

June 6, 2022

Annual Update on Diagnosis and Surveillance for Tickborne Diseases

Summary

According to the CDC, 75 percent of emerging infectious diseases come from animals. Recognizing this, the Delaware Public Health District works to protect the public from disease through surveillance, education, and control measures where appropriate. Ticks are carriers of a number of diseases that can affect humans, including Lyme Disease and Rocky Mountain Spotted Fever. To prevent tick-borne disease, the Delaware Public Health District provides education and surveillance and responds to human disease occurrence. For information on identification of ticks, visit

<https://www.delawarehealth.org/wp-content/uploads/2017/08/ohiotickid1.pdf>

Background

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.

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. To aid residents in protection from ticks, the Health District provides the following advice in the acronym **TICKS**: **T**reat clothing or skin with repellants; **I**nspect yourself, clothing and gear for ticks; **C**lean and disinfect any area where a tick was removed; **K**ep record of the date the tick was removed; and **S**hower or wash off as soon as possible after coming indoors.

Recommendations

1. For information, statistics, and prevention resources, please see and/or direct patients to Delaware Public Health District's Pest Disease Control web page:
<https://www.delawarehealth.org/pest-disease-control/>
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:
 - a. 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.
- b. 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.
- c. 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.
- d. 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. 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.
5. 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

Reporting

These infections are class B reportable diseases. Healthcare providers should report cases or suspected cases to DPHD by the end of the next business day by calling (740) 368-1700 or faxing the information to 740-203-2044.

Delaware Public Health District and the Ohio Department of Health do not offer identification or lab testing of ticks for infectious diseases. Please refer to <https://odh.ohio.gov/know-our-programs/zoonotic-disease-program/resources/tickborne-diseases> for more information.

For More Information

<https://www.delawarehealth.org/wp-content/uploads/2017/08/tickbrochure.pdf>

www.odh.ohio.gov/tick

www.cdc.gov/ticks

The Many Forms of Lyme Disease Rashes (Erythema Migrans)

Faint colors and borders

Crusted centers

More than one rash

Different shapes and colors

Appearing anywhere on the body

Most people with Lyme disease develop an erythema migrans rash at the site of the tick bite. The rash usually expands slowly over several days reaching up to 12 inches or more (30 cm) across. **However, not all rashes are a sign of Lyme disease.** The redness in the picture to the left is caused by irritation to the tick bite — not a tickborne infection.

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Learn more about Lyme disease symptoms at www.cdc.gov/lyme/signs_symptoms

