

Diagnosis and treatment of Lyme disease

A physician should be consulted if Lyme disease is suspected. Only the rash is distinctive enough for a clinical diagnosis without laboratory confirmation. In the absence of an EM rash, Lyme disease may be difficult to diagnose because its symptoms and signs vary among individuals and can be similar to those of many other diseases. Conversely, other arthritic or neurologic diseases may be misdiagnosed as Lyme disease. Lyme disease is probably both over-diagnosed and under-diagnosed with groups of patients, some of whom without Lyme disease convinced they have it while other patients with the disease being told they do not have it. A blood test to detect antibodies to Lyme disease spirochetes (serological testing) can support or confirm the clinical diagnosis of the disease. Antibodies to *Borrelia* antigens (parts of the bacteria recognized by the immune system) usually cannot be detected until 3-4 weeks after onset of disease. Therefore, tests are not reliable enough to be used as the sole criterion for a diagnosis during the early stages of the disease. Tests can give false-negative and false-positive results. Newer tests are more specific, greatly reducing false positive reactions. Reliability of the test improves dramatically in the later stages of the disease as serological reactivity increases, although inaccurate results may still occur. Patients with neurologic or arthritic Lyme disease almost always have elevated antibody concentrations.

Lyme disease can be treated with one of several types of antibiotics, including tetracyclines, most penicillins, and many second- and third-generation cephalosporins (e.g., doxycycline, amoxicillin, cefuroxime axetil, penicillin, ceftriaxone, or cefotaxime). Doxycycline is also effective against the agent of human granulocytic anaplasmosis. The standard course of treatment generally is for 14-28 days, depending upon clinical manifestation and drug, though a physician may elect a longer course of treatment. Tetracyclines should be avoided for pregnant or lactating women and children >8 years of age. Patients treated in the early stages of the disease usually recover rapidly and completely with no subsequent complications. While a few patients (<10%) fail to respond to antibiotic therapy, retreatment is rarely needed. Oral antibiotics are effective in treating most cases of Lyme disease.

Intravenous antibiotics are indicated for central nervous system involvement and for recurrent arthritis. Full recovery is likely for patients treated in the later stages of the disease. Development of other Lyme disease symptoms after a course of antibiotics may require re-treatment with the appropriate antibiotic. However, resolution of some symptoms may take weeks or months even after treatment due to the inflammatory processes and damage associated with *B. burgdorferi* infection, which does not appear to be altered by an initial longer course of antibiotics. Post-Lyme syndrome is not well defined and most researchers feel there is insufficient convincing evidence for persistent infection by *B. burgdorferi*.