Nebraska Department of Health and Human Services

Health Alert Network

UPDATE

July 9, 2024

West Nile Virus in Nebraska

In 2023 the Nebraska Department of Health and Human Services recorded 150 West Nile virus (WNV) human disease cases. Ninety-one (61%) of these cases were classified as the severe neuroinvasive disease form with 10 deaths reported. To date there have been several human WNV disease and blood donor detections and three positive mosquito samples this season in the state. However, WNV activity typically begins picking up in July. Weekly WNV surveillance reports can be found by visiting the DHHS WNV Surveillance Data webpage: dhhs.ne.gov/wnv

Human WNV infections generally follow in the wake of positive mosquito pools, typically beginning in mid-July, peaking around Labor Day, and disappearing around mid-September. Most WNV-infected persons (approximately 80%) are asymptomatic. Those who develop symptoms typically do after a 3–14 day incubation period. Approximately 1 in 5 people who are infected will develop a febrile disease. Symptoms of febrile disease include: fever, headache, fatigue, myalgia/arthralgia, skin rash on the trunk of the body, swollen lymph glands, and eye pain. Some people (1 in 150) will develop neuroinvasive disease that affects the central nervous system including encephalitis or meningitis. Other symptoms of neuroinvasive disease include: high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision change/loss, numbness, and paralysis (see WNV diagnosis algorithm below). In immunocompetent individuals at the time of initial symptom onset, the viremia has usually resolved, and the patient is seropositive for IgM antibodies. Infected persons appear to develop permanent immunity and cannot be re-infected.

Recommended WNV Training & Assessment

This module is an assessment of clinicians' epidemiologic, clinical, and diagnostic management of WNV disease. The module may be found here: https://www.cdc.gov/west-nile-virus/hcp/clinical-signs/clinician-training.html

Laboratory testing

Patients suspected of WNV infection (with or without neuroinvasive disease) should be tested via PCR and/or for IgM antibodies to WNV depending on immunosuppression status (see diagnostic testing algorithm below). Both tests are widely available at commercial labs.

If neuroinvasive WNV is suspected (the patient has signs and symptoms consistent with meningitis, encephalitis, or acute flaccid paralysis), PCR and IgM antibody testing can be performed at the Nebraska Public Health Lab (NPHL) at DHHS expense without approval between July 1 and October 31. Use the following criteria:

1. For serum, collect blood into a serum separator tube, separate serum from cells ASAP or within 2 hours of collection, and transfer >1ml of serum to a sterile container. Blood for PCR may also be collected in a lavender (EDTA) vacutainer tube. For CSF, transfer >1ml to a sterile container. Note, that it is preferred that the CSF specimen be paired with a serum specimen for WNV testing.

2. Send specimens to the NPHL accompanied by a NPHL requisition indicating in comments “WNV IgM (WNAB)” for serum and “WNV PCR (WNLPCR)” for CSF. If CSF only, order “WNV IgM (WNABC)” along with “WNV PCR (WNVPCR)”. The requisition can be printed off via NPHL’s website at https://www.nphl.org/ under “Test Directory” and “NPHL Test Request Form”.

   (Health facilities that have electronic access to NUlirt may place orders directly using the order codes WNAB and WNLPCR. If electronic access is not available, health facilities may also become users of NUlirt by visiting https://www.nphl.org/index.cfm/nulirt/ for instructions on how to obtain credentials to use this electronic system.)

3. Submit specimens via courier to the NPHL under refrigeration.

WNV Serology Testing Interpretation Guidelines

- Testing (+) for IgM and (-) for IgG in an acute specimen is consistent with acute WNV infection. Paired acute and convalescent samples may be useful for demonstration of seroconversion and laboratory confirmation of WNV infection.

- Testing (+) for IgG and (-) for IgM is consistent with infection in the distant past.

- CSF which tests (+) for IgM is consistent with acute meningitis/encephalitis.

- Stable antibody titers on acute and convalescent specimens suggest infection in the distant past. A four-fold rise in IgM or IgG titers between an acute and convalescent specimen suggests acute infection.

Tests	Results	Interpretation
IgM IgG	negative negative	Antibody not detected = no evidence of current or past infection
IgM IgG	negative positive	Infection at an undetermined time = past infection
IgM IgG	positive negative	Evidence of recent or current infection§
IgM IgG	positive positive	Evidence of recent or current infection†
IgM IgG	indeterminate negative	Inconclusive; request convalescent serum§

§Paired acute and convalescent samples may be useful for demonstration of seroconversion
†Some individuals may have persisting IgM and IgG antibodies from the previous WNV season

Additional Information

CDC Clinical Testing and Diagnosis: https://www.cdc.gov/west-nile-virus/hcp/diagnosis-testing/index.html
CDC Clinical Signs and Symptoms: https://www.cdc.gov/west-nile-virus/hcp/clinical-signs/index.html
CDC Treatment and Prevention: https://www.cdc.gov/west-nile-virus/hcp/treatment-prevention/index.html
Nebraska DHHS WNV Page: https://dhhs.ne.gov/pages/west-nile-virus.aspx

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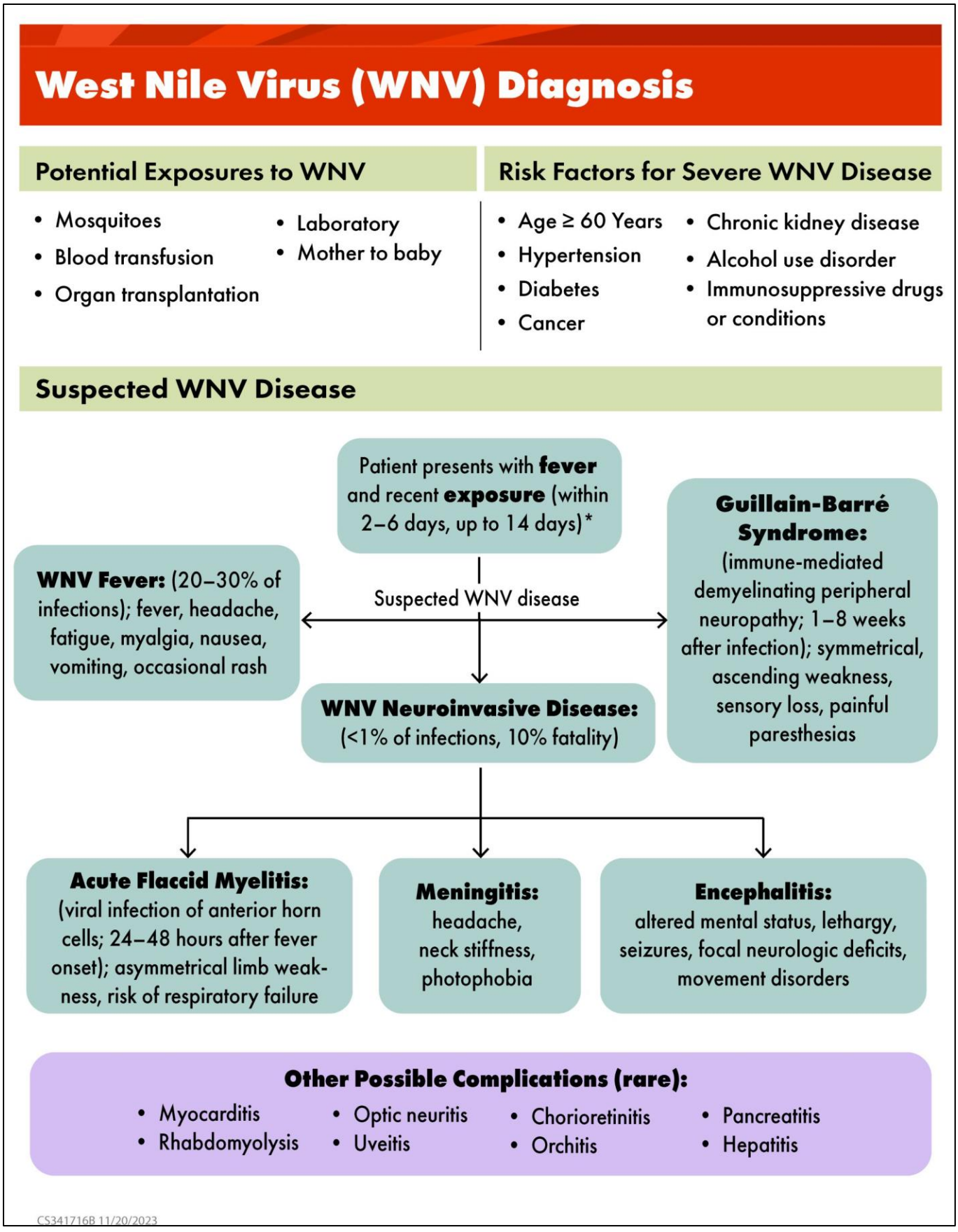
WNV Diagnostic Algorithm



WNV Diagnostic Testing Algorithm