2018 Guidelines for the Reporting of Lyme Disease Cases Using the Michigan Disease Surveillance System (MDSS)

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2018 GUIDELINES FOR THE REPORTING OF LYME DISEASE CASES USING THE MICHIGAN DISEASE SURVEILLANCE SYSTEM (MDSS)

INTRODUCTION

The following guidance is provided to aid the investigation and reporting of Lyme disease cases for surveillance purposes in the MDSS. For a complete description of Lyme disease reporting criteria, the updated 2017 National Surveillance Case Definition for Lyme disease can be found at: https://wwwn.cdc.gov/nndss/conditions/lyme-disease/

REQUIRED INFORMATION AND DOCUMENTATION

The following information is essential for determining case status:

- Date of illness onset
- Complete clinical presentation
- Detailed laboratory results
- Exposure to potential tick habitats (wooded, brushy, or grassy areas) in a "High or Low Incidence" Lyme disease state[1]. History of a tick bite is not required, but travel information is important. **Laboratory confirmation (see below) is recommended for persons with no known exposure.**

IF THE ABOVE INFORMATION SUPPORTS CONSIDERATION OF LYME DISEASE, CASE CLASSIFICATION ("CASE STATUS") IS DETERMINED AS FOLLOWS:

CONFIRMED:

1. Physician verified Erythema Migrans (EM) lesion (≥5cm diameter) with a **known exposure in a high incidence state[1]**
2. Physician verified EM with a **known exposure in a low incidence state[1]** and with laboratory evidence of infection such as:
    a. A positive culture for *B. burgdorferi*
    OR
    b. Two-tier testing including both:
        - Screening EIA or IFA Lyme antibody test, with positive or equivocal result **AND**
        - IgM or IgG Western Blot positive result
    OR
    c. Single-tier IgG Western Blot positive result
3. A case with at least one late manifestation (**see the Michigan Lyme disease classification flowchart below for a list of late manifestations**) with laboratory evidence of infection as described above.

PROBABLE: Any other physician diagnosed case of Lyme disease that has laboratory evidence of infection as described above.

SUSPECT:

1. A case of physician diagnosed EM with no known exposure **and** no laboratory evidence of infection.
2. A case with laboratory evidence of infection (as described above) but no clinical information (e.g., a laboratory report).*

* MDHHS will not support cases categorized as "Suspect" using this criteria. All cases must have accompanying clinical information or be classified as "not a case".

ENTERING DATA INTO THE MDSS

- Case determination requires that all of the above information be entered into the MDSS using the detailed Lyme Disease Case Report form in the MDSS. If the Case Report Form in the MDSS is not utilized, please fax case reports and laboratory testing results to MDHHS at (517) 335-8263.
- Once the necessary information is collected, the local level MDSS user can then determine if the reported case meets the 2017 CDC Lyme Disease Surveillance Case Definition. Based on that assessment, choose the appropriate "Case Status" field: "Confirmed" "Probable", "Suspect", or "Not a Case" (as described above). State epidemiologists will review case investigations based on clinical presentation, exposure history, and laboratory testing and may change 'case status' or 'investigation status' upon that review.
- Case status may be changed by state epidemiologists. The local health department will be notified when a change is made, either by notes left in re-activated case investigations or by phone call to request further information.

For questions about this document, please call 517-335-8165.
For up-to-date information about Lyme disease in Michigan, please visit the Michigan Emerging Diseases website at:
WWW.MICHIGAN.GOV/EMERGINGDISEASES

1. 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 within 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)

GUIDELINES FOR COMPLETING ELECTRONICALLY REPORTED "TICK IDENTIFICATION AND TESTING" RESULTS IN MDSS

INTRODUCTION

Laboratory results from MDHHS Bureau of Labs are now being automatically entered into MDSS. MDSS generates a case report based on the laboratory results. Occasionally, tick identification and testing results may appear in MDSS. While these reports are often not associated with human illness, this information may be of interest to both local and state health authorities conducting surveillance for tick-borne disease.

WHERE TO FIND RESULTS

- If a tick is determined to be a non-*Ixodes* tick species (such as a *Dermacentor variabilis* (American dog tick) or an *Amblyomma americanum* (Lone star tick)), the laboratory results can be found in MDSS under the disease category 'UNUSUAL OUTBREAK OR OCCURRENCE'. The laboratory will identify the species of such ticks, but no DFA testing will be performed since only *Ixodes scapularis* ticks are of concern in the transmission of Lyme disease. Therefore, no DFA results will be listed in the laboratory results section of the report.
    - To search for MDHHS laboratory results within the category 'Unusual Outbreak or Occurrence,' use a NEW SEARCH in MDSS. Choose the 'Unusual Outbreak or Occurrence' category, and then use the ADVANCED tab at the bottom of the screen. Under laboratory name in the ADVANCED tab, type *MDHHS* (asterisks included), and conduct the search. This will not isolate tick-testing results, but will limit the search to labs reported from MDHHS within your jurisdiction, within a given timeframe.
    - The local level user can then COMPLETE the 'investigation status' and determine the 'case status' to be NOT A CASE. No further investigation is necessary.

- If a tick is determined to be an *Ixodes scapularis* (blacklegged tick) it may then be tested by DFA. Ticks with a positive result will be electronically entered into MDSS under the 'LYME DISEASE' case category. However, this does not mean that a human case of Lyme disease actually occurred, so the case report can still be COMPLETED by the local level user as NOT A CASE.
    - Tick identification and testing is performed in support of the clinical evaluation performed by a physician and/or serologic testing. **In an instance of a positive tick result, patient follow-up should be conducted.**
    - Tick identification and testing is also important in identifying areas in Michigan where blacklegged ticks, the vector of Lyme disease, are common. Citizens are urged to submit ticks for identification, preferably through the local health department, if found on a person. Additional information about submitting ticks for identification and testing can be found at www.michigan.gov/lymedisease.

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

Michigan Department of Health and Human Services

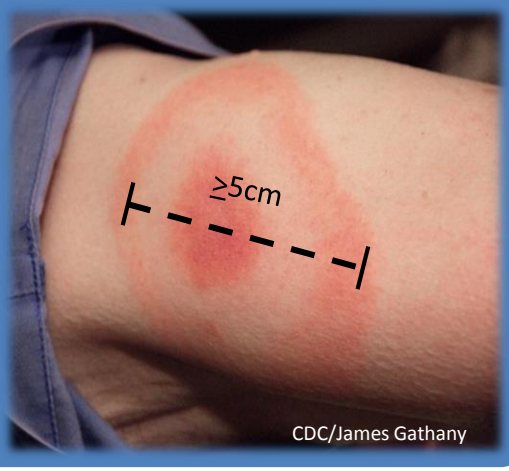
Guidance for Lyme Disease Case Report Classification

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 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)

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

MDHHS
Michigan Department of Health & Human Services

Lyme Disease/*Borrelia burgdorferi* Laboratory Results Interpretation Key

Lyme disease laboratory results may be confusing as the language used by various commercial laboratories is not standardized. This document is meant to support the case investigator by providing a clear connection between the reported laboratory results, and the test-types acceptable by the 2017 CSTE National Surveillance Case Definition. Laboratory criteria for diagnosis of Lyme disease, according to the case definition, are shown below.

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 (IgM)* or Immunoglobulin G (IgG) western immunoblot (WB) for Lyme disease) OR**
- **A positive single-tier IgG WB test for Lyme disease.**
  * IgM results for specimens collected >30 days after symptom onset are unreliable and do not meet case definition criteria.

In the table below, the left column contains electronic commercial laboratory results, as typically displayed in the MDSS. The middle column ("Test type") identifies the test methodology for each, so that case investigators can more easily determine if the laboratory criteria for a case of Lyme disease is met.

"**Disregard**" is used for results that relate to individual components of a serologic panel (for example, individual Western Blot bands), which on their own may be uninterpretable. Typically these reports will also contain a summary interpretation, for example, *B. burgdorferi* IgG Immunoblot; positive or negative, which can be used to help classify the case.

This table may not include all possible Lyme disease test result names, therefore, if the case investigator cannot find a test name and would like assistance determining the correct test type, please contact the MDHHS EZID Section (517-335-8165).

Laboratory Test Result name, by reporting laboratory	Test type
ARUP Laboratories	
B. burgdorferi Antibody IgM Immunoblot/	Western Blot IgM
B. burgdorferi Antibody IgM Immunoblot/null	Western Blot IgM
B. burgdorferi IgG Immunoblot/	Western Blot IgG
B. Burgdorferi, IgG WB/	Western Blot IgG
B. Burgdorferi, IgG WB/null	Western Blot IgG
B.Burgdorferi Antibody, IgM By WB/	Western Blot IgM
B.Burgdorferi Antibody, IgM By WB/null	Western Blot IgM
Borrelia burgdorferi C6 Pep Abs, ELISA/null	C6 peptide
Aspirus (all locations)	
B burgdor Ab XXX EIA-aCnc/LYME INDEX VALUE	EIA
B burgdor IgG Ser Ql IB/LYME IgG WEST BLOT	Western Blot IgG
B burgdor IgG+IgM Ser EIA-Imp/LYME ANTIBODY	EIA
B burgdor IgM Ser Ql IB/LYME IgM WEST BLOT	Western Blot IgM
Beaumont Royal Oak	
Borrelia burgdorferi IgG Ab [Presence] in Serum by Immunoblot (IB)/MDCH-Lyme Antibodies IgG Immunoblot	Western Blot IgG
Borrelia burgdorferi IgM Ab [Presence] in Serum by Immunoblot (IB)/MDCH- Lyme Antibodies IgM Immunoblot	Western Blot IgM
Borgess Medical Center	
BORRELIA BURGDORFERI AB.IGG:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgG Qualitative Serum	Western Blot IgG
BORRELIA BURGDORFERI AB.IGG+IGM:ACNC:PT:SER:ORD:/Lyme disease (Borrelia burgdorferi) Antibody	EIA
BORRELIA BURGDORFERI AB.IGM:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgM Qualitative Serum	Western Blot IgM
Lyme disease (Borrelia burgdorferi) Antibody/Lyme disease (Borrelia burgdorferi) Antibody	EIA
Bronson (all locations)	
Borrelia burgdorferi Ab.IgG band pattern:Imp:Pt:Ser:Nom:IB/IgG BAND(S)	*Disregard*
Borrelia burgdorferi Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG IMMUNOBLOT	Western Blot IgG
Borrelia burgdorferi Ab.IgM band pattern:Imp:Pt:Ser:Nom:IB/IgM BAND(S)	*Disregard*
Borrelia burgdorferi Ab.IgM:ACnc:Pt:Ser:Ord:IB/IgM IMMUNOBLOT	Western Blot IgM
Borrelia burgdorferi IgG and IgM [interpretation] in Serum by Immunoassay/LYME IGG IGM	EIA
Covenant HealthCare	
BORRELIA BURGDORFERI AB.IGG:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgG Qualitative Serum	Western Blot IgG
BORRELIA BURGDORFERI AB.IGM:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgM Qualitative Serum	Western Blot IgM
BORRELIA BURGDORFERI AB:ACNC:PT:SER:ORD:EIA/Lyme disease (Borrelia burgdorferi) Antibody	EIA
BORRELIA BURGDORFERI AB:PRTHR:PT:SER:ORD:IA/Lyme disease (Borrelia burgdorferi) Antibody	EIA
IGeneX, Inc.	
Lyme Western Blot IgG (CDC Interpretation ONLY*)	Western Blot IgG
*IGeneX provides multiple interpretations for Western blot testing. ONLY CDC interpretation criteria are valid for case classification	
Lyme Western Blot IgG (IGeneX interpretation)	*Disregard*
Lyme Western Blot IgM (CDC Interpretation ONLY*)	Western Blot IgM
*IGeneX provides multiple interpretations for Western blot testing. ONLY CDC interpretation criteria are valid for case classification	
Lyme Western Blot IgM (IGeneX interpretation)	*Disregard*

LabCorp	
Borrelia burgdorferi Ab.IgG band pattern/Lyme IgG WB Interp.	Western Blot IgG
Borrelia burgdorferi Ab.IgG+IgM/Lyme IgG/IgM Ab	EIA
Borrelia burgdorferi Ab.IgM band pattern/Lyme IgM WB Interp.	Western Blot IgM
Borrelia burgdorferi Ab.IgM/Lyme Disease Ab, Quant, IgM	EIA
Borrelia burgdorferi C6 Ab/C6 Borrelia burgdorferi (Lyme)	C6 peptide

Marquette General Hospital	
Borrelia burgdorferi 18kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P18 Ab	*Disregard*
Borrelia burgdorferi 23kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P23 Ab	*Disregard*
Borrelia burgdorferi 23kD Ab.IgM:ACnc:Pt:Ser:Ord:IB/IgM P23 Ab	*Disregard*
Borrelia burgdorferi 28kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P28 Ab	*Disregard*
Borrelia burgdorferi 30kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P30 Ab	*Disregard*
Borrelia burgdorferi 39kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P39 Ab	*Disregard*
Borrelia burgdorferi 39kD Ab.IgM:ACnc:Pt:Ser:Ord:IB/IgM P39 Ab	*Disregard*
Borrelia burgdorferi 41kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P41 Ab	*Disregard*
Borrelia burgdorferi 41kD Ab.IgM:ACnc:Pt:Ser:Ord:IB/IgM P41 Ab	*Disregard*
Borrelia burgdorferi 45kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P45 Ab	*Disregard*
Borrelia burgdorferi 58kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P58 Ab	*Disregard*
Borrelia burgdorferi 66kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P66 Ab	*Disregard*
Borrelia burgdorferi 93kD Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG P93 Ab	*Disregard*
Borrelia burgdorferi Ab.IgG band pattern:Imp:Pt:Ser:Nom:IB/Lyme IgG WB Interp	Western Blot IgG
Borrelia burgdorferi Ab.IgG+IgM:ACnc:Pt:Ser:Qn/Lyme Antibody	EIA
Borrelia burgdorferi Ab.IgM band pattern:Imp:Pt:Ser:Nom:IB/Lyme IgM WB Interp	Western Blot IgM

Mayo Clinic Dept of Med and Pathology	
BORRELIA BURGDORFEI IGG BAND PATTERN/IGG BAND(S)	*Disregard*
BORRELIA BURGDORFEI IGM BAND PATTERN/IGM BAND(S)	*Disregard*
BORRELIA BURGDORFERI AB BAND PATTERN/INTERPRETATION	*Disregard*
BORRELIA BURGDORFERI AB IGM/IGM IMMUNOBLOT	Western Blot IgM
BORRELIA BURGDORFERI IGG BAND PATTERN/IGG BAND(S)	*Disregard*
BORRELIA BURGDORFERI IGM BAND PATTERN/IGM BAND(S)	*Disregard*
BORRELIA BURGODORFERI AB, IGG/IGG IMMUNOBLOT	Western Blot IgG

McLaren Main Lab - Flint	
Borrelia burgdorferi Ab.IgG:ACnc:Pt:Ser:Ord/Lymes Antibody	EIA
Borrelia burgdorferi Ab.IgG:ACnc:Pt:Ser:Qn/Lymes AB Unit	EIA

MDHHS Regional Lab - Lansing	
Borrelia burgdorferi Ab band pattern/Lyme Western Blot	EIA**, Western Blot IgM and IgG
**MDHHS lab does not report screening test, but if WB was performed, then you can assume the EIA was positive.	
Borrelia burgdorferi Ag/Borrelia burgdorferi	Tick-testing result*** Not human specimen
***Blacklegged ticks received alive by the Michigan Tick Identification and Testing Program may be tested for Lyme disease. These results may be used to initiate or supplement a case investigation.	

MidMichigan Medical Center (all locations)	
B burgdor Ab Patrn Ser IB-Imp/INTERPRETATION (LYME)	*Disregard*
B burgdor IgG Patrn Ser IB-Imp/IgG BAND(S)	*Disregard*
B burgdor IgG Ser Ql IB/LYME IgG WESTERN BLOT	Western Blot IgG
B burgdor IgM Patrn Ser IB-Imp/IgM BAND(S)	*Disregard*
B burgdor IgM Ser Ql IB/LYME IgM WESTERN BLOT	Western Blot IgM

Quest Diagnostic Wood Dale	
B BURGDOR AB SER QL EIA/LYME AB SCREEN	EIA
B BURGDOR AB SER EIA-ACNC/LYME AB SCREEN	EIA
B BURGDOR IGG SER QL IB/LYME DISEASE AB(IGG),BLOT	Western Blot IgG
B BURGDOR IGM SER QL IB/LYME DISEASE AB(IGM),BLOT	Western Blot IgM
B BURGDOR18KD IGG SER QL IB/18 KD (IGG) BAND	*Disregard*
B BURGDOR23KD IGG SER QL IB/23 KD (IGG) BAND	*Disregard*
B BURGDOR23KD IGM SER QL IB/23 KD (IGM) BAND	*Disregard*
B BURGDOR28KD IGG SER QL IB/28 KD (IGG) BAND	*Disregard*
B BURGDOR30KD IGG SER QL IB/30 KD (IGG) BAND	*Disregard*
B BURGDOR39KD IGG SER QL IB/39 KD (IGG) BAND	*Disregard*
B BURGDOR39KD IGM SER QL IB/39 KD (IGM) BAND	*Disregard*
B BURGDOR41KD IGG SER QL IB/41 KD (IGG) BAND	*Disregard*
B BURGDOR41KD IGM SER QL IB/41 KD (IGM) BAND	*Disregard*
B BURGDOR45KD IGG SER QL IB/45 KD (IGG) BAND	*Disregard*
B BURGDOR58KD IGG SER QL IB/58 KD (IGG) BAND	*Disregard*
B BURGDOR66KD IGG SER QL IB/66 KD (IGG) BAND	*Disregard*
B BURGDOR93KD IGG SER QL IB/93 KD (IGG) BAND	*Disregard*

South Haven Hospital	
Borrelia burgdorferi Ab.IgG band pattern:Imp:Pt:Ser:Nom:IB/IgG BAND(S)	*Disregard*
Borrelia burgdorferi Ab.IgG:ACnc:Pt:Ser:Ord:IB/IgG IMMUNOBLOT	Western Blot IgG
Borrelia burgdorferi Ab.IgM band pattern:Imp:Pt:Ser:Nom:IB/IgM BAND(S)	*Disregard*
Borrelia burgdorferi Ab.IgM:ACnc:Pt:Ser:Ord:IB/IgM IMMUNOBLOT	Western Blot IgM
Borrelia burgdorferi IgG and IgM [interpretation] in Serum by Immunoassay/LYME IGG IGM	EIA

Sparrow Labs	
Lyme Antibodies/	EIA
Lyme Antibodies/null	EIA

Spectrum Butterworth	
BORRELIA BURGDORFERI AB.IGG BAND PATTERN:IMP:PT:SER:NOM:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgG Qualitative Serum	Western Blot IgG
BORRELIA BURGDORFERI AB.IGG:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgG Qualitative Serum	Western Blot IgG
BORRELIA BURGDORFERI AB.IGG+IGM:ACNC:PT:SER:ORD:/Lyme disease (Borrelia burgdorferi) Antibody	EIA
BORRELIA BURGDORFERI AB.IGM BAND PATTERN:IMP:PT:SER:NOM:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgM Qualitative Serum	Western Blot IgM
BORRELIA BURGDORFERI AB.IGM:ACNC:PT:SER:ORD:IB/Lyme disease (Borrelia burgdorferi) Western Blot IgM Qualitative Serum	Western Blot IgM

St. Mary's of Saginaw	
Borrelia burgdorferi Ab.IgG IgM:Imp:Pt:Ser:Nom:EIA/Lyme Disease Antibody	EIA

University of Michigan	
B burgdor IgG Ser Ql IB/LYME IgG WEST BLOT	Western Blot IgG
B burgdor IgG Ser Ql IB/LYME IgM WEST BLOT	Western Blot IgM

Warde	
Borrelia Burgdorferi Total IgG/IgM Antibody	EIA
B. burgdorferi Ab IgG/IgM IB	Western Blot IgM and IgG