

Lyme Disease Clinical Information, Laboratory Diagnosis, and Reporting for Health Care Providers

Incubation Period: 3-30 days

Signs and Symptoms

Untreated Lyme disease can produce a wide range of symptoms, depending on the stage of infection.

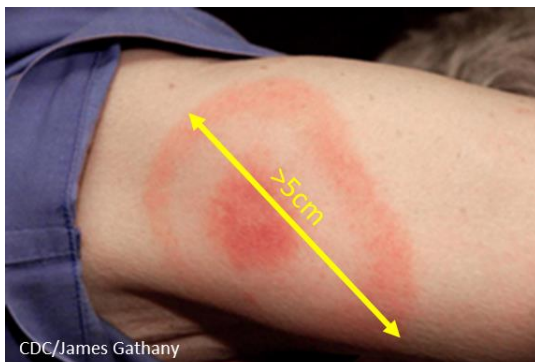
Localized Stage

During the localized (early) stage of illness, Lyme disease may be diagnosed clinically in patients who present with an EM rash. Serologic tests may be insensitive during this stage.

- **Erythema migrans (EM):** EM is a skin lesion that typically begins as a red macule or papule and expands over a period of days to weeks to form a large round lesion, often with partial central clearing (like a bulls-eye). Secondary lesions also may occur, but the single primary lesion typically reaches more than 5 cm across in size.

The expansion of the EM rash helps to differentiate it from an allergic reaction at the site of the bite. Unlike EM, allergic reactions do not expand and disappear within a few days. Annular erythematous lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM.

EM occurs in approximately 70% to 80% of infected persons and starts at the site of a tick bite after 3 to 30 days (average is about 7 days). The diagnosis of EM must be made by a physician.



- **Flu-like symptoms:** malaise, headache, fever, myalgia, arthralgia
- **Lymphadenopathy**

Disseminated Stage

During disseminated disease serologic tests are usually positive.

- **Multiple secondary annular rashes**

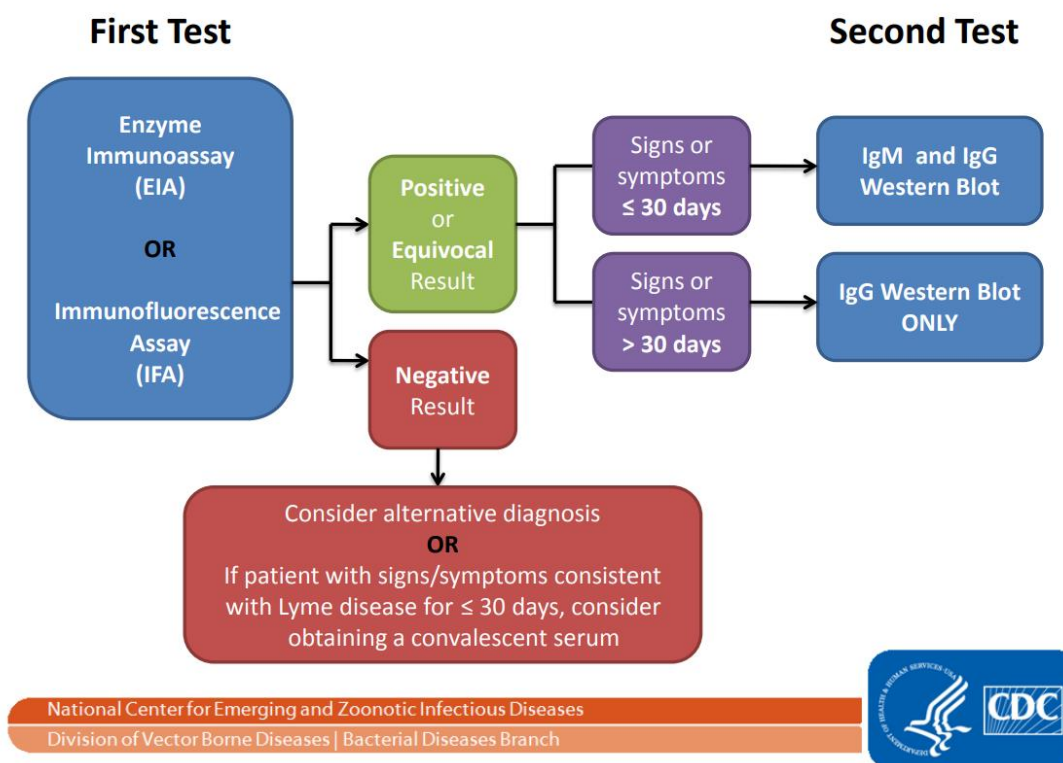


- **Flu-like symptoms:** malaise, headache, fever, myalgia, arthralgia
- **Lymphadenopathy**
- **Musculoskeletal signs:** Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints, sometimes followed by chronic arthritis in one or a few joints.
- **Neurologic signs:** Any of the following signs that cannot be explained by any other etiology, alone or in combination: lymphocytic meningitis; cranial neuritis, particularly facial palsy (may be bilateral); radiculoneuropathy; or, rarely, encephalomyelitis.
- **Cardiovascular signs:** Acute onset of high-grade (2nd-degree or 3rd-degree) atrioventricular conduction defects that resolve in days to weeks and are sometimes associated with myocarditis and/or pericarditis.
- **Additional manifestations:** conjunctivitis, keratitis, uveitis, mild hepatitis, splenomegaly

Laboratory Diagnosis

The “gold standard” for Lyme disease diagnosis is a two-tier testing protocol. Enzyme immunoassay (EIA) or immunofluorescence assay (IFA) is first performed, and if positive or equivocal, it is followed by a Western blot. EIA and IFA tests alone, without a secondary Western Blot, have low specificity, may yield false-positive results, and should not be used alone for diagnosis. The low specificity is due to their potential to cross-react with antibodies to commensal or pathogenic spirochetes (e.g. syphilis, leptospirosis), some viral infections (e.g., varicella, Epstein Barr virus), or certain autoimmune diseases (e.g., lupus). At any stage of illness, a positive IgM test alone is not sufficient to diagnose current disease because this does not distinguish between an active or past infection. Furthermore, persons with illness >1 month should only have IgG testing (not IgM). Finally, **serologic tests cannot be used to measure treatment response**.

Two-Tiered Testing for Lyme Disease



Laboratory tests that are not recommended

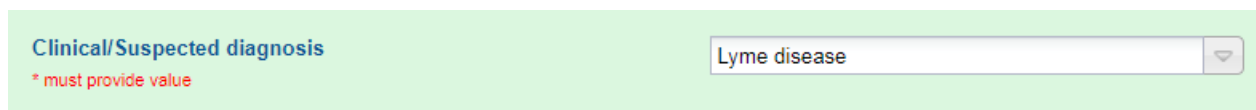
Some laboratories offer Lyme disease testing using assays whose accuracy and clinical usefulness have not been adequately established. Examples of unvalidated tests include:

- Capture assays for antigens in urine
- Culture, immunofluorescence staining, or cell sorting of cell wall-deficient or cystic forms of *B. burgdorferi*
- Lymphocyte transformation tests
- Quantitative CD57 lymphocyte assays
- “Reverse Western blots”
- In-house criteria for interpretation of immunoblots
- Measurements of antibodies in joint fluid (synovial fluid)
- IgM or IgG tests without a previous ELISA/EIA/IFA

Reporting Lyme Disease Cases

It is mandated that all cases of Lyme disease be reported within 48 hours after suspected diagnosis or appearance of suspicious symptoms to DC Health. Report cases of Lyme disease using the following steps:

1. Click on ***“Submit a Notifiable Disease and Condition Case Report Form using DCRC”*** on the DC Health Lyme Disease Webpage
2. Once you enter the online reporting system, select your facility and enter the submitters contact information
3. In the dropdown list for clinical/suspected diagnosis select ***“Lyme disease”***



The screenshot shows a light green rectangular box representing a form section. On the left, the text 'Clinical/Suspected diagnosis' is displayed in blue, with a red asterisk and the text '* must provide value' below it. To the right is a white dropdown menu with a thin grey border. The menu is open, showing 'Lyme disease' as the selected option. A small downward-pointing arrow icon is visible on the right side of the dropdown menu.

4. As you complete the remainder of the report please include as much clinical information you have available including:
 - a. Approximate diameter of any observed Erythema migrans;
 - b. Date of symptom onset;
 - c. Date of specimen collection (if a sample was submitted for Lyme disease testing);
 - d. Any known outdoor activities in wooded/brushy areas with high grass and/or leaf litter three months prior to symptom onset; and
 - e. If the patient notes they had a tick bite three months prior to symptom onset.