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MEMORANDUM

DATE: May 31, 2022

TO: Healthcare Providers in Ohio

FROM: Kristen Dickerson, PhD, MSN, MPH, RN, MLT (ASCP) *Kristen Dickerson*
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Chief, Bureau of Infectious Diseases

SUBJECT: Annual Update on Diagnosis and Surveillance for Tickborne Diseases

Lyme disease and other tickborne illnesses continue to increase and cause significant morbidity in Ohio. Additionally, in 2021, Ohio reported the first case of Powassan Virus acquired within the state. Powassan virus is transmitted by several tick species and belongs to a group of viruses that can cause encephalitis and meningitis. The Ohio Department of Health (ODH) continues to work on improving surveillance and increasing awareness and education to reduce overall disease burden in the state. This update is intended to encourage patient education on the prevention of tickborne illness, as well as to provide a reminder about diagnosis, treatment, and reporting.

Actions for Ohio Clinicians

1. For information, statistics, and prevention resources, please see and/or direct patients to the ODH tickborne disease website: www.odh.ohio.gov/tick
2. Consider tickborne diseases as a differential when evaluating patients with febrile illness, with or without a rash. See <https://www.cdc.gov/ticks/symptoms.html> for more information about symptoms of tickborne disease. The attached figure shows various forms of erythema migrans (EM) rash associated with Lyme disease.
3. Familiarize yourself with the laboratory tests available to diagnose tickborne illness:

Lyme disease

- Use a two-tier approach to test for *Borrelia burgdorferi* or *Borrelia mayonii* infection using an enzyme immunoassay (EIA) or indirect immunofluorescence antibody (IFA).
- All specimens positive or equivocal by EIA or IFA should be reflexed for a Western immunoblot. Additional testing is not warranted if specimens are negative by EIA or IFA.
- Isolation of *B. burgdorferi* or *B. mayonii* in culture.
- Detection of *B. burgdorferi* or *B. mayonii* in clinical specimen by a *B. burgdorferi* group-specific nucleic acid amplification test (NAAT) assay.
- Detection of *B. burgdorferi* group-specific antigens by immunohistochemical assay on biopsy or autopsy tissues.
- **Note:** In accordance with Centers for Disease Control and Prevention reporting guidance, an EM rash without laboratory confirmation is not considered specific enough to report as a Lyme disease case in Ohio.

Anaplasmosis, ehrlichiosis and spotted fever group rickettsiosis

- IFA testing of at least two serum samples collected 2-4 weeks apart during acute and convalescent phases of illness OR
- PCR amplification of DNA extracted from whole blood specimens collected during the acute state of illness.
- Serologic sensitivity is poor in the early stages of infection. If serology is negative in patients with possible early infection, repeat serology 3 to 4 weeks later which may demonstrate seroconversion.

Babesiosis

- A positive Babesia IFA result for immunoglobulin M (IgM) is insufficient for diagnosis in the absence of a positive IFA result for IgG (or total Ig). If the IgM result is positive but the IgG result is negative, a follow-up blood specimen drawn at least one week after the first should be tested. If the IgG result remains negative in the second specimen, the IgM result is likely a false positive.

Powassan Virus

- Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, cerebrospinal fluid (CSF) or other body fluid OR
- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera OR
- Virus-specific IgM antibodies in serum with confirmatory virus specific neutralizing antibodies in the same or a later specimen OR
- Virus-specific IgM antibodies in CSF or serum.

4. Promptly report suspected cases of tickborne infections to your [local health department](#).
5. Remind patients to take preventive measures, including recognizing and avoiding tick habitats, using EPA registered insect repellents when outdoors, showering immediately after returning indoors, and removing ticks promptly.

Treatment for Tickborne Illness

Regardless of the ultimate cause of infection, if anaplasmosis, ehrlichiosis, Lyme disease or spotted fever group rickettsiosis is suspected, patients of all ages, including children, should be treated promptly and appropriately with doxycycline. Anaplasmosis, ehrlichiosis and spotted fever group rickettsioses are potentially fatal. Since laboratory confirmation of infection may take weeks, therapy should not be delayed pending diagnosis. Babesiosis can be treated with a combination of two prescription medications: Atovaquone PLUS azithromycin; OR Clindamycin PLUS quinine. There is no medication to treat Powassan virus infection, clinical management is supportive. Additional information on treatment of tickborne diseases can be found at www.cdc.gov/ticks.

Additional Information

More detailed information about Lyme disease and other tickborne diseases in Ohio, as well as information on personal protection, disease prevention and educational materials can be found on the ODH tickborne disease website: www.odh.ohio.gov/tick. Please contact your [local health department](#) or the ODH Zoonotic Disease Program at 614-752-1029 if you have questions or would like to order educational materials. Thank you for your consideration to improving tick-borne disease surveillance in Ohio.