



Department of Health

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TO: Healthcare Providers, Hospitals, and Local Health Departments (LHDs)

**FROM: New York State Department of Health (NYSDOH)
Bureau of Communicable Disease Control (BCDC)**

HEALTH ADVISORY: TESTING AND REPORTING OF MOSQUITO- AND TICK-BORNE ILLNESSES

Please distribute to the Infection Control Department, Emergency Department, Infectious Disease Department, Obstetrics/Gynecology (including Nurse Practitioners and Midwives), Family Medicine, Travel Medicine Service, Pediatrics, Director of Nursing, Medical Director, Laboratory Service, Pharmacy, and all patient care areas.

NYSDOH is advising physicians on the procedures to test and report suspected cases of mosquito-borne illnesses, including West Nile virus (WNV), eastern equine encephalitis (EEE), dengue fever, chikungunya, Zika virus, and yellow fever virus as well as tick-borne illnesses including Lyme disease, babesiosis, anaplasmosis, ehrlichiosis, and Rocky Mountain spotted fever. Specific, detailed information about Zika virus will continue to be separately available at https://www.health.ny.gov/diseases/zika_virus/providers.htm.

SUMMARY

- Mosquito-borne (arboviral) illnesses:
 - During the mosquito season (early summer until late fall), health care providers should consider mosquito-borne infections in the differential diagnosis of any patient with clinical evidence of viral encephalitis or viral meningitis.
 - All cases of suspected viral encephalitis should be reported immediately to the LHD of the county where the patient resides.
 - Dengue, chikungunya, and/or Zika virus should be suspected year-round in patients presenting with fever, arthralgia, myalgia, rash, or other illness consistent with infection and recent travel to endemic areas¹.
 - Yellow fever should be considered in the differential diagnosis of any adult or pediatric patient with clinical evidence of fever, nausea, vomiting, epigastric pain, jaundice, renal insufficiency, and cardiovascular instability along with recent travel to Brazil or an area with risk of yellow fever virus transmission².
 - NYSDOH provides testing for many domestic and travel-associated viruses. The tests performed will depend on the clinical characteristics, patient status, travel history and availability of commercial testing.

- Tick-borne illnesses:
 - Tick-borne disease symptoms vary by type of infection and can include fever, fatigue, headache, and rash.
 - Clinicians are encouraged to review "Tickborne Diseases of the U.S.: A Reference Manual for Providers", published by the Centers for Disease Control

and Prevention (CDC) and available at <http://www.cdc.gov/lyme/resources/TickborneDiseases.pdf>. The manual contains information on tick identification, tick-borne disease symptoms, laboratory testing, and recommended treatment.

- While Lyme disease continues to be the most prevalent tick-borne disease in New York State (NYS), other tick-borne diseases including babesiosis and anaplasmosis, are spreading geographically within the State.
- Clinicians are reminded to use NYS-permitted commercial laboratories for routine tick-borne disease testing. Public health testing is available for more complex cases; however, specimens should not be sent to NYSDOH without first consulting the LHD of the patient's county of residence or BCDC.
- Providers should report cases of tick-borne and mosquito-borne diseases to the LHD of the patient's county of residence as soon as possible after diagnosis.

BACKGROUND

Domestic mosquito-borne diseases, such as EEE and WNV, continue to occur annually in NYS. EEE is regarded as one of the most serious mosquito-borne diseases in the United States because of its high mortality rate. Although there were no human cases of EEE in NYS in 2017, there have been cases in prior years, including three cases in 2015; many have been fatal. WNV continues to be detected across NYS, occasionally resulting in human fatalities. In partnership with LHDs, NYSDOH continues to conduct surveillance activities for EEE and WNV; a critical component of these efforts is the rapid detection and timely reporting of potential cases by medical providers.

In NYS, dengue, chikungunya, and Zika virus infections are associated with travel to endemic areas however, there is the potential for local transmission of these viruses if *Aedes albopictus* (Asian tiger) mosquitoes feed on infected persons during their viremic period after being infected in and returning from an endemic area.

The CDC has issued a Level 2 Travel Alert because of an ongoing yellow fever outbreak in Brazil. The first cases were reported in the State of Minas Gerais in December 2016, but confirmed cases have since been reported in the neighboring states of Espirito Santo, São Paulo, a number of cities in Bahia State, and Rio de Janeiro (including Rio de Janeiro City and all coastal islands). In response, Brazilian health authorities have recently expanded the list of areas in which yellow fever vaccination is recommended and are recommending enhanced precautions when traveling to Brazil. Information about yellow fever vaccination can be found below. Additional information is available at <https://wwwnc.cdc.gov/travel/notices/alert/yellow-fever-brazil>.

Lyme disease continues to be the most prevalent tick-borne disease in NYS with over 130,000 estimated cases since 1986. The tick that carries the bacteria that causes Lyme disease (black-legged/deer tick) can also carry pathogens that cause babesiosis and anaplasmosis. Disease surveillance trends for both of these diseases show an expanding geographic range beyond the Hudson River valley to areas further north and west than has been seen in previous years. The seasonal pattern seen in Lyme disease is also true of ehrlichiosis which is transmitted by the Lone Star tick. Rocky Mountain spotted fever (RMSF), transmitted by the American dog tick, is more rare than other tick-borne diseases, however, cases continue to be reported across NYS annually. Powassan encephalitis, a tick-borne viral illness that can cause encephalitis or meningitis, is reported each year in NYS as well, although case numbers are very low, generally 1-5 cases per year.

REPORTING CASES OF ARBOVIRAL AND TICK-BORNE ILLNESS

Under NYS Public Health Law 2012 and 10NYCRR 2.10, health care providers must ***immediately report*** by telephone any patient with suspected viral encephalitis. The report should be made to the LHD of the patient's county of residence. Viral meningitis is also reportable under public health law but immediate notification is not required.

Other suspected presentations of arboviral infection, including those associated with dengue chikungunya, Zika virus, and yellow fever are also reportable. Prompt reporting of suspected cases with no travel history is particularly important as these may indicate local transmission and the need for public health intervention.

Provider reporting requirements also apply to patients who are diagnosed and treated based solely or in part on clinical presentation and history.

SPECIMEN COLLECTION AND REFERRAL FOR TESTING

The NYSDOH's Wadsworth Center laboratories offers testing for domestic mosquito-borne viruses, including WNV and EEE. Cerebrospinal fluid (CSF) and serum testing by polymerase chain reaction (PCR) is more sensitive early in infection, while serology testing (for antibody) will better detect cases that are beyond the viremic phase. Therefore, ideally, both CSF and acute/convalescent serum specimens should be submitted for testing when neuroinvasive disease is suspected. Otherwise, acute and convalescent serum specimens can be used for diagnosis. Convalescent specimens should be drawn at least 3 weeks after acute specimens. Instructions on the collection and submission of clinical specimens and a detailed algorithm about which tests will be conducted on submitted specimens, and the Viral Encephalitis/Meningitis Case Report and History Forms can be found at <http://www.wadsworth.org/programs/id/virology/services/arbovirus-testing>.

Testing for dengue (PCR and serology), chikungunya (PCR and serology), and Zika virus (PCR and serology) is available through a number of NYS-permitted commercial laboratories and the Wadsworth Center. Specimens should not be sent to the Wadsworth Center for Zika virus testing without first consulting the LHD of the patient's county of residence or BCDC. Additional information on dengue and chikungunya testing can be obtained by calling your LHD. Information on Zika virus testing can be found at http://www.health.ny.gov/diseases/zika_virus/providers.htm

Testing for yellow fever is available through Wadsworth Center and a limited number of specialized laboratories nationally. Specimens should not be sent to the Wadsworth Center for yellow fever testing without first consulting the LHD of the patient's county of residence or BCDC.

In consultation with LHDs or BCDC, public health testing is available for non-routine or specialized tick-borne disease testing. Depending upon the disease, testing may involve whole blood smear examination, PCR, or serologic testing. Confirmation of cases of tick-borne disease via collection of both acute and convalescent serum specimens is necessary unless the virus has been detected with a specific PCR assay. Further information on accessing public health testing for tick-borne disease can be obtained by calling your LHD or BCDC.

Providers are reminded to utilize NYS-permitted commercial laboratories for routine testing of patients with suspected Lyme disease. A two-tier testing protocol is recommended by CDC and NYSDOH for Lyme disease; an EIA or IFA should be performed first, followed by a Western blot if the EIA or IFA is positive or equivocal. It is important to note that serologic tests for Lyme

disease are insensitive during the first few weeks of infection. Collection of convalescent sera may be required for serologic diagnosis. During the early stage, patients with an erythema migrans rash may be diagnosed clinically.

YELLOW FEVER VACCINATION

Yellow fever vaccine is recommended for anyone nine months or older who travels to high-risk areas. Yellow fever vaccine may be required for entry into certain countries. Because of the current outbreak, CDC is currently recommending yellow fever vaccine for travelers to certain areas of Brazil, including popular tourist destinations such as Ilha Grande and the cities of Rio de Janeiro and São Paulo (<https://wwwnc.cdc.gov/travel/page/yellow-fever-information>). People who have not been vaccinated should avoid traveling to areas of Brazil where yellow fever vaccination is recommended. For most travelers, one dose of yellow fever vaccine provides long-lasting protection. However, parts of Brazil are currently higher risk because of the outbreak. Travelers may consider getting a booster dose of yellow fever vaccine if traveling to areas with yellow fever outbreaks and it's been 10 or more years since they were vaccinated.

Yellow fever vaccine is currently available at only a limited number of clinics in the United States. Travelers should contact a yellow fever vaccine provider well in advance of travel. A list of these providers can be found at <https://wwwnc.cdc.gov/travel/yellow-fever-vaccination-clinics/search>.

Additional detailed information on yellow fever vaccination can be found at: <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever>

ADDITIONAL INFORMATION

Additional information on mosquito and tick-borne diseases can be found at:

http://www.health.ny.gov/diseases/west_nile_virus/
http://www.health.ny.gov/diseases/communicable/arboviral/fact_sheet.htm
<http://www.health.ny.gov/diseases/communicable/lyme/index.htm>
http://www.health.ny.gov/diseases/zika_virus/
<http://www.cdc.gov/Dengue/>
<http://www.cdc.gov/chikungunya/>
<http://www.cdc.gov/zika/>
<https://wwwnc.cdc.gov/travel/diseases/yellow-fever>

If you have any questions regarding this information, please contact your LHD or the NYSDOH Bureau of Communicable Disease Control at (518) 473-4439 or via email at bcdc@health.ny.gov. Contact information for LHDs is available at <http://www.nyscho.org/i4a/pages/index.cfm?pageid=3713>.

¹ A map of the current geographic distribution of dengue can be found at: <http://www.healthmap.org/dengue/en/>

A map of the current geographic distribution of chikungunya can be found at: <http://www.cdc.gov/chikungunya/>

A map of the current geographic distribution of Zika virus can be found at: <http://www.cdc.gov/zika/>

² A map of the current geographic distribution of yellow fever can be found at: <https://www.cdc.gov/yellowfever/maps/index.html>