NEW YORK STATE | 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.

The New York State Department of Health (NYSDOH) is reminding healthcare providers of the procedures for testing and reporting of mosquito- and tick-borne illnesses.

Providers are reminded to ask patients about outdoor activities as part of routine telehealth, outpatient, and inpatient assessments. Prompt recognition of and treatment for tick-borne diseases is crucial to minimizing morbidity and mortality.

Health care provider recognition of mosquito-borne illnesses is also a key component of mosquito-borne disease surveillance activities and can assist public health authorities with appropriate implementation of interventions, including mosquito control activities.

NYSDOH is therefore advising physicians on the procedures to test for 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, Rocky Mountain spotted fever, and Powassan virus.

SUMMARY

- Mosquito-borne (arboviral) illnesses:
  - During the mosquito season (early summer until late fall), healthcare 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 local health department (LHD) of the county where the patient resides.
  - Dengue, chikungunya, Oropouche, 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 areas[1].

[1] https://wwwnc.cdc.gov/travel/destinations/list

- Puerto Rico and the U.S. Virgin Islands (USVI) continue to experience an ongoing outbreaks of dengue fever. Case numbers have been near or above epidemic levels in Puerto Rico and USVI since early 2024. An increase in new cases is anticipated as we move into the summer season, when dengue cases typically peak. A commensurate increase in travel-associated cases could be expected for New York State residents traveling to and from the Caribbean and Central and South American region.
- 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 Africa, South America, or any other area with risk of yellow fever virus transmission[2].
- While malaria transmission primarily occurs as a result of international travel, in 2023, multiple U.S. states (FL, MD, TX, and AR) reported local transmission of malaria. Providers are reminded to consider malaria in febrile patients with a history of travel to areas where malaria is transmitted.
- 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.
  - 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. Prompt recognition of and treatment for these diseases is crucial to minimizing morbidity and mortality.
  - For patients who present with an EM rash after being in an area where Lyme disease is common, Lyme disease should be diagnosed clinically (without diagnostic testing), as serologic tests may be negative during the first few weeks of infection before antibodies have developed
  - Clinicians are reminded to use NYS-permitted commercial laboratories for routine tick-borne disease testing. Public health testing is available for more complex cases where symptoms suggest infections with viral illnesses such as Powassan, Heartland, or Bourbon; however, specimens should not be sent to NYSDOH without first consulting the LHD of the patient's county of residence or the NYSDOH Bureau of Communicable Disease Control (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. In 2024, there was an unprecedented level of EEE activity across the state with two human cases, 22 equine cases, two ratite (emu) cases, and EEEV+ mosquitoes reported in 17 counties[3]. WNV continues to be detected across NYS each year,

[2] https://www.cdc.gov/yellow-fever/index.html
[3] https://www.health.ny.gov/diseases/mosquitoes/reports/2024/docs/summary_report.pdf

occasionally resulting in human fatalities. Recently, Jamestown Canyon, and Cache Valley viruses have been implicated in serious human infections. A critical component of mosquito-borne disease surveillance activities 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; 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. Recently, an increased number of cases of dengue fever have been reported in many parts of the world including Central and South America, Mexico, the Caribbean, Africa, the Middle East, Asia, and the Pacific Islands. Dengue 2 and 3 are the predominant serotypes currently causing disease in the Caribbean and Central and South America, while immunity to serotype 1 is perceived to be high among human populations in the area. In NYS in 2024, 333 cases of dengue were reported in people who traveled from areas with ongoing dengue transmission, the highest number ever recorded in one year. With travel between New York State, Puerto Rico, and other destinations in the afflicted region, the NYSDOH urges providers to consider evaluation for dengue in patients presenting with consistent symptoms and relevant travel history. Patients returning from an area with risk of dengue should be counseled to take steps to avoid mosquito bites for 3 weeks following their return, even if they do not feel ill, so they do not spread the virus to mosquitoes that could then infect others.

Clinicians should also consider Oropouche virus infection among travelers returning from impacted areas in the Americas Region in the differential diagnosis of individuals with sudden onset of fever, severe headache, chills, muscle aches, and joint pain.[4] Symptoms typically last less than a week (2–7 days) but can often reoccur a few days or even weeks later. Oropouche virus can be passed from a pregnant person to the fetus. Though research is ongoing, infection during pregnancy has been associated with poor pregnancy outcomes such as stillbirth and birth defects. Pregnant travelers should reconsider non-essential travel to areas with a Level 2 Travel Health Notice for Oropouche[5].

Travelers are reminded to visit the CDC Travel Notice page prior to travel as the page informs travelers and clinicians about current health issues that impact travelers' health, like disease outbreaks, special events or gatherings, and natural disasters in destinations around the world. Currently, the CDC has issued a Level 2 Travel Alert for Nigeria due to an ongoing outbreak of yellow fever, Réunion due to an outbreak of chikungunya, and parts of Brazil and Panama due to outbreaks of Oropouche. Additional information is available at https://wwwnc.cdc.gov/travel/notices.

Lyme disease continues to be the most prevalent tick-borne disease in NYS with over 150,000 cases estimated 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. Surveillance trends for both of these diseases show an expanding geographic range beyond the Hudson River valley to areas further north in the Capital District and west in the Central and Western regions than has been seen in previous years; case numbers are steadily increasing as well. 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

[4] https://www.paho.org/en/topics/oropouche-virus-disease
[5] https://wwwnc.cdc.gov/travel/notices

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 (<10 cases per year).

Although most often associated with residence in or travel to the Midwest and Southern United States, a single case of Heartland virus has been reported in NYS, and Bourbon virus has been isolated from ticks in Suffolk County. Both viruses are transmitted by the bite of an infected Lone Star tick. Clinical symptoms of Heartland and Bourbon virus disease are very similar to those of ehrlichiosis and include fever, fatigue, anorexia, nausea, and diarrhea. Cases have also had leukopenia, thrombocytopenia, and mild to moderate elevation of liver transaminases. Heartland and Bourbon virus disease should be considered in patients being treated for ehrlichiosis who do not readily respond to treatment with doxycycline.

A recent introduction to NYS, the Asian longhorned tick (*Haemaphsalis longicornis*), continues to be identified in parts of the Hudson River Valley, New York City, and Long Island. Bites from these ticks have been known to cause human illness in other countries. With ongoing testing of ticks collected in the United States, it is likely some ticks will be found to contain pathogens that can be harmful to people; however, we do not know yet if these ticks are able to pass these pathogens along to people and make them ill.

REPORTING CASES OF ARBOVIRAL AND TICK-BORNE ILLNESS

Under NYS Public Health Law 2102 and 10 NYCRR 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, Oropouche, 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.

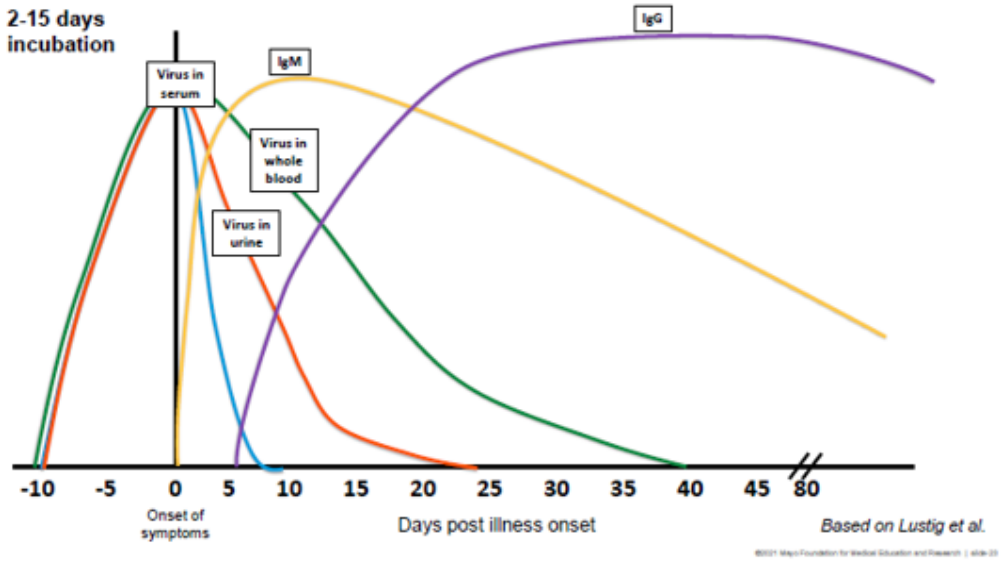
SPECIMEN COLLECTION AND REFERRAL FOR TESTING

The NYSDOH's Wadsworth Center laboratories offer testing for domestic mosquito-borne viruses, including WNV, EEE, and St. Louis Encephalitis (SLE) as well as tick-borne viruses including Powassan, Heartland, and Bourbon. 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 can be found at http://www.wadsworth.org/programs/id/virology/services/arbovirus-testing.

The Wadsworth Center is requesting that in addition to serum (and CSF if there is neurologic involvement), urine and whole blood should also be sent to improve the opportunity for detection and identification of suspected arboviral infections if submitting samples to Wadsworth for testing. WNV and Zika virus reach higher titers and are present longer in urine and whole blood than in CSF (Figure 1). Published studies have shown that molecular detection is improved by

the inclusion of these additional specimen types for flavivirus testing. Although there is very little data available for other arboviruses, the Wadsworth Center will test the entire panel of arboviruses in these four specimen types to see where improved detection rates are achieved.

Figure 1. Timing of West Nile virus molecular detection in serum, urine, and whole blood; and antibody detection in serum. Note the extended timeframe for virus detection in urine and whole blood over serum.



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. Testing for yellow fever is available through Wadsworth Center and a limited number of specialized laboratories nationally. Testing for Oropouche is available through Wadsworth Center and CDC.

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.

- Required specimen volumes, storage, and shipping for virologic testing:
  - CSF: > 1.5 mL requested for PCR and serology, minimum 300 µL for PCR only, stored frozen and shipped on dry ice, minimum 300 µL for serology only
  - Serum: SST spun and aliquoted, > 2.5 mL requested for PCR and serology, minimum 1000 µL for PCR only, minimum 500 µL for serology only
  - Urine: > 2.5 mL requested for PCR only, minimum 1000 µL
  - Whole blood: > 0.5 mL requested for PCR only, minimum 200 µL

- Serum, urine, and whole blood should be stored cold and shipped on cold packs but may be shipped frozen on dry ice with or without CSF.

Information about Online Test Requests for testing at the Wadsworth Center, supporting information, and Report Access can be found here: https://www.wadsworth.org/electronic-test-request-reporting-new .

In all cases where clinicians are seeking testing through Wadsworth Center, it is imperative that specimens be sent to Wadsworth Center only after consultation with the LHD of the patient's county of residence or BCDC.

Providers are reminded to use NYS-permitted commercial laboratories for routine testing of patients with suspected Lyme disease and other routine tick-borne diseases such as anaplasmosis, ehrlichiosis, babesiosis, and Rocky Mountain spotted fever. For Lyme disease, a two-tier testing protocol is recommended by CDC and NYSDOH. 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.

VACCINATION

Yellow Fever: Yellow fever vaccine is recommended for people who are 9 months old or older and who are traveling to or living in areas at risk for yellow fever virus in Africa and South America. For most people, a single dose of yellow fever vaccine provides long-lasting protection and a booster dose of the vaccine is not needed. However, travelers going to areas with ongoing outbreaks may consider getting a booster dose of yellow fever vaccine if it has been 10 years or more since they were last vaccinated. Certain countries might also require a booster dose of the vaccine; clinicians can visit CDC's Travelers' Health page for information on specific country requirements: https://wwwnc.cdc.gov/travel/yellowbook/2024/preparing/yellow-fever-vaccine-malaria-prevention-by-country. A map of clinics with yellow fever vaccine 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: Yellow Fever | CDC Yellow Book 2024.

Chikungunya: In November 2023, the U.S. Food and Drug Administration approved a chikungunya vaccine, IXCHIQ for adults aged 18 years and older. In February 2024, the U.S. Advisory Committee on Immunization Practices approved recommendations for use of the vaccine among certain people who travel abroad and for laboratory workers in the United States. The groups for whom vaccination is recommended and may be considered can be found at: https://www.cdc.gov/chikungunya/hcp/vaccine/index.html.

ADDITIONAL INFORMATION

Additional information on mosquito- and tick-borne diseases can be found at:
https://www.health.ny.gov/diseases/mosquitoes/
http://www.health.ny.gov/diseases/communicable/lyme/index.htm
http://www.cdc.gov/Dengue/
http://www.cdc.gov/chikungunya/
http://www.cdc.gov/zika/
https://www.cdc.gov/oropouche/index.html
https://www.cdc.gov/yellow-fever/index.html

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 Contact Your County Health Office - NYSACHO