



## West Nile Virus: Fact Sheet #2

### Information for Physicians and Health Care Workers

For most Canadians, the risk of West Nile virus infection is low, and the risk of serious health effects from the virus is even lower. However, anyone exposed to mosquitoes in an area where West Nile virus has been detected is at some risk for infection.

#### What is West Nile virus?

West Nile virus belongs to a family of viruses called Flaviviridae. It is spread by mosquitoes that have fed on the blood of infected birds. West Nile virus is closely related to the viruses that cause Dengue fever, Yellow fever and St. Louis encephalitis.

#### Definitions of "Probable" and "Confirmed" for human West Nile virus cases

The following are the case definitions for "Probable" and "Confirmed" West Nile virus.

##### Probable Case

A person who has symptoms and history consistent with West Nile virus illness, and who has laboratory tests demonstrating a four-fold or greater change in haemagglutination inhibition (HI) or enzyme-linked immunosorbent assay (ELISA) titres in paired acute and convalescent sera, but without further confirmatory testing.

##### Confirmed Case

A person who has symptoms and history consistent with West Nile virus illness, and who has laboratory tests demonstrating,

- a. a four-fold or greater change in haemagglutination inhibition or enzyme-linked immunosorbent assay (ELISA) titres in paired acute and convalescent sera with confirmation by a Plaque Reduction Neutralizing Test (PRNT), or
- b. isolation of West Nile virus from or demonstration of West Nile virus antigen or genomic sequences in tissue, blood, cerebrospinal fluid, or other body fluid. Detection of West Nile virus genome should be shown by at least two different amplification assays that target distinct regions of the viral RNA, or
- c. demonstration of IgM antibody to West Nile virus in CSF by IgM-capture ELISA with confirmation by a PRNT.



## **Clinical Features**

### Mild Infection

Most West Nile virus infections are mild and often clinically unapparent.

- Approximately 20% of those infected develop a mild illness (West Nile fever).
- The incubation period is thought to range from 3 to 14 days.
- Symptoms generally last 3 to 6 days.

Reports from earlier outbreaks describe the mild form of West Nile virus infection as a febrile illness of sudden onset often accompanied by:

- |            |                   |
|------------|-------------------|
| ▶ malaise  | ▶ headache        |
| ▶ anorexia | ▶ myalgia         |
| ▶ nausea   | ▶ rash            |
| ▶ vomiting | ▶ lymphadenopathy |
| ▶ eye pain |                   |

### Severe Infection

Approximately 1 in 150 infections will result in more severe neurological disease.

- Risk factors for developing severe neurological disease include advanced age and being immunocompromised.
- Encephalitis is more commonly reported than meningitis.

In recent outbreaks, symptoms occurring among patients hospitalized with severe disease included:

- |            |                             |
|------------|-----------------------------|
| ▶ fever    | ▶ gastrointestinal symptoms |
| ▶ weakness | ▶ change in mental status   |



- Neurological presentations included:
  - ▶ severe muscle weakness and flaccid paralysis
  - ▶ ataxia and extrapyramidal signs
  - ▶ cranial nerve abnormalities
  - ▶ myelitis
  - ▶ optic neuritis
  - ▶ polyradiculitis
  - ▶ seizures
  
- A minority of patients with severe disease developed a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs.

Although not observed in recent North American outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have also been described in the literature.

### **Clinical Suspicion**

Diagnosis of West Nile virus infection is based on a high index of clinical suspicion and obtaining specific laboratory tests.

- West Nile virus, or other arboviral diseases such as St. Louis encephalitis, should be strongly considered in adults >50 years who develop unexplained encephalitis or meningitis during the summer or early fall.
- The local presence of West Nile virus enzootic activity or other human cases should further raise suspicion.
- Obtaining a recent travel history is also important.

Note: Severe neurological disease due to West Nile virus infection has occurred in patients of all ages. Year-round transmission is possible in some areas. Therefore, West Nile virus should be considered in all persons with unexplained encephalitis and meningitis.

### **Diagnosis and Reporting**

West Nile is a reportable disease in the Northwest Territories.



### **Diagnostic Testing**

- The most efficient diagnostic method is detection of IgM antibody to West Nile virus in serum or cerebral spinal fluid (CSF) collected within 8 days of illness onset using the IgM antibody capture enzyme-linked immunosorbent assay (MAC-ELISA).
- Since IgM antibody does not cross the blood-brain barrier, IgM antibody in CSF strongly suggests central nervous system infection.
- Patients who have been recently vaccinated against or recently infected with related flaviviruses (e.g., yellow fever, Japanese encephalitis, dengue) may have positive West Nile virus MAC-ELISA results.

### **Laboratory Findings**

- Total leukocyte counts in peripheral blood are mostly normal or may be elevated, with associated lymphocytopenia and anemia.
- Hyponatremia is sometimes present, particularly among patients with encephalitis.
- Examination of the cerebrospinal fluid (CSF) may reveal pleocytosis, meaning increased number of lymphocytes in the cerebrospinal fluid.
- CFS Protein is universally elevated.
- CFS Glucose is normal.
- Computed tomographic scans of the brain may not show evidence of acute disease. In about one-third of patients, magnetic resonance imaging will show enhancement of the leptomeninges, the periventricular areas, or both.

### **Treatment**

Treatment is supportive, often involving hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections for patients with severe disease.

- Ribavirin in high doses and interferon alpha-2b have been found to have some activity against West Nile virus in vitro, but no controlled studies have been completed on the use of these or other medications, including steroids, antiseizure drugs, or osmotic agents, in the management of West Nile virus encephalitis.

### **For further information:**

Contact the Office of The Chief Medical Health Officer at (867) 920-8877.

Visit the following websites:

[www.hlthss.gov.nt.ca](http://www.hlthss.gov.nt.ca) – NWT Department of Health and Social Services (See Programs & Services Section)

[http://www.hc-sc.gc.ca/dc-ma/wnv-vno/index\\_e.html](http://www.hc-sc.gc.ca/dc-ma/wnv-vno/index_e.html) – Health Canada