



TICKBORNE DISEASE RECOMMENDATIONS DURING THE COVID-19 PANDEMIC

Date: June 1, 2020

Public Health Message Type: Alert Advisory Update Information

Intended Audience: All public health partners Healthcare providers Infection preventionists
 Local health departments Schools/child care centers ACOs
 Animal health professionals Other: Clinical laboratories

Key Points or Updates:

- (1) Tickborne diseases are a major public health concern and are some of the most commonly reported communicable diseases in New Jersey. Shelter at home orders may result in increased exposure to grassy or wooded areas. Ticks don't social distance – take steps to prevent tick bites!
- (2) Seeking medical care for tickborne illness should not be delayed due to the COVID-19 pandemic.
- (3) Anaplasmosis is increasing in New Jersey, particularly in older age groups. Illness severity has also increased, with a larger proportion of cases needing hospitalization and with a longer length of stay. While anaplasmosis is reported across the state, northwestern counties have the highest incidence rates. Many reported cases have single serology tests, which are not confirmatory.
- (4) NJDOH can provide/facilitate testing for certain tickborne diseases (Powassan, Spotted Fever Group Rickettsiosis) that cause severe illness and adverse outcomes. NJDOH can also facilitate testing for Heartland and Bourbon viruses, which are emerging tickborne diseases in the United States and for tickborne diseases associated with international travel.

Action Items:

- (1) Local health departments and healthcare providers are encouraged to continue to educate people on the importance of tickborne disease prevention. Educational resources are available online at <https://nj.gov/health/cd/topics/vectorborne.shtml>.
- (2) Clinicians should review the epidemiological and clinical features and recommended tests for common and emerging tickborne diseases. Consider PCR testing where appropriate.
- (3) To request testing for Powassan, Heartland, or Bourbon viruses, healthcare providers should complete the NJDOH Arboviral Testing Request worksheet <https://nj.gov/health/cd/topics/vectorborne.shtml> and send via encrypted email to CDSVectorTeam@doh.nj.gov.
- (4) To request species-specific Spotted Fever Group Rickettsiosis testing in whole blood, eschar swab or rash biopsy specimens, healthcare providers should review the Laboratory Testing Guidance: Spotted Fever Group Rickettsiosis at <https://www.nj.gov/health/cd/topics/rocky.shtml>.

Contact Information:

- CDSVectorTeam@doh.nj.gov or (609) 826-5964 during business hours

References and Resources:

- Tickborne Diseases of the United States: A Reference Manual for Healthcare Providers, 2018: <https://www.cdc.gov/ticks/tickbornediseases/TickborneDiseases-P.pdf>
 - <https://www.nj.gov/health/cd/topics/vectorborne.shtml>
 - <https://www.cdc.gov/nceid/dvbd/index.html>
-

TICKBORNE DISEASE RECOMMENDATIONS DURING THE COVID-19 PANDEMIC

Tickborne diseases are a significant public health concern and are some of the most commonly reported communicable diseases in New Jersey. With warm weather quickly approaching and social distancing in effect, individuals may be spending more time outdoors than usual in or near tick habitats. While it is important that everyone takes steps to reduce their risk of infection with COVID-19, when outdoors, people still need to take steps to protect themselves and their family, as well as their pets from tick bites and tickborne diseases.

Local health departments and healthcare providers are encouraged to continue to educate people on the importance of tickborne disease prevention. With people spending more time at home, this may be a good time to modify the home landscape to reduce contact with ticks in the backyard. Resources for homeowners are available online at <https://nj.gov/health/cd/topics/vectorborne.shtml>. To prevent tickborne disease, residents can limit tick bites by using an EPA-registered insect repellent, wearing protective clothing, avoiding wooded areas with dense shrubs, checking skin, clothing, and pets for ticks frequently while outdoors and after coming inside, and by keeping shrubs and lawns trimmed.

If symptoms of tickborne illness develop after being outdoors in grassy or wooded areas, or after removing an attached tick, people should contact their healthcare provider. Symptoms vary by disease, but may include fever, headache, muscle aches, joint pain, and rash. Seeking medical care should not be delayed due to the COVID-19 pandemic. Depending on the practice, healthcare providers may provide care by telephone, through telemedicine, or with an in-person consult. Delays in medical care may lead to more severe infections. In some situations, a healthcare provider may recommend antibiotics as a preventive measure to reduce the risk of Lyme disease after a high-risk tick bite.

Understanding that laboratory testing for tickborne illnesses may be limited during the COVID-19 pandemic, NJDOH will continue to assist healthcare providers with testing for certain tickborne diseases (Powassan, Spotted Fever Group Rickettsiosis) that cause severe illness and adverse outcomes. NJDOH can also facilitate testing for Heartland and Bourbon viruses, which are emerging tickborne diseases in the United States and for tickborne diseases associated with international travel.

To request testing for Powassan, Heartland, or Bourbon viruses, healthcare providers should complete the NJDOH Arboviral Testing Request worksheet <https://nj.gov/health/cd/topics/vectorborne.shtml> and send via encrypted email to CDSVectorTeam@doh.nj.gov.

Powassan testing (and for mosquito-borne arboviruses) can be requested for patients who are hospitalized with neuroinvasive disease (e.g., encephalitis, meningitis, acute flaccid paralysis) of unknown etiology or for patients presenting with a febrile illness of unknown etiology if an arboviral disease is suspected.

Heartland and Bourbon virus testing can be requested for patients with an acute febrile illness occurring within the past 3 months, and one of the following: leukopenia (white blood cells <4,500 cells/ μ L), thrombocytopenia (platelets <150,000 cells/mL) not explained by another known condition, or a suspected tickborne disease with no response to appropriate treatment (e.g., doxycycline). The patient must also have compatible risk factors for infection: a known tick bite or tick exposure in the 3 weeks prior to illness onset or traveled to an area with previous transmission (Midwestern and Southern United States).

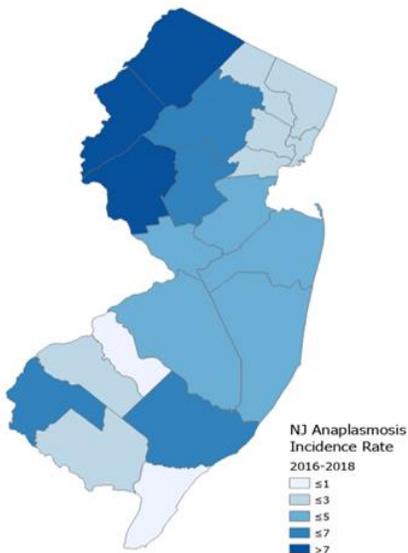
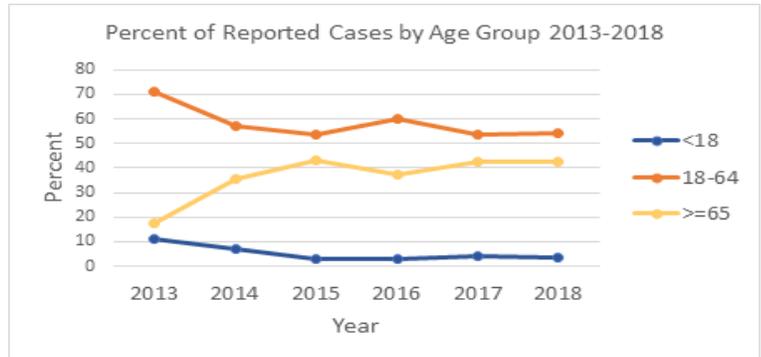
To request species-specific Spotted Fever Group Rickettsiosis testing in whole blood, eschar swab or rash biopsy specimens, healthcare providers should review the Laboratory Testing Guidance: Spotted Fever Group Rickettsiosis at <https://www.nj.gov/health/cd/topics/rocky.shtml>. Molecular testing can be provided on whole blood collected between days 3 and 8 of symptom onset or for persons with severe clinical presentations; and in rash biopsies and eschar swab specimens (eschars tend to be excellent specimens for detection). If patients meet the testing criteria, healthcare providers should complete the NJDOH Spotted Fever Group Rickettsiosis Testing Request Worksheet and send via encrypted email to CDSVectorTeam@doh.nj.gov.

Anaplasmosis is on the rise in New Jersey

Anaplasmosis is a tickborne disease transmitted by the deer tick, the same tick that transmits Lyme disease. Although less prevalent than Lyme, cases of anaplasmosis have been increasing in recent years, primarily in the Northeast region of the United States. To better understand the burden in New Jersey, an analysis was conducted using New Jersey's anaplasmosis surveillance data from the years 2009 – 2018.

The number of reported cases of anaplasmosis in New Jersey increased 69%, from 70 in 2009 to 118 in 2018. Most cases are between 18-64-years of age, but starting in 2013, cases have been increasing in persons 65 years and older. Anaplasmosis in children is rare, with less than 10 cases occurring each year.

The proportion of persons with anaplasmosis needing hospitalization increased from 12% in 2013 to 43% in 2018. Additionally, between 2016-2018 more cases were hospitalized for ≥ 7 days than in all prior years combined. Considering that increasing age is a factor of disease severity, 49% of cases aged 65 or older were hospitalized compared to 18% of cases aged 18-64.



The geographic distribution of anaplasmosis cases is varied, but with a predominance in the northwestern counties. The statewide average incidence rate for 2016-2018 was 4.4 cases per 100,000 population, compared with much higher rates in Sussex (40.4), Hunterdon (38.5), and Warren (33.1) counties.

When testing for *Anaplasma* infection, the most commonly reported positive tests are serology (66%), followed by PCR. Cross-reactivity between *Anaplasma* and *Ehrlichia* can make it difficult to accurately identify the cause of infection using only serology tests. In addition, antibody titers are often negative in the first week of illness and they have been shown to remain elevated in persons with no other indication of recent illness. To confirm infection using serology, acute and convalescent serology samples must be taken at least 2 weeks apart and show a 4-fold change in titer level. Only 1% of Anaplasmosis cases were

confirmed using serologic methods. PCR allows for direct detection of DNA, is the preferred method for detection during the acute phase of illness, and can distinguish between anaplasmosis and ehrlichiosis.

In summary, anaplasmosis is increasing in New Jersey, particularly in older age groups. Illness severity has also increased, with a larger proportion of cases needing hospitalization and longer lengths of stay. While anaplasmosis is reported across the state, northwestern counties have the highest incidence rates. Most reported cases have single serology test results, which are not confirmatory. The use of PCR tests has been increasing but should be considered as a more definitive test for acute anaplasmosis and ehrlichiosis.

EPIDEMIOLOGIC AND CLINICAL CHARACTERISTICS OF COMMON TICKBORNE INFECTIONS

	Lyme disease (Bacterial)	Babesiosis (Parasitic)	Anaplasmosis (Bacterial)	Ehrlichiosis (Bacterial)	Spotted Fever Group Rickettsiosis (Bacterial)
Main vector	Blacklegged tick	Blacklegged tick	Blacklegged tick	Lone star tick	American dog tick Lone star / Gulf coast tick
NJ incidence, 2018 (100,000)	44.9	2.8	1.3	1.1	1.7
Incubation Period	3-30 days	1–9+ weeks	1-2 weeks	1-2 weeks	2-12 days
Signs and Symptoms	EM rash, fatigue, fever, headache, mildly stiff neck, arthralgia, myalgia, lymphadenopathy	Fever, chills, sweats, headache, myalgia, arthralgia, malaise, fatigue, generalized weakness, dark urine, nausea, anorexia	Fever, headache, myalgia, malaise, nausea, vomiting, diarrhea and loss of appetite	Fever, severe headache, rash, myalgia, malaise, nausea, vomiting, diarrhea, loss of appetite, altered mental status	Fever, headache, malaise, myalgia, nausea, vomiting, anorexia, rash, eschar
Rash	Erythema migrans (EM) rash in 70 – 80% of patients	----	Rare	30% - More common in children than adults	Maculopapular / petechial rash in ~90% of Rocky Mountain Spotted Fever (RMSF) patients
Laboratory Findings & Complications	A-V block, facial palsy, cranial neuritis, lymphocytic meningitis/ encephalitis/ encephalomyelitis, multiple erythema migrans, arthritis, radiculoneuropathy	Thrombocytopenia, elevated creatinine, mildly elevated hepatic transaminases, hepatosplenomegaly, hemolytic anemia, disseminated intravascular coagulation, death (5% of untreated <i>B.microti</i> cases)	Anemia, leukopenia, thrombocytopenia, or elevated hepatic transaminases, difficulty breathing, hemorrhage, renal failure, neurological problems, death	Anemia, leukopenia, thrombocytopenia, elevated hepatic transaminases, difficulty breathing, meningoencephalitis, bleeding disorders, thrombocytopenia, leukopenia, LFT increases, death	Thrombocytopenia, leukopenia, mild LFT increases, hearing loss, amputation of extremities or limbs, paralysis, mental disability, death (30% in untreated cases)
Laboratory Tests	FDA-cleared two-tier tests Antibody & Immunoblot or 2- tier antibody test	Microscopy PCR in whole blood IgG antibody titer to <i>Babesia</i> <i>species</i> by IFA	PCR IgG antibody titer to <i>A.</i> <i>phagocytophilum</i> antigen by IFA (acute and convalescent specimens) Identification of morulae in the cytoplasm of monocytes or macrophages by microscopic examination	PCR IgG antibody titer to <i>E.</i> <i>chaffeensis</i> antigen by IFA (acute and convalescent specimens) Identification of morulae in the cytoplasm of monocytes or macrophages by microscopic examination	PCR in whole blood during first week of illness onset or in rash / eschar specimens IgG antibody testing by IFA (acute and convalescent specimens)
Additional Information	Antibiotic prophylaxis may be indicated following a high-risk tick bite. Serial testing is not recommended; no test of “cure”	Infections caused by <i>B.</i> <i>divergens</i> tend to be more severe (frequently fatal if not treated); combination treatment is recommended.	Delayed treatment (doxycycline) may result in severe illness or death.	Delayed treatment (doxycycline) may result in severe illness or death.	Early empiric treatment with doxycycline is recommended. Infections caused by <i>R. parkeri</i> , <i>R.</i> <i>species 364D</i> , or <i>R. akari</i> are less severe than RMSF.

EPIDEMIOLOGIC AND CLINICAL CHARACTERISTICS OF EMERGING TICKBORNE INFECTIONS

	<i>Borrelia miyamotoi</i> (Bacterial)	Tularemia (Bacterial)	Powassan (Viral)	Heartland (Viral)	Bourbon (Viral)
Main vector	Blacklegged tick	American dog tick Lone star tick	Blacklegged tick Woodchuck tick	Lone star tick	Lone star tick
Incubation Period	Days to weeks Specific range is unknown	1-21 days	1 – 4 weeks	Unknown Most patients report a tick bite 2 weeks prior to illness	Unknown Most patients report a tick bite 2 weeks prior to illness
Signs and Symptoms	Fever, chills, fatigue, severe headache, arthralgia, myalgia. Less common symptoms include dizziness, confusion, vertigo, rash, shortness of breath, nausea, abdominal pain, diarrhea, and lack of appetite	Clinical presentation varies, includes fever, headache, malaise, fatigue, myalgia, cough, chest pain, sore throat, conjunctivitis, vomiting, diarrhea, abdominal pain, lymphadenopathy, cutaneous ulcer	Initial symptoms: Fever, headache, vomiting, and generalized weakness	Fever, headache, fatigue, myalgia, arthralgia, decreased appetite, nausea, and diarrhea	Fever, fatigue, headache, myalgia, anorexia, nausea, vomiting, and maculopapular rash
Rash	Uncommon	--	--	--	Maculopapular rash
Laboratory Findings & Complications	Leukopenia, thrombocytopenia, elevated hepatic transaminase values	Varies based on route of transmission, may include thrombocytopenia, hyponatremia, elevated hepatic transaminases, elevated creatine phosphokinase, normal or elevated leukocyte/ sedimentation rate	Lymphocytic pleocytosis in CSF, meningoencephalitis, altered mental status, seizures, aphasia, paresis, movement disorders, or cranial nerve palsies 10% fatality rate	Leukopenia, thrombocytopenia, and mild to moderate elevation of hepatic transaminases	Thrombocytopenia and leukopenia Death
Laboratory Tests	PCR Serology (acute and convalescent)	Isolation of <i>F. tularensis</i> from a clinical specimen Detection by PCR or DFA Serology (acute and convalescent)	No routine testing available. Contact NJDOH for testing: IgM antibody	No routine testing available. Contact NJDOH for testing: PCR and IgM/IgG antibody.	No routine testing available. Contact NJDOH for testing.
Additional Information	Patients have been successfully treated with antibiotics/dosages used for Lyme disease	Infectious disease consult recommended for antibiotic treatment	Treatment is supportive	Treatment is supportive.	Treatment is supportive.