Test Definition: WNMS

West Nile Virus Ab, IgM, S

Overview

Useful For

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.

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

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

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject
Other	Heat Inactivated specimen

Specimen Stability Information

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

Clinical and Interpretive

Clinical Information

West Nile virus (WNV) is a mosquito-borne flavivirus (single-stranded RNA) that primarily infects birds but 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 5,674 cases of WNV were reported to the Centers for Disease Control and Prevention (CDC), among which 2,873 (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. PCR (WNVP / West Nile Virus (WNV), Molecular Detection, PCR, Plasma) can detect WNV RNA in plasma 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.

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 drawn too early in the acute phase (eg, before 8 to 10 days post-infection) may be negative for IgM-specific antibodies to WNV. If WNV is suspected, a second specimen drawn approximately 14 days postinfection should be tested.

In the very early stages of WNV infection, IgM may be detectable in cerebrospinal fluid (CSF) 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 alphavirusis (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, Marafin AA: West Nile Virus: a primer for the clinician. Ann Intern Med 2002;137:173-179

2. MMWR: West Nile Virus and Other Arboviral Diseases-United States, 2012. MMWR. 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

Polystyrene microwells are coated with the antihuman antibody specific for IgM (u-chain). Diluted serum specimens and controls are incubated in the wells, and IgM present in the specimen binds to the antihuman antibody (IgM specific) in the wells. Nonspecific reactants are removed by washing. WNV antigen is then added to the wells and incubated. If anti-WNV IgM is present in the specimen, the WNV antigen binds to the anti-WNV in the well. Unbound WNV antigen is then removed by washing the well. Mouse antiflavivirus conjugated with horseradish peroxidase (HRPO) is then added to the wells and incubated. If WNV antigen has been retained in the well by the antiflavivirus in the specimen, the mouse antiflavivirus:HRPO binds to WNV antigen in the wells. Excess conjugate is removed by washing. Enzyme substrate and chromogen are added, and the color is allowed to develop. After adding the Stop reagent, the resultant color change is quantified by a spectrophotometric reading of optical density (OD) that is directly proportional to the amount of antigen-specific IgM present in the specimen. Specimen OD readings are compared with reference cutoff OD readings to determine results.(Package insert: Flavivirus [West Nile] IgM Capture ELISA. Focus Technologies, Cypress CA)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday, Wednesday, Friday; 9 a.m.

Analytic Time

Same day/1 day

Specimen Retention Time

14 Days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

86788

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
WNMS	West Nile Virus Ab, IgM, S	29567-5

Result ID	Test Result Name	Result LOINC Value
WNMS	West Nile Virus Ab, IgM, S	29567-5