MAYO CLINIC LABORATORIES

Test Definition: WNVSI

West Nile Serum Interpretation

Overview

Useful For

Interpretation of testing for a laboratory diagnosis of infection with West Nile virus

Method Name

Only orderable as part of a profile. For more information see WNS / West Nile Virus Antibody, IgG and IgM, Serum.

Technical Interpretation

NY State Available

No

Specimen

Specimen Type

Serum

Reject Due To

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

West Nile virus (WNV) is a mosquito-borne flavivirus (single-stranded RNA) that primarily infects birds and can also infect humans and horses. WNV was first isolated in 1937 from an infected person in the West Nile district of Uganda. Until the viral infection was recognized in 1999 in birds in New York City, WNV was found only in the Eastern Hemisphere, with wide distribution in Africa, Asia, the Middle East, and Europe.(1-3) Most recently, in 2012, a total of 5674 cases of WNV were reported to the Centers for Disease Control and Prevention, among which 2873 (51%) were classified as neuroinvasive disease (eg, meningitis or encephalitis) and 286 (5%) cases resulted in death.(2)

Most people who are infected with WNV will not develop clinical signs of illness. It is estimated that about 20% of those who become infected will develop West Nile fever with mild symptoms, including fever, headache, myalgia, and occasionally a skin rash on the trunk of the body. Case fatality rates among patients hospitalized during recent outbreaks

have ranged from 4% to 14%. Advanced age is the most important risk factor for death, and patients older than 70 years of age are at particularly high risk.(1)

Laboratory diagnosis is best achieved by demonstration of specific IgG and IgM class antibodies in serum specimens. Polymerase chain reaction (PCR) tests (WNVS / West Nile Virus, RNA, PCR, Molecular Detection, Serum) can detect WNV RNA in serum specimens from patients with recent WNV infection (ie, 3 to 5 days following infection) when specific antibodies to the virus are not yet present. However, the likelihood of detection is relatively low as the sensitivity of PCR detection is approximately 55% in cerebrospinal fluid and approximately 10% in blood from patients with known WNV infection.

Reference Values

Only orderable as part of a profile. For more information see WNS / West Nile Virus Antibody, IgG and IgM, Serum.

An interpretive report will be provided.

Interpretation

IgG:
The presence of IgG-class antibodies to West Nile virus (WNV) in serum indicates infection with WNV at some time in the past. By 3 weeks postinfection, virtually all infected persons should have developed IgG antibodies to WNV. If acute-phase infection is suspected, serum specimens drawn within approximately 7 days postinfection should be compared with a specimen drawn approximately 14 to 21 days after infection to demonstrate rising IgG antibody levels between the 2 serum specimens.

IgM:
Presence of specific IgM-class antibodies in a serum specimen is consistent with acute-phase infection with WNV. By the 8th day of illness, most infected persons will have detectable serum IgM antibody to WNV; in most cases it will be detectable for at least 1 to 2 months following disease resolution and, in some cases, will be detectable for 12 months or longer.

The absence of IgM antibodies to WNV is consistent with lack of acute-phase infection with this virus. Specimens collected too early in the acute phase (eg, before 8-10 days postinfection) may be negative for IgM-specific antibodies to WNV. If WNV is suspected, a second specimen collected approximately 14 days postinfection should be tested.

In the very early stages of WNV infection, IgM may be detectable in cerebrospinal fluid before it becomes detectable in serum.

Cautions

Test results should be used in conjunction with a clinical evaluation and other available diagnostic procedures.

The significance of negative test results in immunosuppressed patients is uncertain.

Positive test results may not be valid in persons who have received blood transfusions or other blood products within the past several months.

False-negative results due to competition by high levels of IgG, while theoretically possible, have not been observed.

False-positive results may occur in persons vaccinated for flaviviruses (eg, yellow fever, Japanese encephalitis, dengue).

False-positive results may occur in patients infected with other arboviruses, including flaviviruses (eg, dengue virus) and alphaviruses (eg, LaCrosse [California] encephalitis virus, Eastern or Western equine encephalitis virus, St. Louis virus) and in persons previously infected with West Nile virus (WNV). Because closely related arboviruses exhibit serologic cross-reactivity, it sometimes may be epidemiologically important to attempt to pinpoint the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses.

WNV antibody results for cerebrospinal fluid (CSF) should be interpreted with caution. Complicating factors include low antibody levels found in CSF, passive transfer of antibody from blood, and contamination via a traumatic lumbar puncture.

Clinical Reference

1. Petersen LR, Marfin AA. West Nile Virus: a primer for the clinician. Ann Intern Med. 2002;137(3):173-179
2. Centers for Disease Control and Prevention (CDC). West Nile virus and other arboviral diseases--United States, 2012. MMWR Morb Mortal Wkly Rep. 2013;62(25):513-517
3. Brinton MA. The molecular biology of West Nile Virus. a new invader of the western hemisphere. Ann Rev Microbiol. 2002;56:371-402
4. Centers for Disease Control and Prevention (CDC). Provisional surveillance summary of the West Nile virus epidemic--United States, January-November 2002. MMWR Morb Mortal Wkly Rep. 2002;51(50):1129-1133
5. Centers for Disease Control and Prevention (CDC). Investigations of West Nile virus infections in recipients of blood transfusions. MMWR Morb Mortal Wkly Rep. 2002;51(43):973-974

Performance

Method Description

Automated interpretation of IgM and IgG antibody results for West Nile virus.

PDF Report

No

Day(s) Performed

Monday, Wednesday, Friday

Report Available

Same day/1 day

Specimen Retention Time

14 days

Performing Laboratory Location

Jacksonville

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

Not Applicable

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
WNVSI	West Nile Serum Interpretation	69048-7

Result ID	Test Result Name	Result LOINC® Value
WNVSI	West Nile Serum Interpretation	69048-7