



## 2023 Health Advisory #16: West Nile Virus: Positive Mosquito Pools in New York City

- West Nile virus (WNV) has been detected in 201 pools of mosquitoes collected from all New York City (NYC) boroughs except Manhattan. At this time human cases have not yet been detected in NYC.
- Advise adults ages 60 years and older and persons with weakened immune systems, to protect themselves from mosquito bites. This is especially true for patients on rituximab and other B-cell depleting therapies (e.g., patients with certain autoimmune, onco-hematologic, and/or neurologic disorders) as they can have a severe or prolonged course of illness<sup>1</sup>.
- WNV infected mosquitoes are typically present in NYC from July through October, with peak activity during August and September.
- WNV disease should be suspected in anyone presenting with viral meningitis or encephalitis, acute flaccid paralysis, or symptoms compatible with West Nile fever, particularly now through October 31.
  - The most sensitive diagnostic test for WNV is IgM enzyme immunoassay (EIA) on cerebrospinal fluid (CSF) or serum. Reverse transcriptase polymerase chain reaction (RT-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. IgM EIA testing on serum and CSF should always be done concurrently with RT-PCR.
- Report all cases of encephalitis or any laboratory evidence of current or recent infection with WNV or any other arboviral infection to the NYC Health Department.

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August 2, 2023

Dear Colleagues,

West Nile virus (WNV) has been detected in mosquitoes across New York City (NYC); a total of 201 positive mosquito pools (a pool is a group of up to 50 mosquitoes combined for WNV testing) have been reported from the Bronx (10), Brooklyn (6), Queens (66) and Staten Island (119). Last year (2022) at this time NYC had identified 241 WNV positive pools. At this time human cases have not yet been detected in NYC. Real time surveillance data on WNV activity in NYC is available [here](#). Information on the NYC Health Department's mosquito control activities are posted [here](#).

### West Nile Virus Surveillance and Reporting

Medical providers should be alert for possible cases of WNV disease now through October 31, the adult mosquito season. An estimated 70-80% of human WNV infections are subclinical or asymptomatic. Most symptomatic persons experience an acute systemic febrile illness referred to as West Nile fever (WNF) that often includes headache, weakness, myalgia, or arthralgia;

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<sup>1</sup> Kapadia, R. K., Staples, J. E., Gill, C. A., Fischer, M., Khan, E., Laven, J., Panella, A. J., Velez, J. O., Hughes, H. R., Brault, A. C., Pastula, D. M., & Gould, C. V. (2022). Severe arboviral neuroinvasive Disease in Patients on rituximab therapy: a review. *Clinical Infectious Diseases*, 76(6), 1142–1148. <https://doi.org/10.1093/cid/ciac766>

gastrointestinal symptoms; and a transient maculopapular rash also are commonly reported. Less than 1% of infected persons develop West Nile virus neuroinvasive disease (WNND), which typically manifests as meningitis, encephalitis, or acute flaccid paralysis. People over 60 years of age or with certain medical conditions or treatments that cause immunosuppression such as cancer, diabetes, and organ transplantation, are at greater risk of WNND. This is especially true for patients on rituximab and other B-cell depleting (e.g., patients with certain autoimmune, onco-hematologic, and/or neurologic disorders). Consider WNV disease in patients with compatible symptoms, especially those with unexplained encephalitis, viral meningitis, or acute flaccid paralysis.

Mosquitoes that carry West Nile virus are active and bite around dusk and dawn. Advise people to stay indoors at this time, and if they go outside take [measures to avoid being bitten](#) including the use of an [EPA approved insect repellent](#). They could also take steps to [reduce mosquitoes in and around their residence](#).

In 2022, a record number of 36 people were diagnosed with WNND. Last year was also a record high year for WNV detections in mosquitoes with 1,555 positive pools. The number of mosquitoes and the number of WNV positive mosquito pools in NYC has been increasing over time and is likely associated with the changing precipitation and increasing temperatures. Climate factors including precipitation and temperature contribute to increased mosquito reproduction rates and the amplification of WNV in mosquitoes which can influence the distribution, abundance, and prevalence of WNV in mosquitoes.

Over the past 10 years, most people diagnosed with WNV have occurred in Queens (87), followed by Brooklyn (67), Staten Island (31), Manhattan (26), and the Bronx (13). An average of 17 people were diagnosed with WNND (range 6-36). The median age was 62 years (range 22-95 years) and the case fatality rate was 10%. Most patients with WNV fever disease or WNV meningitis recover completely, but fatigue, malaise, and weakness can linger for weeks or months. Patients with WNV encephalitis or poliomyelitis often have residual neurologic deficits.

### Laboratory Testing

Guidelines for West Nile Virus Testing and other Arboviral Infections are available [here](#). This document includes a list of commercial laboratories that provide WNV serologic testing and RT-PCR, and links to the Wadsworth Center guidance for submitting CSF and serum for the RT-PCR Viral Encephalitis Panel<sup>2</sup> and Arboviral Immunology<sup>3</sup> Screen.

The most sensitive test for WNV in humans is the IgM EIA on CSF and serum. WNV-specific IgM antibodies are usually detectable within 8 days of symptom onset. A positive IgG EIA result with a negative IgM is likely indicative of a past infection with West Nile virus or possibly another flavivirus (e.g., dengue virus or Zika virus). Viral RNA testing on CSF and serum using RT-PCR is less sensitive than the IgM EIA but can aid in the diagnosis of those who are severely immunocompromised and unable to mount a detectable humoral immune response. A positive RT-PCR result confirms infection, but a negative result does not rule it out. As such, always submit serum (and CSF if collected) for the EIA IgM immunoassay when submitting specimens for RT-PCR.

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<sup>2</sup> [The PCR Summer Viral Encephalitis Panel](#) includes: *arboviruses (West Nile, Powassan, St. Louis encephalitis, Eastern equine encephalitis, California serogroup [including La Crosse and Jamestown Canyon], Cache Valley, and Heartland viruses), adenovirus, cytomegalovirus, Epstein-Barr virus, enterovirus (all serotypes including echovirus, Coxsackie virus, poliovirus and others), herpes simplex viruses 1 and 2, human herpes virus 6, and varicella zoster virus*

<sup>3</sup> [The Arboviral Serology Screen](#) includes: *West Nile, Powassan, Eastern equine encephalitis, Western equine encephalitis, St. Louis encephalitis, and California serogroup encephalitis*. Testing for *chikungunya* and *Zika* viruses is only available upon request and in consultation with the health department.

Health care providers wishing to submit CSF from patients hospitalized with encephalitis to the New York State Wadsworth Center for the viral encephalitis RT-PCR panel must adhere to the [submission guidelines](#) and submit both serum and CSF. Instructions, forms, and information for submitting specimens to the Wadsworth Center DIL for Arboviral Serology can be found [here](#). Providers are also encouraged, but not required, to submit urine and whole blood samples to help Wadsworth Center improve the opportunity for detection and identification of suspected arboviral infections. In special cases, (e.g., cases potentially due to an unusual source of transmission, such as transfusion, transplant, or laboratory exposure), the NYC Health Department can assist with testing or transporting specimens to Wadsworth or the Centers for Disease Control and Prevention for immunohistochemical (IHC) staining if brain tissue is available for testing.

### **Reporting to the Health Department**

Encephalitis should be reported routinely throughout the year, as required by the NYC Health Code. Arboviral infections, including West Nile virus, with laboratory evidence of recent or current infection should be reported immediately. 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. Telephone reports will need to be followed by a written report:

- Complete the electronic Universal Reporting Form at [www1.nyc.gov/site/doh/providers/reporting-and-services/reporting-central.page](http://www1.nyc.gov/site/doh/providers/reporting-and-services/reporting-central.page); or
- Fax the completed Universal Reporting Form to 347-396-2632.

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

With much appreciation,



Celia Quinn, MD, MPH  
Deputy Commissioner, Division of Disease Control