. Burrascano J. Advanced topics in Lyme disease: diagnostic hints and treatment guidelines for Lyme and other tick-borne illness. 15th. rev. ed. 2005 Sep; Available from: http://www.ilads.org/files/burrascano_0905.pdf