

Appendix VI

Surveillance for West Nile virus (WNV) Illness

Ontario's WNV case definition is based on Health Canada's case definition. At the time of writing, Health Canada's case definition had not been completed. Ontario's case definition will be updated in order to be consistent with the Health Canada case definition upon completion. Both Ontario's and Health Canada's case definitions were drafted with available information at the time of writing. Case definitions and diagnostic test criteria are subject to change as new information becomes available.

For surveillance purposes, WNV Illness will consist of WNV Neurological Manifestations (WNNM), WNV Fever (WNVF), and WNV Asymptomatic Infection (WNAI). WNNM and WNVF will each consist of the categories "Suspect", "Possible", "Probable", and "Confirmed", and WNAI will consist of the categories "Probable" and "Confirmed", respectively, depending on laboratory diagnostic test results.

The case definitions have two criteria for each of WNNM, WNVF, and WNAI. One criterion is based on clinical features of the illness and the other criterion is based on laboratory test results.

A. Case Definitions:

1) West Nile virus Neurological Manifestations (WNNM):

Clinical Criteria:

History of exposure in an area where WNV activity is occurring ^a

OR

history of exposure to an alternate mode of transmission ^b

AND

onset of fever

AND AT LEAST ONE associated neurological manifestation consistent with a diagnosis

of

- encephalitis or meningoencephalitis, or
- viral meningitis, or
- acute flaccid paralysis (poliomyelitis-like syndrome or Guillain-Barré-like syndrome). ^c

Note: A significant feature of WNV encephalitis may be marked muscle weakness, therefore WNV should be considered in the differential diagnosis of all suspected cases of acute flaccid paralysis that is more frequently unilateral, but could be bilateral, with or without sensory deficit. Emerging clinical syndromes, identified during 2002, included: movement disorders (e.g., tremor, myoclonus); parkinsonism (e.g., cogwheel rigidity, bradykinesia, postural instability); rhabdomyolysis (acute destruction of skeletal muscle cells). Other clinical syndromes that were identified during 2002 included, but were not limited to the following: peripheral neuropathy; polyradiculopathy; optic neuritis; and acute demyelinating encephalomyelitis (ADEM).

^a **Note:** History of exposure when and where WNV transmission is present, or could be present, or history of travel to an area with confirmed WNV activity in birds, horses, other mammals, sentinel chickens, mosquitoes, or humans.

^b **Note:** Alternate modes of transmission identified to date include: laboratory-acquired; *in utero*; receipt of blood components; organ/tissue transplant; and, possibly via breast milk.

^c **Note:** A person with WNV-associated acute flaccid paralysis may present with or without fever or mental status changes (altered mental status could range from confusion to coma with or without additional signs of brain dysfunction (e.g. paresis or paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions and abnormal movements)).

Suspect WNNM Case:

Clinical criteria IN THE ABSENCE OF OR PENDING any diagnostic test criteria (see B. West Nile Virus Diagnostic Criteria) AND IN THE ABSENCE of any other obvious cause.

Possible WNNM Case:

Clinical criteria AND AT LEAST ONE of the possible case diagnostic test criteria (see B.1).

Probable WNNM Case:

Clinical criteria AND AT LEAST ONE of the probable case diagnostic test criteria (see B.2).

Confirmed WNNM Case:

Clinical criteria AND AT LEAST ONE of the confirmed case diagnostic test criteria (see B.3).

2) West Nile virus Fever (WNF):

Clinical Criteria:

History of exposure in an area where WNV activity is occurring ^a

OR

history of exposure to an alternate mode of transmission ^b

AND

onset of fever

AND AT LEAST ONE of the following: ^d

- myalgia, or
- arthralgia, or
- headache, or
- fatigue, or
- photophobia, or
- lymphadenopathy, or
- maculopapular rash

^d **Note:** It is possible that other clinical symptoms could be identified that have not been listed and may accompany probable case or confirmed case diagnostic test criteria.

Suspect WNF Case:

Clinical criteria IN THE ABSENCE OF OR PENDING any diagnostic test criteria (see B. West Nile Virus Diagnostic Criteria) AND IN THE ABSENCE of any other obvious cause.

Possible WNF Case:

Clinical criteria AND AT LEAST ONE of the possible case diagnostic test criteria (see B.1).

Probable WNF Case:

Clinical criteria AND AT LEAST ONE of the probable case diagnostic test criteria (see B.2)

Confirmed WNF Case:

Clinical criteria AND AT LEAST ONE of the confirmed case diagnostic test criteria (see B.3)

3) West Nile virus Asymptomatic Infection (WNAI):^e

Probable WNAI Case:

Probable case diagnostic test criteria (see B.2) IN THE ABSENCE of clinical criteria

Confirmed WNAI Case:

Confirmed case diagnostic test criteria (see B.3) IN THE ABSENCE of clinical criteria

^e **Note:** This category could include asymptomatic blood donors whose blood is screened using a Nucleic Acid Amplification Test (NAT), by Blood Operators (i.e. Canadian Blood Services or Hema-Quebec) and is subsequently brought to the attention of public health officials. The NAT assay that will be used by Blood Operators in Canada is designed to detect all viruses in the Japanese encephalitis (JE) serocomplex. The JE serocomplex includes WNV and 9 other viruses, although from this group only WNV and St Louis encephalitis virus are currently endemic to parts of North America. Further testing, outlined in part B, will be necessary to identify the specific virus from a blood donor with a reported positive donor screening test.

B. West Nile virus Diagnostic Test Criteria:

B.1 Possible Case Diagnostic Test Criteria:

AT LEAST ONE of the following:

B.1.1 - A single serum sample which is indeterminate (i.e., a positive to negative (P to N) ratio greater than 2 and less than 3) for WNV IgM by IgM capture ELISA,
or

B.1.2 - A single titre greater than or equal to 1:10 and less than 1:320 on haemagglutination inhibition (HI), or a stable HI titre in acute and convalescent sera.

Note: The use of the possible case category is at the discretion of the Province/Territory or other jurisdiction. The possible case category could include the following: laboratory diagnoses that most likely represent WNV infection from a previous season; OR, persons with static titres on acute and convalescent sera; OR, persons from whom only a single serum sample is available and cannot be resolved using either WNV IgM ELISA or flavivirus haemagglutination

inhibition (HI).

B.2 Probable Case Diagnostic Test Criteria:

Early in the WNV season each year, the first five cases in a health unit jurisdiction who have positive assays noted below in B.2.1, B.2.2, B.2.3, B.2.4 and/or B.2.5 will require confirmation by Plaque Reduction Neutralization Test (PRNT). After the first five cases have been confirmed, positive assays noted in B.2.1, B.2.2, B.2.3, B.2.4 and/or B.2.5 will be considered a confirmed case.

AT LEAST ONE of the following:

B.2.1 - A single serum sample which is positive (i.e., with positive to negative (P to N) ratio greater than or equal to 3) for WNV IgM by IgM capture ELISA, ^f
[note that IgM ELISA will be the principal screening test for the 2003 season]

or

B.2.2 - A single elevated titre greater than or equal to 1:320 by haemagglutination inhibition (HI) in serum ,

or

B.2.3 - A four-fold or greater change in HI or enzyme-linked immunosorbent assay (ELISA) IgG titres in paired acute and convalescent sera,

or

B.2.4 - Demonstration of IgM antibody to WNV in CSF by IgM-capture ELISA,

or

B.2.5 - Demonstration of Japanese encephalitis (JE) serocomplex-specific genomic sequences in blood by NAT screening tests on donor blood, by Blood Operators in Canada.

Note: Immunocompromised individuals may not be able to or may be slow to mount an immune response necessary for a serological diagnosis. WNV diagnostic test criteria for these individuals should be discussed with a medical microbiologist.

B.3 Confirmed Case Diagnostic Test Criteria:

Early in the WNV season each year, the first five positive cases in a health unit jurisdiction who have positive assays noted below in B.3.1, B.3.2, B.3.3, and B.3.4 will require confirmation by B.3.5 (i.e., PRNT). After the first five are confirmed, positive assays noted in B.3.1, B.3.2, B.3.3, and B.3.4 (or B.2.1, B.2.2, B.2.3, B.2.4 and/or B.2.5) will be considered a confirmed case. Subsequently, a "to be determined" number of assays noted in B.3.1, B.3.2, B.3.3, and B.3.4 (or B.2.1, B.2.2, B.2.3, and/or B.2.4) will be routinely confirmed by B.3.5 (i.e., PRNT) throughout the WNV season in order to rule-out the possibility of concurrent activity by other flaviviruses.

AT LEAST ONE of the following:

B.3.1 - A single serum sample which is positive (i.e., with positive to negative (P to N) ratio greater than or equal to 3) for WNV IgM by IgM capture ELISA ^f ,
[note that IgM ELISA will be the principal screening test for the 2003 season]

or

B.3.2 - A single elevated titre greater than or equal to 1:320 by haemagglutination inhibition

(HI) in serum,
or

B.3.3 - A four-fold or greater change in HI or enzyme-linked immunosorbent assay (ELISA) IgG titres in paired acute and convalescent sera,

or

B.3.4 - Demonstration of IgM antibody to WNV in CSF by IgM-capture ELISA,

AND

B.3.5 – Confirmation of assays noted in B.3.1, B.3.2, B.3.3, and B.3.4 by Plaque Reduction Neutralization Test (PRNT)

OR

B.3.6 - Isolation of WNV from, or demonstration of WN virus antigen or WN virus-specific genomic sequences in tissue, blood, CSF or other body fluids

Note: Immunocompromised individuals may not be able to or may be slow to mount an immune response necessary for a serological diagnosis. West Nile virus diagnostic test criteria for these individuals should be discussed with a medical microbiologist.

^f **Note:** Longitudinal studies of encephalitis cases due to WNV have shown that WN virus-specific IgM antibody may persist in serum for 12 months or longer in a small number of patients. Thus, the presence of serum anti-WN viral IgM antibody in an asymptomatic individual is not necessarily diagnostic of *acute* WN viral infection.