Lyme Disease (*Borrelia burgdorferi*) 2017 Case Definition

CSTE Position Statement(s)

- 16-ID-10

Clinical Description

A systemic, tick-borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The most common clinical marker for the disease is erythema migrans (EM), the initial skin lesion that occurs in 60%-80% of patients.

For purposes of surveillance, EM is defined as 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. A single primary lesion must reach greater than or equal to 5 cm in size across its largest diameter. Secondary lesions also may occur. Annular erythematous lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM. For most patients, the expanding EM lesion is accompanied by other acute symptoms, particularly fatigue, fever, headache, mildly stiff neck, arthralgia, or myalgia. These symptoms are typically intermittent. The diagnosis of EM must be made by a physician. Laboratory confirmation is recommended for persons with no known exposure.

For purposes of surveillance, late manifestations include any of the following when an alternate explanation is not found:

- *Musculoskeletal system* . 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. Manifestations not considered as criteria for diagnosis include chronic progressive arthritis not preceded by brief attacks and chronic symmetrical polyarthritis. Additionally, arthralgia, myalgia, or fibromyalgia syndromes alone are not criteria for musculoskeletal involvement.
- *Nervous system* . 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. Headache, fatigue, paresthesia, or mildly stiff neck alone, are not criteria for neurologic involvement.

- *Cardiovascular system* . 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. Palpitations, bradycardia, bundle branch block, or myocarditis alone are not criteria for cardiovascular involvement.

Laboratory Criteria for Diagnosis

For the purposes of surveillance, laboratory evidence includes:

- A positive culture for *B. burgdorferi*, **OR**
- A positive two-tier test. (This is defined as a positive or equivocal enzyme immunoassay (EIA) or immunofluorescent assay (IFA) followed by a positive Immunoglobulin M[1] (IgM) or Immunoglobulin G [2] (IgG) western immunoblot (WB) for Lyme disease) **OR**
- A positive single-tier IgG[2] WB test for Lyme disease[3].

[1] IgM WB is considered positive when at least two of the following three bands are present: 24 kilodalton (kDa) outer surface protein C (OspC)*, 39 kDa basic membrane protein A (BmpA), and 41 kDa (Fla). Disregard IgM results for specimens collected >30 days after symptom onset.

[2] IgG WB is considered positive when at least five of the following 10 bands are present: 18 kDa, 24 kDa (OspC)*, 28 kDa, 30 kDa, 39 kDa (BmpA), 41 kDa flagellin (Fla), 45 kDa, 58 kDa (not GroEL), 66 kDa, and 93 kDa.

[3] While a single IgG WB is adequate for surveillance purposes, a two-tier test is still recommended for patient diagnosis.

*Depending upon the assay, OspC could be indicated by a band of 21, 22, 23, 24 or 25 kDA.

Criteria to Distinguish a New Case from an Existing Case

Case not previously reported to public health authorities.

Exposure

Exposure is defined as having been (less than or equal to 30 days before onset of EM) in wooded, brushy, or grassy areas (i.e., potential tick habitats) of Lyme disease vectors. Since infected ticks are not uniformly distributed, a detailed travel history to verify whether exposure occurred in a high or

low incidence state is needed. An exposure in a high-incidence state is defined as exposure in a state with an average Lyme disease incidence of at least 10 confirmed cases/ 100,000 for the previous three reporting years. A low-incidence state is defined as a state with a disease incidence of <10 confirmed cases/100,000 (*see* https://www.cdc.gov/lyme/stats/tables.html). A history of tick bite is not required.

Case Classification

Suspected

- A case of EM where there is no known exposure (as defined above) and no laboratory evidence of infection (as defined above), **OR**
- A case with evidence of infection but no clinical information available (e.g., a laboratory report).

Probable

Any other case of physician-diagnosed Lyme disease that has laboratory evidence of infection (as defined above).

Confirmed

- A case of EM with exposure in a high incidence state (as defined above), **OR**
- A case of EM with laboratory evidence of infection and a known exposure in a low incidence state, **OR**
- Any case with at least one late manifestation that has laboratory evidence of infection.

Case Classification Comments

Lyme disease reports will not be considered cases if the medical provider specifically states this is not a case of Lyme disease, or the only symptom listed is "tick bite" or "insect bite."