



NEW YORK CITY DEPARTMENT OF

HEALTH AND MENTAL HYGIENE

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Commissioner

2022 DOHMH Alert 21: West Nile Virus: Record Number of Positive Mosquito Pools in New York City Two Human Cases Reported

- **West Nile virus (WNV) has been detected in a record number of pools of mosquitoes collected in New York City; across all five boroughs.**
- **Two human cases have been reported, one each from Brooklyn and Queens.**
- **WNV infected mosquitoes are typically present in New York City (NYC) from July through October, with peak activity during August and September.**
- **WNV disease should be suspected in patients 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 in humans is IgM enzyme immunoassay on cerebrospinal fluid 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. Serologic testing should always be done concurrently with PCR.**
- **Advise patients, especially adults ages 60 years and older and 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 NYC Department of Health and Mental Hygiene.**

August 16, 2022

Dear Colleagues,

West Nile virus (WNV) has been detected in mosquitoes from all five boroughs of New York City (NYC). Two human cases of West Nile infection have been reported, one each from Brooklyn and Queens. Both patients were hospitalized with West Nile neuroinvasive disease (WNND); one has since been discharged. Across the United States, a total of 54 cases with four deaths have been reported. To date in 2022, the number of positive pools exceeds that of all prior years at this same time point. There are a total of 1,068 positive mosquito pools (Bronx=107, Brooklyn=202, Manhattan=40, Queens=330 and Staten Island=389) compared with 779 positive pools at the same time last season (2021). Mosquito populations continue to rise, with an average of 77 mosquitoes caught in each trap per day compared to 75 mosquitoes per trap/day for the same period in 2021. You can find real time surveillance data to monitor WNV activity in NYC [here](#). Climatic factors including precipitation and temperature contribute to increased WNV amplification in mosquitoes and mosquito reproduction rates. The Health Department has begun enhanced mosquito surveillance, as well as widespread larviciding and focused adulticiding to control mosquito populations.

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; gastrointestinal symptoms; and a transient maculopapular rash also are commonly reported. Less than 1% of infected persons develop 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. Consider WNV disease in patients with compatible symptoms, especially those with unexplained encephalitis, viral meningitis, or acute flaccid paralysis.

Over the past 10 years, an average of 16 (range 6-30) people have been diagnosed with WNND per year in NYC. The median age was 62 years and the case fatality rate 14%. By borough, the average incidence rate (per 100,000 people) was highest in Staten Island (0.4), followed by Queens (0.3), Brooklyn and Manhattan (0.2), and the Bronx (0.1). 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

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. 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 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 submit serum for serology when submitting specimens for PCR. PCR testing on CSF, or serum or plasma may be useful for severely immunocompromised patients and the only way to diagnose WNV infection in individuals who are unable to mount a detectable humoral immune response.

Immunohistochemical (IHC) staining is 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, (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.

Guidelines for West Nile Virus Testing and Reporting Cases of Encephalitis and Viral Meningitis, West Nile and other Arboviral Infections are available [here](#). This document includes a list of commercial laboratories that provide WNV serologic testing, viral PCR or viral isolation testing, and links to the

Wadsworth Center guidance for submitting CSF and serum for the PCR Viral Encephalitis and Arboviral Serology panels.

Viral Encephalitis PCR Summer Panel and Arboviral Serology Screen testing at Wadsworth Center's Viral Encephalitis Laboratory (VEL)*

Always attempt to submit serum for serology along with specimens submitted for the arboviral PCR panel.

Instructions, forms, and information for submitting specimens to the Wadsworth Center VEL for viral encephalitis PCR testing can be found [here](#), including:

- Collection and submission of specimens for viral encephalitis testing
- Infectious Diseases Requisition Form
- Wadsworth Center VEL shipping address for viral PCR panel specimens

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, 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. Telephone reports will need to be followed by a written report:

- Complete the electronic Universal Reporting Form [here](#); 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.

Sincerely,

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* 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. 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.