

WEST NILE VIRUS:

Testing and Reporting Guidelines for Cases of West Nile Virus and Other Arboviruses

(Revised July 2023)

- The IgM enzyme immunoassay (EIA) on cerebrospinal fluid (CSF) and/or serum is the most sensitive screening test for West Nile virus (WNV) on specimens collected at least 3 to 8 days after illness onset. Testing is available at most large commercial diagnostic laboratories and the Wadsworth Center Diagnostic Immunology Laboratory.
- PCR is less sensitive than EIA but may detect WNV in CSF within 2-8 days of illness onset. The Wadsworth Center Viral Encephalitis Laboratory performs a PCR panel on CSF specimens to detect WNV and several other encephalitic viruses; it is available only for hospitalized patients with encephalitis.

WHEN TO CONSIDER WEST NILE VIRAL TESTING FOR YOUR PATIENT

During peak adult mosquito season (July through October) consider and test for West Nile virus in patients suspected to have any of the following clinical syndromes:

(A) **Viral encephalitis**, characterized by:

- Fever >38°C or 100°F and,
- CNS involvement, including -altered mental status (altered level of consciousness, confusion, agitation, or lethargy) or other cortical signs (cranial nerve palsies, paresis or paralysis, or convulsions) and,
- Abnormal CSF profile suggesting a viral etiology (negative bacterial Gram stain and culture with a pleocytosis [WBC between 5 and 1500 cells/mm³] and/or elevated protein level [≥40 mg/dl]).

(B) **Viral meningitis**, characterized by:

- Fever >38°C or 100°F and,
- Headache, stiff neck and/or other meningeal signs and,
- Abnormal CSF profile suggesting viral etiology (negative bacterial Gram stain and culture with a pleocytosis [WBC of 5-1500 cells/mm³] and/or elevated protein level [≥40 mg/dl]).

(C) **Poliomyelitis-like syndromes**: acute flaccid paralysis or paresis, which may resemble Guillain-Barré syndrome, or other unexplained movement disorders such as tremor, myoclonus or Parkinson’s-like symptoms, especially if associated with atypical features, such as fever, altered mental status and/or a CSF pleocytosis. Afebrile illness with asymmetric weakness, with or without areflexia, has also been reported in association with West Nile virus.

(D) **Unexplained febrile illness**, especially if accompanied by headache, fatigue, myalgias, stiff neck, or rash.

DIAGNOSIS OF WEST NILE VIRUS INFECTION

The IgM enzyme immunoassay (EIA) to detect WNV specific IgM antibodies can be performed on CSF and serum and is the most sensitive screening test for West Nile virus. Because West Nile IgM may not be positive until up to 8 days following onset of illness, consider repeat testing if specimens collected less than 8 days after onset are negative. A positive West Nile IgG in the absence of a positive West Nile IgM is consistent with past infection with a flavivirus and does not by itself suggest acute West Nile virus infection. **If acute West Nile virus infection is suspected, it is best to collect both acute and convalescent sera. Convalescent specimens should be collected 3 weeks after acute specimens.**

Molecular testing to detect viral RNA such as reverse transcriptase-polymerase chain reaction (RT-PCR) on CSF may be helpful, but is significantly less sensitive than an antibody test. Specimens should be collected within 2-8 days of illness onset. If RT-PCR testing is pursued, it should be done in

addition to the IgM immunoassay. **Ideally, also collect a serum specimen to submit concurrently for IgM immunoassay testing.**

PCR testing on CSF, or serum or plasma may be useful, and for severely **immunocompromised** patients the only way, to diagnose West Nile virus infection in individuals who are unable to mount a detectable immune response. Immunohistochemical (IHC) staining is also available when brain tissue is available.

COMMERCIAL TESTING FOR WEST NILE VIRUS

Physicians are encouraged to seek West Nile virus antibody testing at commercial laboratories, or at your hospital laboratory if available. Commercial laboratories offering antibody testing for West Nile virus and for common encephalitis viruses by PCR include:

(This is not a complete list of all laboratories that perform West Nile virus serologic and PCR testing)

ARUP (Associated Regional and University Pathologists) 1-800-522-2787
aruplab.com

LabCorp 1-800-788-9091
labcorp.com/test-menu

Mayo Clinic 1-800-533-1710
mayocliniclabs.com

Quest Diagnostics 1-800-631-1390
testdirectory.questdiagnostics.com

WADSWORTH CENTER - IMMUNOLOGY AND RT-PCR VIRAL ENCEPHALITIS PANEL

Wadsworth Center offers both antibody testing and RT-PCR testing.

The Arboviral Immunology Screen can be performed on serum and CSF in the Diagnostic Immunology Laboratory. Serum testing includes *West Nile, Powassan, Eastern equine encephalitis, Western equine encephalitis, St. Louis encephalitis, and California serogroup encephalitis*. CSF testing is limited to *West Nile IgM*. Testing for *chikungunya, Zika, and dengue viruses*, is only available upon request and in consultation with the health department.

The RT-PCR Encephalitis Panel can be performed on CSF at the Viral Encephalitis Laboratory. The PCR 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*.

CSF specimens submitted for the encephalitis panel with an accompanying serum specimen should be sent frozen to the Viral Encephalitis Laboratory; specimens will be forwarded to the Diagnostic Immunology Lab where they will also perform the arboviral immunology screen.

REQUEST: Providers are also encouraged, but not required, to submit urine and whole blood specimens for patients to improve the detection of arboviral infection. Published studies show molecular detection is improved by the inclusion of these additional specimen types for Flavivirus testing. Wadsworth Center will be testing these additional specimens to assess their utility for other arboviruses.

Clinicians wishing only to test for HSV or enterovirus should consider referring specimens to a hospital or commercial laboratory for a quicker turn-around time.

The following instructions, forms and information for submitting specimens to the Wadsworth Center VEL can be found at wadsworth.org/programs/id/virology/services/encephalitis

1. Collection and Submission of Specimens for Viral Encephalitis Testing Instructions
2. Infectious Diseases Requisition Form
3. Wadsworth Center VEL shipping address

To obtain results for testing performed at the Wadsworth Center, facilities that submit directly to the Wadsworth Center should have access to the Health Provider Network (HPN). Information for obtaining HPN accounts, which can be used for numerous other functions, can be obtained by calling the Electronic Clinical Laboratory Reporting System (ECLRS) Help Desk at 1 (866) 529-1890. Positive results will also be communicated to the treating medical provider or the submitting laboratory by telephone. Results will not be transmitted by FAX.

CSF must be frozen at -70°C and shipped overnight on at least 5 lbs (2 kg) of dry ice. If CSF specimens arrive thawed, testing will not be performed. It is critical that the Wadsworth Center Infectious Diseases Requisition form be filled in completely and legibly for each specimen submitted. Include laboratory Permanent Facility Identifier (PFI), name and direct phone number for the laboratory contact, treating physician, date of illness onset, and any known travel, animal or arthropod contact with location and dates.

REPORTING

All cases of encephalitis (regardless of etiology) and West Nile virus and other laboratory-diagnosed arboviral infections must be reported to the New York City Health Department.

How to Report:

- Reporting Central (preferred): www1.nyc.gov/site/doh/providers/reporting-and-services/reporting-central.page (NYCMED account required or sign up for an account at nyc.gov/health/nycmed).
- Universal Reporting Form: nyc.gov/assets/doh/downloads/pdf/hcp/urf-0803.pdf; fax to 347-396-2632.
- Call the Provider Access Line at 866-692-3641.

FATAL ENCEPHALITIS CASES

Cases of fatal encephalitis of unknown etiology but suspected to be caused by an arboviral infection should be reported to the Health Department. If an autopsy is conducted, tissue samples, including brain, brainstem, and spinal cord can be submitted to the New York State Department of Health (NYSDOH) and the Centers for Disease Control and Prevention (CDC) for viral testing.

QUESTIONS?

During regular business hours, contact the:

- NYC Health Department’s Provider Access Line at 866-692-3641 to report a cluster of cases or an individual urgent case, such as a suspected West Nile virus case due to transfusion or organ transplantation.
- NYSDOH Viral Encephalitis Laboratory at 518-474-4177 for questions about the RT-PCR panel.
- NYSDOH Diagnostic Immunology Laboratory at 518-474-4177 for questions about antibody testing.