

MDHHS BUREAU OF LABORATORIES

MOSQUITO-BORNE AND TICK-BORNE

DISEASE TESTING

MOSQUITO-BORNE DISEASES

The Michigan Department of Health and Human Services Bureau of Laboratories (MDHHS BOL) offers comprehensive testing on clinical specimens for the following viral mosquito-borne diseases (also known as arboviruses) of concern in Michigan: **California Group encephalitis viruses including La Crosse encephalitis virus (LAC) and Jamestown Canyon virus (JCV), Eastern Equine encephalitis virus (EEE), St. Louis encephalitis virus (SLE), and West Nile virus (WNV)**. Testing is available free of charge through Michigan healthcare providers for their patients. Testing for mosquito-borne viruses should be considered in patients presenting with meningitis, encephalitis, or other acute neurologic illness in which an infectious etiology is suspected during the summer months in Michigan. Methodologies include:



- IgM detection for five arboviruses (LAC, JCV, EEE, SLE, WNV)
- Molecular detection (PCR) for WNV only
- Plaque Reduction Neutralization Test (PRNT) is also available and may be performed on select samples when indicated

The preferred sample for arbovirus serology at MDHHS BOL is cerebral spinal fluid (CSF), followed by paired serum samples (acute and convalescent). In cases where CSF volume may be small, it is recommended to also include an acute serum sample. Please see the following document for detailed instructions on specimen requirements, shipping and handling instructions: http://www.michigan.gov/documents/LSGARbovirus_IgM_Antibody_Panel_8347_7.doc

Michigan residents may also be exposed to mosquito-borne viruses when traveling domestically or internationally. In recent years, the most common arboviruses impacting travelers include dengue, Zika and chikungunya virus. MDHHS has the capacity to perform PCR for dengue, chikungunya and Zika virus and IgM for dengue and Zika virus to confirm commercial laboratory arbovirus findings or for complicated medical investigations. MDHHS BOL no longer performs routine screening for Zika virus as assays are now available through commercial laboratories. To discuss a case and request travel-associated arbovirus testing, contact the MDHHS Emerging and Zoonotic Diseases Section (EZID) at 517-335-8165. Information about requirements for sample submission can be found at www.michigan.gov/mdhhslab, A-Z Test Listing, "Arbovirus-Emerging Arbovirus Panel".

TICK-BORNE DISEASES

Human Serologic Testing for Lyme Disease

The MDHHS BOL offers the Centers for Disease Control and Prevention's recommended two-step testing for detection of antibodies to *Borrelia burgdorferi*, the causative agent of **Lyme disease**, using a modified two-tier test methodology (MTTT) and [following national recommendations](#).



- The first step uses a Lyme VlsE1/pepC10 IgG/IgM enzyme immune assay (EIA). If a sample is positive or equivocal, then-

- The second step is performed using the Zeus IgG and IgM Whole Cell *B. burgdorferi* EIA.

Guidance for interpretation of Lyme Disease Serologic Assays can be found [here](#).

Testing for Lyme disease is available free of charge through Michigan healthcare providers for their patients. Please see the following document for detailed instructions on specimen requirements, shipping, and handling instructions: https://www.michigan.gov/documents/mdhhs/AZ.041_Lyme_VlsE1_pepC10_IgG_IgM_723969_7.doc

Tick Identification

MDHHS provides the following services for tick identification at no charge to Michigan healthcare providers and citizens:

- The Emerging Zoonotic & Infectious Diseases (EZID) Section accepts ticks or photos of ticks for identification. Disease risk varies with [different kinds of ticks](#).
- Email tick photos and questions about tick-borne diseases to MDHHS-Bugs@michigan.gov. For details on how to submit ticks or photos of ticks to MDHHS EZID for tick identification, visit www.michigan.gov/lyme.



MDHHS and the CDC do not recommend testing ticks removed from people for disease-causing organisms or using [tick testing](#) results to guide treatment decisions. However, knowing the type of tick that has bitten a person and where that tick was encountered can help healthcare providers assess the [risk from a tick bite](#).

Rickettsia RT-PCR Assay

The MDHHS BOL now has the capacity to test specimens of whole blood (preserved in EDTA or acid citrate dextrose solution A) for the presence of *Rickettsia rickettsii* (causative agent of [Rocky Mountain Spotted Fever](#) or RMSF) and *Rickettsia prowazekii* ([Epidemic typhus](#)) DNA.

For suspect RMSF cases:

- Early recognition and treatment with doxycycline is critical to patient survival.
- Do not delay treatment while waiting for diagnostic test results.
- Although a positive PCR test result is helpful, a negative test does not rule out the diagnosis and treatment should not be withheld due to a negative result.
- A [skin biopsy](#) from a rash lesion can be another useful specimen that can be submitted to the Centers for Disease Control and Prevention (CDC) Rickettsial Zoonosis Branch, by special arrangement.
- A combination of molecular assays on whole blood and/or a skin biopsy and acute and convalescent serum specimens can assist with making a definitive diagnosis of RMSF.

Please contact EZID Section staff at 517-335-8165 about submitting specimens for RMSF testing to MDHHS BOL or CDC.

SPECIALIZED TESTING AVAILABLE AT CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

Michigan residents may also be exposed to other mosquito-borne and tick-borne diseases, both in Michigan or when traveling, either domestically or internationally. Testing for many less common mosquito and tick-borne pathogens is available at no cost through the CDC **with prior approval**. Information about specific diseases and diagnostic testing available at CDC can be located at www.cdc.gov. Clinical specimen submissions to CDC must be coordinated through

Michigan Department of Health and Human Services
Emerging and Zoonotic Infectious Diseases Section
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MDHHS. Contact the MDHHS EZID Section at 517-335-8165 to discuss a case with an epidemiologist and obtain authorization and instructions on how to submit patient samples to CDC.



DISEASE REPORTING REQUIREMENTS

Mosquito-borne and tick-borne infections in people are reportable conditions in Michigan (http://www.michigan.gov/documents/mdch/Reportable_Diseases_Michigan_by_Condition_478488_7.pdf) and must be reported to MDHHS and the local health department where the case patient lives. An important goal of mosquito-borne and tick-borne disease surveillance is to monitor for changes in disease activity, including identifying disease agents currently being spread by mosquitoes and ticks in Michigan, as well as potentially identifying emerging threats. Michigan's Public Health Code, Act No. 368 of the Public Acts of 1978, authorizes MDHHS and Michigan local health departments to investigate potential human cases of any reportable disease as well as unusual occurrences. **As a part of this ongoing surveillance effort, MDHHS epidemiologists routinely follow up on any Michigan patient with testing that indicates recent exposure to a mosquito-borne or tick-borne disease. Laboratories may be asked to forward remaining samples on these patients to MDHHS for confirmatory testing.**

Questions about MDHHS mosquito-borne and tick-borne disease surveillance can be directed to the EZID Section at 517-335-8165.

Questions about submitting specimens to MDHHS BOL can be directed to 517-335-8063.

Information about West Nile virus, Lyme disease and other diseases spread by mosquitoes and ticks can be found at www.michigan.gov/emergingdiseases, and www.cdc.gov.