

LYME DISEASE

Last revised May 22, 2012

I. IDENTIFICATION

A. **CLINICAL DESCRIPTION:** A multi-systemic disease caused by a spirochete *Borrelia burgdorferi* that is transmitted through the bite of infected deer ticks (*Ixodes scapularis*) in Wisconsin. Within 3-30 days of the bite, 70-80% of those infected exhibit a distinctive rash called erythema migrans (EM) that expands in size over a period of days or weeks (see description in Definitions and Clarifications below). However, about 25% of the patients do not have the EM rash or the lesions are unnoticed by the patients. The expansion of the EM rash helps to differentiate from an allergic reaction at the site of the bite; unlike the EM rash, the allergic reaction does not expand and disappears within a few days. EM is often accompanied by malaise, fatigue, headache, fever, chills, and swollen lymph nodes. After several weeks to months, untreated patients may develop facial palsy, severe headaches, neck stiffness, migratory pain in joints, tendons, muscles or bones, neurologic abnormalities, or cardiac disturbances. After several months to years, approximately 60% of untreated patients may develop intermittent bouts of arthritis including pain and swelling in large joints, about 15% may develop neurological symptoms, and 5% may have cardiac manifestations (see Late Manifestations below).

B. WISCONSIN REPORTING CRITERIA:

Required reporting:

Laboratories must continue to report all Lyme disease positive test results.

Providers (physicians, nurse practitioners, infection preventionists, and medical professionals, etc.)

- Patient's demographics including address, birth date, gender, race, and ethnicity.
- Clinical signs of erythema migrans (EM) rash in a Wisconsin resident that has been diagnosed by a physician or a medical professional and date of onset of illness. For the purpose of surveillance, EM rash is defined as a red macule or papules that expands during a period of days to weeks to a diameter that is greater than or equal to 5cm. The skin lesion often has partial central clearing and may appear as a bull's-eye rash.

Local health departments (LHDs)

- Review reports with clinical signs of erythema migrans (EM) rash in a Wisconsin resident that has been diagnosed by a physician or a medical professional and onset date relating to the current illness.

Optional reporting:

Providers-

- Unless requested by the LHDs, reports of cases with confirmatory and non-confirmatory clinical signs and symptoms without EM rash are optional. See

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below for definition and clarification of confirmatory and non-confirmatory clinical signs and symptoms.

- Unless requested by the LHDs, reporting of signs and symptoms other than EM rash, exposure, and treatment information is now optional.

Local health departments (LHDs)

- LHDs will *not* be expected to review incoming laboratory reports or call providers for clinical signs and symptoms when a positive laboratory report is received. Lyme laboratory results that are received electronically at the LHDs or at the state will be auto-imported into WEDSS as a “Lyme laboratory report”. Paper copy of the laboratory reports received at the LHDs can be entered at the LHDs or forwarded to the state for entry. All laboratory results that have been entered into WEDSS will be accessible to LHDs.

C. **LABORATORY SURVEILLANCE CRITERIA** : For the purpose of surveillance, the definition of a qualified laboratory assay is:

- a positive culture for *B. burgdorferi*, **OR**
- two-tier testing* with IgM immunoblot seropositive result for specimens collected within 30 days of onset date, **OR**
- positive IgG immunoblot interpreted using established criteria, **OR** additional assays, including PCR, will be considered on a case-by-case basis.

D. **WISCONSIN SURVEILLANCE CASE DEFINITION**: Adapted from the revised 2007 Council of State and Territorial Epidemiologists (CSTE) Lyme disease national surveillance case definition and was effective on January 1, 2008. This surveillance case definition was developed for national reporting of confirmed and probable Lyme disease cases and is not to be used in clinical diagnosis. Complete case classification requires laboratory results and clinical signs and symptoms. As of June 1, 2012, the Wisconsin Lyme disease surveillance program required reporting of only confirmed cases with EM rash.

Confirmed case:

- Erythema migrans (EM) in a Wisconsin resident that has been diagnosed by a physician or a medical professional and is greater than or equal to 5cm in size. (Note that although the national case definition requires a known “exposure” as defined below, DPH considers the entire state of Wisconsin to be endemic. Thus, any Wisconsin resident is considered “exposed”.)

Case classifications for optional reporting

Confirmed case:

- At least one confirmatory late manifestation (described below) and laboratory evidence of infection that meets criteria listed in section “C” above.

Probable case:

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- Any other physician-diagnosed Lyme disease with laboratory evidence of infection that meets criteria listed in section “C” above, with only non-confirmatory signs and symptoms (see description below).

Suspect case:

- Any positive laboratory test with no clinical information available (e.g. a laboratory report without a case report form).

Note: please document in the notes section of WEDSS if unable to obtain clinical information after contacting the patient provider.

Not a Case:

- Any case report that does not meet the confirmed, probable, or suspect category.

Definitions and Clarifications:

Erythema migrans (EM)

For the 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 creating a “bull’s-eye” appearance. To meet the case definition a single primary lesion must reach greater than or equal to 5 cm in size across its largest diameter. Secondary lesions may also occur. A hallmark of EM is its gradual expansion over several days. 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.

Confirmatory late manifestations

Confirmatory signs and symptoms include any of the following when an alternate explanation is not found:

1. Musculoskeletal system. Recurrent, intermittent 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.
2. Nervous system. Any of the following, alone or in combination: lymphocytic meningitis; cranial neuritis, particularly facial palsy (may be bilateral); radiculoneuropathy; or, rarely, encephalomyelitis. Encephalomyelitis must be confirmed by demonstration of antibody production against *B. burgdorferi* in the CSF, evidenced by a higher titer of antibody in CSF than in serum. Headache, fatigue, paresthesia or mildly stiff neck alone is not criteria for neurologic involvement.
3. 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.

Non-confirmatory

Non-confirmatory signs and symptoms include fever, sweats, chills, fatigue, neck pain, arthralgias, myalgias, fibromyalgia syndromes, cognitive impairment, headache, paresthesias, visual/auditory impairment, peripheral neuropathy, encephalopathy, palpitations, bradycardia, bundle branch block, myocarditis, or other rash.

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) in a county in which Lyme disease is endemic. A history of tick bite is not required. For the purpose of surveillance, DPH considers all Wisconsin residents to be exposed.

Endemic County

A county in which at least two confirmed cases have been acquired or in which established populations of a known tick vector are infected with *B. burgdorferi*. For the purpose of surveillance, DPH considers all Wisconsin counties to be endemic.

II. ACTIONS REQUIRED / PREVENTION MEASURES

A. WISCONSIN DISEASE SURVEILLANCE CATEGORY II:

Report to the patient's local health department either electronically through the Wisconsin Electronic Disease Surveillance System (WEDSS), by mail or fax using an Acute and Communicable Disease Case Report ([F-44151](#)), or by other means within 72 hours upon recognition of a case or suspected case.

B. EPIDEMIOLOGY REPORTS REQUIRED:

- *Electronically* – Report through WEDSS, including appropriate disease-specific tabs (preferred method)
OR
- *Paper Copy* – Wisconsin Lyme Disease Case Report Form CDES #107 Rev 05/11

Required information includes:

- Patient name, address, gender, race, ethnicity, date of birth, EM rash observation by health professional that are greater than or equal to 5cm in diameter and the date of clinical onset.

C. PUBLIC HEALTH INTERVENTIONS:

In accordance with Wisconsin Administrative rule DHS 145.05, local public health should follow the methods of control recommended in the current edition of *Control of Communicable Diseases Manual*, edited by David L. Heymann, published by the American Public Health Association.

- LHDs should train their local providers to report all cases of EM rash meeting surveillance criteria and encourage their local providers to report via WEDSS instead of submitting cases by paper copy.

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D. PREVENTION MEASURES: (if applicable)

- Patient education as needed to minimize future tick exposure.

III. CONTACTS FOR CONSULTATION

A. LOCAL HEALTH DEPARTMENT – REGIONAL OFFICES – TRIBAL AGENCIES:

<http://www.dhs.wisconsin.gov/localhealth/index.htm>

B. BCDER / COMMUNICABLE DISEASE EPIDEMIOLOGY SECTION: Vectorborne Epidemiologist at 608-267-0249.

C. WISCONSIN STATE LABORATORY OF HYGIENE / SEROLOGY: (608) 262-0248 performs Western Immunoblot (IgM and IgG) testing on serum specimens. Other tests not available at the WSLH may be forwarded to CDC as appropriate.

D. TICK IDENTIFICATION: The public can send in ticks or pictures electronically for identification at no charge through the University of Wisconsin, Department of Entomology. Please contact DPH for further information.

IV. RELATED REFERENCES

- Heymann DL, ed. Lyme Disease In: *Control of Communicable Diseases Manual*. 19th ed. Washington, DC: American Public Health Association, 2008: 364-369.
- Pickering LK, ed. Lyme Disease. In: *Red Book: 2009 Report of the Committee on Infectious Diseases*. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2009: 430-435.