# West Nile Virus Testing Guidelines for Healthcare Providers Wyoming Department of Health Preventive Health and Safety Division July 2009

#### **Indications for WNV Testing**

The diagnosis of WNV infection relies on a high index of clinical suspicion and on the results of specific laboratory tests. WNV or other arboviral diseases (Western Equine encephalitis, St. Louis encephalitis, etc.) should be seriously considered in patients who have onset of unexplained encephalitis or meningitis in summer or early fall. The local presence of WNV enzootic activity or other human cases should further raise the index of suspicion.

#### Testing for WNV is indicated when:

- There is evidence of clinically compatible illness during transmission season (May through October).
- WDH does NOT recommend testing of asymptomatic persons concerned about exposure

#### Availability of WNV Testing

In recent years, commercially available WNV diagnostic assays have been offered at an increasing number of commercial laboratories. Positive test results obtained using these assays help provide a presumptive diagnosis of WNV infection in patients with neuroinvasive disease; however, all positive results using these assays should be confirmed by further laboratory testing at a state health department or CDC. The Wyoming Public Health Laboratory offers <u>FREE</u> testing for WNV.

#### Testing for WNV at the WPHL:

- Serum samples will be tested Monday through Thursday. Serum samples received on Friday will be run on the following Monday as the test protocol indicates overnight incubation.
- CSF samples will be tested Monday through Friday.
- Expected turnaround time is approximately 48 hours.
- All CSF results will be phoned upon completion. Positive and borderline results for serum samples will be phoned upon completion. Negative serum results will be mailed upon completion.

#### **Ideal Timing for WNV Specimen Collection**

It is important to understand the ideal timing of specimen collection in order to optimize testing and interpretation of results. Improper timing of specimen collection may result in the patient needing to be re-tested.

- CSF specimens for IgM should be collected between **2 and 8 days post onset** of illness.
- Acute serum specimens should ideally be collected **8 days post onset of illness or** later.
- Convalescent specimens should be collected **2-3 weeks after collection of acute serum**.

Specimens should be transported on cold pack by overnight carrier or USPS ground. Submitters in Cheyenne can hand deliver samples to the WPHL (5<sup>th</sup> floor Hathaway Bldg) at room temperature. Please note that the submitter is responsible for all shipping costs.

### Diagnostic Testing for WNV and Interpretation of Results

#### Diagnostic testing

- IgM antibody-capture ELISA testing of CSF or serum is the most efficient diagnostic method
- A new diagnostic method may be implemented later this year called Luminex. It is a bead based technology which is a slightly different form of immunoassay that will give similar results as the traditional ELISA system (positive vs. negative). The Luminex bead system is compatible with both serum and CSF samples but is easier to work with and takes less time to perform.
- Since IgM antibody does not cross the blood-brain barrier, IgM antibody in CSF strongly suggests central nervous system infection
- False positive IgMs can be seen in patients recently vaccinated against or recently infected with related flaviviruses (yellow fever, Japanese encephalitis, dengue). Neutralization assays (plaque reduction neutralization tests) are more specific and should be considered if any of these other infections are suspected.
- Serum IgM anti-WNV antibody may possibly persist for more than 12 months in some persons. Therefore, in areas where WNV has circulated in the recent past, the co-existence of WNV IgM and illness in a given person may be coincidental and unrelated. Thorough clinical correlation is therefore required. If there is doubt if WNV is causing the current illness, despite the presence of IgM, two serially collected serum specimens 2-3 weeks apart should be considered.

#### Laboratory criteria for diagnosis

 Virus-specific IgM antibodies demonstrated in CSF or serum by antibodycapture enzyme immunoassay, <u>OR</u>

- Isolation of virus from or demonstration of specific viral antigen, <u>OR</u> genomic sequences in tissue, blood, CSF, or other body fluid, <u>OR</u>
- Fourfold or greater change in virus-specific serum antibody titer

#### Other testing issues

- For those tests where IgM is negative, borderline, or indeterminate <u>and</u> the specimen was collected more than **60 days post onset** of symptoms, the specimen will automatically be referred to IgG testing. IgG tests will be batched-reflexed and turnaround time for test results may be increased.
- If the clinician believes that the laboratory results do not fit with the clinical picture of illness, the clinician may contact Dr. Tracy Murphy, State Epidemiologist, at (307) 777-7716 to discuss further options for testing and differential diagnoses.

For additional information on WNV testing, visit the WPHL website at: <a href="http://wdh.state.wy.us/phsd/lab/wphlwnv.html">http://wdh.state.wy.us/phsd/lab/wphlwnv.html</a> or call the

Wyoming Public Health Laboratory: During business hours: (307) 777-7431 Emergencies after hours: 1-888-996-9104

#### **Reporting WNV Cases to WDH**

West Nile virus is a reportable disease in Wyoming. Please report all cases of confirmed and suspected West Nile virus infections (fever, encephalitis, meningitis, WNV-associated flaccid paralysis) to the Wyoming Department of Health. Rapid reporting of cases to the health department is essential to guide public health control efforts. Future funding for mosquito control efforts may depend on accurate reporting of human cases that are considered a reflection of WNV activity in the area.

When reporting, please be sure to indicate the manifestation of the West Nile virus infection by specifying the following:

- <u>Asymptomatic blood donor:</u> confirmed viremic blood donor who does not develop a compatible illness within two weeks of the positive donation.
- West Nile non-neuroinvasive disease (with or without fever): mild to moderate illness without clinical or laboratory evidence of central nervous system involvement, and with a positive IgM in serum. If a case is originally reported as West Nile non-neuroinvasive disease and progresses to West Nile neuroinvasive disease, please submit an updated report.
- <u>WNV meningitis</u>: physician diagnosis of meningitis or abnormal CSF findings consistent with viral meningitis, and a positive IgM in serum or CSF, characterized by fever, headache, stiff neck, and pleocytosis.
- <u>WNV encephalitis</u>: physician diagnosis of encephalitis and clinical presentation of encephalitis characterized by fever, headache, and altered mental status

- ranging from confusion to coma with or without additional signs of brain dysfunction (e.g. paresis, paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, or abnormal movements), and a positive IgM in serum or CSF.
- <u>WNV-associated flaccid paralysis:</u> physician diagnosis of acute flaccid paralysis and/or respiratory paralysis syndrome with or without additional symptoms and a positive IgM in serum or CSF.

If the patient is pregnant, breast-feeding, or has donated blood in the last two weeks, this should be indicated on the report.

#### SEND REPORTS TO THE EPIDEMIOLOGY SECTION BY FAX OR PHONE:

FAX: (307) 777-5573 PHONE: (307) 777-8634

TOLL-FREE: 1-877-996-9000 (during business hours)

1-888-996-9104 (emergencies after hours)

#### **Additional Resources**

- The Wyoming Department of Health's West Nile website: www.badskeeter.org
- The Wyoming Public Health Laboratory's West Nile website: http://wdh.state.wy.us/lab/WPHL-WNV.asp
- The Centers for Disease Control and Prevention's West Nile website: http://www.cdc.gov/ncidod/dvbid/westnile/index.htm
- The National Pesticide Information Center's website: http://npic.orst.edu/index.html

## Summary of 2008 WNV Activity by County

2008 Wyoming West Nile Human Detections by County		
County	Positives	Deaths
Albany	0	0
Big Horn	0	0
Campbell	0	0
Carbon	0	0
Converse	0	0
Crook	0	0
Fremont	4	0
Goshen	3	0
Hot Springs	0	0
Johnson	0	0
Laramie	1	0
Lincoln	0	0
Natrona	0	0
Niobrara	0	0
Park	0	0
Platte	2	0
Sheridan	0	0
Sublette	0	0
Sweetwater	0	0
Teton	0	0
Uinta	0	0
Washakie	0	0
Weston	0	0
TOTAL	10*	0

<sup>\*</sup>includes fever and encephalitis cases