simcoe muskoka
DISTRICT HEALTH UNIT

HealthFAX

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First Probable West Nile Virus Case in the Simcoe-Muskoka Area

Attention: Physicians, Emergency Departments, Infection Control Practitioners, Walk-In Clinics/Urgent Care Clinics, Nurse Practitioners

Date: July 28, 2014

The Simcoe Muskoka District Health Unit has received the first lab report for a probable case of West Nile Virus (WNV) in an individual from the Wahta Mohawk Territory. The following is an update of the West Nile Virus activity in Ontario and Canada.

Ontario

- As of July 19, 2014, there has been no West Nile Virus activity in the province of Ontario.

Canada

- As of July 22, 2014, there has been no reported activity in Canada.

United States

- Overall: 30 states reporting WNV activity (e.g., birds, mosquito pools, humans)
- Human cases: 35 human cases of WNV have been reported
- Positive Mosquito Pools: 509 positive pools have been found in 17 states

Clinical Presentation

West Nile Non-neurological Syndrome
20% of infected West Nile cases present with non-neurological symptoms. These symptoms include:

- Fever
- Myalgia
- Arthralgia
- Headache
- Fatique
- Lymphodenopathy
- Maculopapular rash
- Other signs and symptoms are possible (e.g. GI symptoms)

West Nile Neurological Syndrome

Less than 1% of infected West Nile cases present with neurological symptoms. Severe manifestations can occur in all age groups but there are increased risk and incidence of severe neurological illness with increasing age. These symptoms include:

- Encephalitis (acute signs of central or peripheral neurologic dysfunction)
- Viral meningitis (pleocytosis and signs of infection)
- Acute flaccid paralysis (e.g. poliomyelitis-like syndrome or GBS)
- Movement disorders (e.g. tremor, myoclonus)
- Parkinsonism or Parkinsonia-like conditions (e.g. cogwheel rigidity, bradykinesia, postural instability); or
- Other neurological syndromes

Tel: 705-721-7520 1-877-721-7520 Fax: 705-721-1495

Laboratory Testing - Diagnostic Testing of Acute Cases (IgM)

Specimen Type

- Serology: serum, CSF (must also be submitted together with a serum sample.
- Molecular testing (RT-PCR): EDTA blood, plasma (or serum), CSF. Serology is the preferred method of testing. If considering molecular testing, contact PHOL Customer Service to speak to a microbiologist for approval.

Container/Kit

- Serology: Clotted blood - vacutainer tubes (SST) for serum.
- Molecular testing (RT-PCR): EDTA blood, plasma with non-heparin anticoagulant (or serum), CSF.

Collection information

- To order Collection Kits or other PHOL Supplies complete the Requisition for Containers and Supplies. The form should be faxed to PHOL, Toronto at 416-235-5753 or OPHOL at 705-329-6001.

Minimum volume required

- Serology: 5.0 ml blood or 1.0 ml serum
- Molecular testing: 400 µl of CSF, EDTA blood, serum or plasma.

Requisition

- Please complete all fields in the General Test Requisition. Ensure the following information is provided:
    - Mosquito bite history
    - Symptoms
    - Onset date
    - Relevant travel history
    - History of Japanese encephalitis virus vaccination or yellow fever vaccination

Limitation

- Haemolysed, icteric, lipemic or microbially contaminated sera or plasma are not recommended for testing.

Test Information

- Specimens for West Nile virus-(WNV) IgG and IgM serology are performed using enzyme–linked immunosorbent assay (ELISA).
- Specimens may also undergo plaque reduction neutralization testing (PRNT).
- West Nile avidity testing may be considered in order to differentiate recent (last few months) from remote infections. This should only be considered in patients with severe illness (e.g. hospitalized). Contact PHOL Customer Service to speak to a microbiologist for approval.
- For further testing information refer to labstract titled: LAB-SD-011, West Nile Virus Update - Interpretation of serology results and investigation of cases with neurological involvement.
- Please use web page below for more information. http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/West_Nile_Virus Serology.aspx

Attached are interpretation guidelines for WNV serology results. More information can be found on our website: http://www.simcoemuskokahealth.org

If you suspect a case of West Nile Virus or have questions regarding proper specimen collection, please contact the Simcoe Muskoka District Health Unit Communicable Disease Team at 705-721-7520or 1-877-721-7520 Ext. 8809.

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Public Health Ontario / Santé publique Ontario
PARTNERS FOR HEALTH / PARTENAIRES POUR LA SANTÉ

Public Health Laboratory
Laboratoire de santé publique

Labstract June 2013

West Nile Virus Update – Interpretation of serology results and investigation of cases with neurological involvement

To Health Care Providers:

This Labstract provides:

1. Guidance on interpretation of WNV serological test results.
2. An update on confirmatory Plaque Reduction Neutralization Test (PRNT) testing of positives in health regions.
3. An update on recommended laboratory investigations and specimen requirements for cases of suspected WNV infection and cases with neurological involvement.

1. Interpretation of WNV serological test results (refer to Table 1)

Enzyme-linked Immunosorbent Assays (ELISAs)
The WNV IgM and IgG Enzyme–Linked Immunosorbent Assays (ELISAs) are used as screening tests: a reactive IgM antibody response using ELISA is specific for WNV and is rarely due to cross-reaction with other flaviviruses.

- If a patient has recently travelled to an area endemic for flaviviruses other than WNV, please document this on the laboratory requisition and contact the laboratory to request any follow up investigations if they are WNV IgM positive.
- Any recent tick bites (the vector for Powassan virus, which is endemic in Ontario) should be documented.
- A reactive IgG antibody response using ELISA may be due to infection with WNV or other flaviviruses, (e.g. dengue, St. Louis encephalitis, Japanese encephalitis, Powassan, or yellow fever virus) which may cross react.

Specimen Requirements and test ordering
Acute and convalescent serology (clotted blood or serum) should be submitted to confirm a recent infection.
When ordering serology:

- Use a Public Health Ontario Laboratory (PHOL) requisition form and enter "West Nile Virus" under test description
- Indicate that the test is for **suspect West Nile Virus**, symptoms, date of any significant mosquito exposures, symptom onset date, any travel history, and whether the test is for acute or convalescent serology testing.

Ontario Agency for Health Protection and Promotion / Agence de protection et de promotion de la santé

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West Nile Virus Update – Interpretation of serology results and investigation of cases with neurological involvement (Continued)

2. Confirmatory PRNT testing of positives in health regions

Plaque Reduction Neutralization Test (PRNT)

All early season IgM reactive samples will be further tested using the confirmatory plaque reduction neutralization test (PRNT) which is highly specific for WNV. However, PRNT testing is not necessary to make a diagnosis of WNV infection once WNV season is established within the local health region (3 positive PRNT results in an individual health region), at which time a reactive IgM ELISA test is sufficient for laboratory confirmation. In addition, repeat PRNT testing may not be performed if a patient has had a previous reactive PRNT test.

Indeterminate results for any of the WNV assays may be due to the presence of low-level antibodies or non-specific reactions. Therefore, as with all laboratory tests, the results should be interpreted in the context of the clinical history.

Note: During the summer season samples which are IgG positive and IgM negative will not be further tested by PRNT as this indicates a past flavivirus infection, more than several months ago. If further investigation of these samples is required please contact the Customer Service Centre and ask to speak to the microbiologist.

3. Update on recommended laboratory investigations and specimen requirements for cases of suspected West Nile Virus infection and cases with neurological involvement

For specimen requirements, in addition to clotted blood or serum acute and convalescent serology, submit a CSF sample for serological testing (WNV IgM), which is reactive in the majority of patients with WNV neuroinvasive disease. A positive CSF WNV IgM is sufficient for laboratory confirmation of CNS WNV infection.

Although WNV PCR testing is available, it is not considered a first line test as it is less sensitive than CSF IgM ELISA due to the brief viremia experienced in WNV infection. Please note that PCR testing is not required to confirm the diagnosis, and usually is not necessary. However, under special circumstances, the National Microbiology Laboratory (NML) can perform WNV PCR testing on patients with suspected neuroinvasive disease who are WNV IgM positive. Contact the Customer Service Centre and ask to speak to a microbiologist to request CSF PCR testing.

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West Nile Virus Update – Interpretation of serology results and investigation of cases with neurological involvement (Continued)

Table 1: Interpretation of WNV Laboratory Tests**

IgM ELISA	IgG ELISA	PRNT	Interpretation of WNV Tests
Non-reactive	Non-reactive	Not tested	No serological evidence of recent or past WNV infection.
Non-reactive	REACTIVE	Not tested	Probable past WNV and/or other flavivirus infection or vaccination against a non-WNV flavivirus (e.g. yellow fever and Japanese encephalitis virus). PRNT testing is not warranted.
REACTIVE or Indeterminate	REACTIVE	REACTIVE ≥1:40	Consistent with recent or past WNV infection. IgM antibodies may persist for >1 year at low levels and may be indicative of a previous infection.*
REACTIVE	Non-reactive or Indeterminate	REACTIVE ≥1:40	Consistent with recent or acute WNV infection. A follow-up serum sample in two weeks is recommended to demonstrate the development of IgG antibodies. The failure to develop IgG antibodies suggests possible cross-reactive antibodies from another flavivirus infection.
REACTIVE	Non-reactive or Indeterminate	Non-reactive or Indeterminate	Probable recent or acute WNV infection. A follow-up serum sample in two weeks is recommended to demonstrate the development of IgG antibodies. The failure to develop IgG antibodies suggests a non-specific IgM reaction.
REACTIVE	REACTIVE	Non-reactive	Probable recent or past WNVand/or other flavivirus infection or vaccination. A follow-up serum sample in two weeks is recommended, as well as consideration for testing for other flaviviruses, depending on the clinical history.*
Indeterminate	REACTIVE	Non-reactive or Indeterminate	Probable past flavivirus infection or vaccination. The IgG ELISA cannot differentiate between members of the Flavivirus genus. A follow-up serum sample in two weeks is recommended, as well as consideration for testing for other flaviviruses, depending on the clinical history.
Indeterminate	Indeterminate	Not tested	West Nile Virus antibody status inconclusive. A follow-up serum sample in two weeks is recommended. Persistent indeterminate results for WNV IgM and IgG antibodies suggest a non-specific reaction.

* Avidity testing may be considered in order to differentiate recent (last few months) from remote infections. This should only be considered in patients with severe illness (e.g. hospitalized).

** Once WNV activity is established in a health region, PRNT testing will no longer be performed for the remainder of the season.

West Nile Virus Update – Interpretation of serology results and investigation of cases with neurological involvement (Continued)

For further information:

- Contact the PHOL Customer Service Centre at 416-235-6556 or 1-877-604-4567 (toll-free) or by email at CustomerServiceCentre@oahpp.ca
- For the PHOL Specimen Collection Guide and previous Labstracts, refer to http://www.oahpp.ca/services/public-health-laboratories.html
- The current version of the PHO laboratory requisition form is available at http://www.oahpp.ca/resources/requisitions.html
- To subscribe to future Labstracts, email labstracts@oahpp.ca
- To register for Autofax and receive PHL reports by fax directly from our laboratory information system as soon as they are released, contact the PHOL Customer Service Centre.