



**2021 Health Alert #16:  
West Nile Virus: Increasing Positive Mosquito Pools and  
Human Cases Under Investigation in New York City**

**July 22, 2021**

*Please distribute to staff in the Departments of Internal Medicine, Pediatrics, Family Medicine, Neurology, Infection Control, Infectious Disease, Emergency Medicine, Critical Care, Obstetrics and Gynecology, Oncology and Laboratory Medicine*

- **West Nile virus (WNV) has been detected in mosquitoes collected from all five boroughs of New York City (NYC); one possible human case is under investigation.**
- **Mosquito activity in NYC usually peaks around July 20.**
- **WNV disease should be suspected in patients presenting with viral meningitis or encephalitis, acute flaccid paralysis, and/or symptoms compatible with West Nile fever, particularly now through October 31.**
  - **The most sensitive screening test for WNV in humans is IgM enzyme immunoassay on cerebrospinal fluid and/or serum. Testing is widely available at commercial laboratories.**
  - **PCR testing, while confirmatory, is less sensitive. However, it may be the best option for patients who are severely immunosuppressed and unable to mount a detectable immune response.**
- **Advise patients, especially adults 50 years and older or persons with weakened immune systems, to protect themselves from mosquito bites.**
- **Report all cases of encephalitis or any laboratory evidence of current or recent infection with WNV or any other arboviral infection to the New York City Health Department.**

Dear Colleagues,

West Nile virus (WNV) has been detected in mosquitoes from all five borough of New York City (NYC). The first WNV positive mosquito pool this year was detected earlier than last year (6/14/2021 compared to 7/7/2020). To date in 2021, there have been a total of 188 positive mosquito pools (Bronx=23, Brooklyn=11, Manhattan=1, Queens=86 and Staten Island=67), compared to 9 positive pools at the same time last season (2020). You can find real time surveillance data to monitor WNV activity in NYC at <http://www1.nyc.gov/site/doh/health/health-topics/west-nile-virus-activity.page>. Mosquito populations were rising significantly following recent heavy rains with an average of 185 mosquitoes caught in each trap per day, compared to 2020, with 66 mosquitos per trap/day for the same period. The NYC Health Department has begun widespread larviciding, focused adulticiding and enhanced mosquito surveillance activities.

A possible human case of WNV in a Bronx resident recently discharged following a diagnosis of meningitis is currently under investigation by the NYC Health Department. Across the United States, a total of 11 cases of WNV disease have been reported this year. For a historical summary of human cases in NYC, see [here](#).

## West Nile Virus Surveillance and Reporting

The Health Department reminds medical providers to be alert for possible cases of WNV disease now through October 31, 2021, the peak adult mosquito season. **Consider WNV** in any patient with unexplained **encephalitis** (which may manifest as fever, altered mental status, seizures, focal neurologic deficits, or movement disorders such as tremor or parkinsonism), **viral meningitis** (WNV meningitis is clinically indistinguishable from viral meningitis due to other etiologies and typically presents with fever, headache, and nuchal rigidity), **acute flaccid paralysis**, as well as in patients with symptoms compatible with **West Nile fever**, which can include fever, maculopapular rash, headache, fatigue, weakness, joint and muscle pain, as well as nausea, vomiting and diarrhea.

Most patients with WN fever or WNV meningitis recover completely, but fatigue, malaise, and weakness can linger for weeks or months. Patients who recover from WNV encephalitis often have residual neurologic deficits. Among patients with neuroinvasive disease, the overall case-fatality ratio is approximately 10%, but it is significantly higher for patients with WNV encephalitis than WNV meningitis.

## Laboratory Testing

Specimens for serologic testing for WNV should be sent to a commercial laboratory or your hospital laboratory, if available. **The most sensitive screening test for WNV in humans is IgM enzyme immunoassay (EIA) on cerebrospinal fluid (CSF) and/or serum.** WNV-specific IgM antibodies are usually detectable within 8 days of symptom onset and persist for 30 to 90 days or longer. WNV IgG antibodies persist for many years following a symptomatic or asymptomatic infection. Therefore, the presence of IgG antibodies alone is only evidence of previous infection and patients should be evaluated for other etiologic agents. **Viral RNA testing using polymerase chain reaction (PCR) can be done on CSF and serum but it is less sensitive than the immunoassay.** A positive PCR result confirms infection, but a negative result does not rule it out. *As such, always attempt to submit serum for serology when submitting a CSF specimen for PCR.* PCR testing on CSF, or serum or plasma may be useful for **severely immunocompromised** patients and possibly the only way to diagnose WNV infection in individuals who are unable to mount a detectable humoral immune response. Immunohistochemical (IHC) staining is also offered by the Centers for Disease Control and Prevention if brain tissue is available for testing. Health care providers wishing to submit CSF from patients with encephalitis to the New York State Wadsworth Center for the viral encephalitis PCR panel must adhere to the submission guidelines, which are available online (links listed below). In special cases, the NYC Health Department can assist with testing or transporting specimens to Wadsworth, e.g., cases potentially due to an unusual source of transmission, such as transfusion, transplant or laboratory exposure.

Updated “Guidelines for West Nile Virus Testing and Reporting Cases of Encephalitis and Viral Meningitis, West Nile and other Arboviral Infections” are available online at:

<http://www1.nyc.gov/assets/doh/downloads/pdf/wnv/wnv-testing-instructions.pdf>. This document includes a list of commercial laboratories that provide West Nile virus serologic testing, PCR or virus isolation, and links to the Wadsworth Center guidance for submitting CSF and serum for the PCR Viral Encephalitis\* and Arboviral Serology\* panels.

## Viral Encephalitis PCR Panel and Arboviral Serology Screening\* at Wadsworth Center’s Viral Encephalitis Laboratory (VEL)

Instructions, forms, and information for submitting specimens to the Wadsworth Center VEL for viral encephalitis PCR testing can be found at

<http://www.wadsworth.org/programs/id/virology/services/encephalitis>.

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## Zika, Dengue and Chikungunya

Zika, dengue, and chikungunya are three other types of arboviruses occasionally diagnosed among NYC residents. These viruses are associated with travel to an endemic area or, for Zika virus, unprotected sex with a person who has traveled to an endemic area. They rarely are associated with encephalitis, and more often result in illness similar to WN fever in which patients present with fever and rash. For information on recognizing, diagnosing, and reporting these diseases, visit our website at [nyc.gov/health](http://nyc.gov/health) and search by disease, or click on the following links:

- Zika information for providers: <https://www1.nyc.gov/site/doh/providers/reporting-and-services/zika.page>
- Dengue testing and reporting guidelines: <https://www1.nyc.gov/assets/doh/downloads/pdf/cd/dengue-testing-and-reporting-guidance.pdf>
- Chikungunya testing and reporting guidelines: <https://www1.nyc.gov/assets/doh/downloads/pdf/cd/chikungunya-testing.pdf>

## Reporting to the Health Department:

Encephalitis should be reported routinely throughout the year, as required by the NYC Health Code. Arboviral infections, including WNV, with laboratory evidence of recent or current infection should be reported immediately, as required by the NYC Health Code. For consultation or to report a case of WNV or other arboviral infections to the NYC Health Department:

- Call the Provider Access Line at 866-692-3641 OR
- Fax the completed Universal Reporting Form to 347-396-2632 OR
- Complete the electronic Universal Reporting Form at: <http://www1.nyc.gov/site/doh/providers/reporting-and-services/reporting-central.page>.

The successful detection and control of WNV in NYC has been due in large part to our Health Department's ongoing excellent partnership with the city's medical and laboratory communities. Thank you for your continuing efforts.

Sincerely,

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\* The PCR Summer Viral Encephalitis Panel includes: *arboviruses (West Nile, Powassan virus St. Louis encephalitis, Eastern equine encephalitis, California serogroup (including La Crosse, Jamestown Canyon, and Cache Valley viruses), adenovirus, cytomegalovirus, Epstein-Barr virus, enterovirus (all serotypes including echovirus and Coxsackie virus, poliovirus and others), herpes simplex viruses 1 and 2, human herpes virus 6, and varicella zoster virus.* The Arboviral Serology Screen includes: *West Nile, Powassan, Eastern equine encephalitis, Western equine encephalitis, St. Louis encephalitis, California serogroup encephalitis.* Testing for *chikungunya* and *Zika* viruses is only available upon request and in consultation with the health department.