Michigan Department of Health and Human Services

Guidance for Lyme Disease Case Report Classification

Receive a positive lab result

1 Verify that the patient had all labs necessary to meet CDC criteria[3].

- 2-tier + IgM Western Immunoblot (WB or IB) test collected within 30 days of onset **OR**
- 2-tier +IgG WB/IB test **OR**
- 1-tier +IgG WB/IB test **OR**
- + *B. burgdorferi* culture **OR**
- CSF antibody + for B. Burgdorferi by EIA or IFA (CSF titer must be higher than serum titer)

Yes, meets lab criteria

No, does not meet lab criteria

- Positive ELISA/EIA/IFA only OR
- IgM WB/IB only OR
- IgM WB/IB collected >30 days after onset

2 Speak to health care provider (HCP) to determine if patient had a diagnosed erythema migrans (EM)[1] with exposure* to a wooded, brushy, or grassy area ≤ 30 days before onset.
*Exposure can be in a high or low-incidence state.

EM not diagnosed and/or no exposure

EM diagnosed with exposure

Confirmed

3 Did HCP diagnose ≥1 late stage manifestation[4]?

Yes

Confirmed

Late Manifestations:
- Arthritis
- Bell's palsy or other cranial neuritis
- Encephalomyelitis
- Lymphocytic meningitis
- Radiculoneuropathy
- 2nd/3rd degree atrioventricular block

No

4 Did HCP diagnose ≥1 non-specific sign or symptom[5]?

No

Not a case

Yes

Probable

Symptoms Not Specific to Lyme Disease:
- Arthralgia
- Bundle branch block
- Cognitive impairment
- Encephalopathy
- Fatigue
- Fever/sweats/chills
- Headache
- Myalgias
- Myocarditis
- Neck pain
- Other rash
- Palpitations
- Paresthesias
- Visual/auditory impairments

2 Speak to healthcare provider (HCP) to determine if patient had a diagnosed erythema migrans (EM)[1]

Yes, EM diagnosed

No, EM not diagnosed

Not a case

3 Did patient have exposure to a wooded, brushy, or grassy area ≤30 days before onset in a HIGH-incidence state[2].

Exposure in HIGH-incidence state

Confirmed

No exposure in HIGH-incidence state

Suspected

Flowchart Revised March 2017
Adapted from the CSTE/CDC National Surveillance Case Definition (2011 Revision) available at www.cdc.gov

Michigan Department of Health and Human Services

Guidance for Lyme Disease Case Report Classification

Receive a Lyme disease case

1 Speak to healthcare provider (HCP) to determine if patient had a diagnosed erythema migrans (EM)[1].

- **Yes, EM diagnosed** → **2** Exposure in a high-incidence state[2] ≤ 30 days before onset?
  - **Exposure in HIGH-incidence state** → **Confirmed**
  - **No exposure in HIGH-incidence state** → **3** Did the patient have all labs necessary to meet CDC criteria[3].
    - **Yes** → **Confirmed**
      - 2-tier + IgM Western Immunoblot (WB or IB) test collected within 30 days of onset **OR**
      - 2-tier +IgG WB/IB test **OR**
      - 1-tier +IgG WB/IB test **OR**
      - + *B. burgdorferi* culture **OR**
      - CSF antibody + for B. Burgdorferi by EIA or IFA (CSF titer must be higher than serum titer)
    - **No** → **Suspected**
      - Positive ELISA/EIA/IFA only OR
      - IgM WB/IB only OR
      - IgM WB/IB collected >30 days after onset
- **No, EM not diagnosed** → **2** Did the patient have all labs necessary to meet CDC criteria[3]?
  - **Yes, meets lab criteria** → **3** Did HCP diagnose ≥1 late stage manifestation[4]?
    - **Yes** → **Confirmed**
      - Late Manifestations:
        - Arthritis
        - Bell's palsy or other cranial neuritis
        - Encephalomyelitis
        - Lymphocytic meningitis
        - Radiculoneuropathy
        - 2nd/3rd degree atrioventricular block
    - **No** → **4** Did HCP diagnose ≥1 non-specific sign or symptom[5]?
      - **Yes** → **Probable**
        - Symptoms Not Specific to Lyme Disease:
          - Arthralgia
          - Bundle branch block
          - Cognitive impairment
          - Encephalopathy
          - Fatigue
          - Fever/sweats/chills
          - Headache
          - Myalgias
          - Myocarditis
          - Neck pain
          - Other rash
          - Palpitations
          - Paresthesias
          - Visual/auditory impairments
      - **No** → **Not a case**
  - **No, does not meet lab criteria** → **Not a case**
    - Positive ELISA/EIA/IFA only OR
    - IgM WB/IB only OR
    - IgM WB/IB collected >30 days after onset

Flowchart Revised March 2017

Adapted from the CSTE/CDC National Surveillance Case Definition (2017 Revision) available at www.cdc.gov

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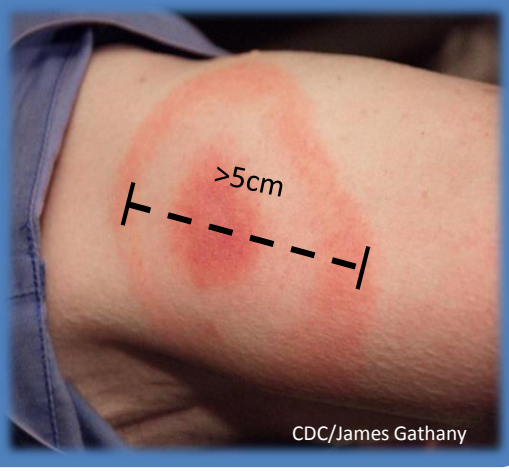
Guidance for Lyme Disease Case Report Classification

1. Erythema migrans (EM) is the rash characteristic of acute Lyme disease infection and appears usually 7-10 days (range 1-33 days) after a tick bite. Often referred to as the "bull's-eye rash" it may appear either as a single expanding red patch, or a central spot surrounded by clear skin that is in turn ringed by an expanding red rash. Erythema migrans occurs in 70% of all cases of Lyme disease.

   If EM rash is indicated in the case report, or reported by the patient; please **verify** that the rash was documented by a physician or other health care professional in the medical record.

   EM rash is often accompanied by acute symptoms such as: fatigue, fever, headache, stiff neck, arthralgia or myalgia.

   To fit case definition, EM rash must be >5cm diameter and **diagnosed by a physician.**



3. Two-tier testing includes an initial screen by enzyme immunoassay (EIA, ELISA, or C6 peptide) or indirect immunofluorescence assay (IFA), followed by a Western Immunoblot (WB or IB) on any positive or equivocal EIA, ELISA, C6 or IFA results.

4. Late stage manifestations include EM rash or any of the following: arthritis (objective episodes of joint swelling), Bells palsy or other cranial neuritis, encephalomyelitis (CSF titer must be higher than serum titer), lymphocytic meningitis, radiculoneuropathy, or 2nd or 3rd degree atrioventricular block.

5. Non-specific signs or symptoms include arthralgia, bundle branch block, cognitive impairment, encephalopathy, fatigue, fever/sweats/chills, headache, myalgias, myocarditis, neck pain, other rash, palpitations, paresthesias, visual/auditory impairments.

2. Not all ticks carry or transmit Lyme disease. Patients may not have removed a tick or remember a tick bite so it is important to determine if there was exposure to wooded or grassy habitats in a high-incidence state or a low-incidence state less than or equal to 30 days before the onset of clinical signs. Since infected ticks are not uniformly distributed, a detailed history to verify whether exposure occurred in a high or low incidence state is needed. A high-incidence state is defined as those states with the average Lyme disease incidence of at least 10 confirmed cases/100,000 for the previous three years. A low-incidence state is defined as those states with the average disease incidence of < 10 confirmed cases/100,000. As of 2017, Michigan is considered a low-incidence state. High-incidence states for 2017 include (www.cdc.gov/lyme/stats/tables.html):

   - Connecticut (CT)
   - Delaware (DE)
   - Maine (ME)
   - Maryland (MD)
   - Massachusetts (MA)
   - Minnesota (MN)
   - New Hampshire (NH)
   - New Jersey (NJ)
   - New York (NY)
   - Pennsylvania (PA)
   - Rhode Island (RI)
   - Vermont (VT)
   - Virginia (VA)
   - Wisconsin (WI)

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