



# New Hampshire Health Alert Network

## Health.Alert@nh.gov

**Status:** Actual  
**Message Type:** Alert  
**Severity:** Moderate  
**Sensitive:** Not Sensitive  
**Message Identifier:** NH-HAN #20120618 Arboviral Disease in New Hampshire  
**Delivery Time:** 12 hours  
**Acknowledgement:** No  
**Originating Agency:** NH Department of Health and Human Services, Division of Public Health Services

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**DATE:** June 17, 2013                      **TIME:** 10:00 EDT  
**TO:** Physicians, Nurse, Infection Control Practitioners, Hospital Emergency Departments, Manchester Health Department, Nashua Health Department, DHHS Outbreak Team, DPHS Investigation Team, NHHA, Public Health Network, Zoonotic Alert Team, DPHS Management Team, NH Health Officers, MMRS, and MRC  
**FROM:** Jodie Dionne-Odom, MD, Deputy State Epidemiologist  
**SUBJECT:** Arboviral Disease in New Hampshire – Preparation for the 2013 Season

### **NH Department of Health and Human Services (NH DHHS) recommends:**

1. Vigilance is needed during the summer months to consider mosquito-borne diseases, including West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE), in patients with compatible clinical features. Laboratory testing is recommended and may be arranged by calling (603) 271-4496 during business hours or (603) 271-5300 after hours. Forms and human testing information are available at <http://www.dhhs.state.nh.us/dphs/cdcs/arboviral/index.htm>.
2. Remind patients to take preventive measures, including avoiding mosquito bites by use of protective clothing and insect repellents, and environmental reduction of mosquito populations.
3. Equine vaccines are available for both EEE and WNV and should be used to protect horses. Vaccines are not available for human use.
4. Report all arboviral illnesses, confirmed or suspected, to the Division of Public Health Services (DPHS) within 24 hours at 603-271-4496 (after hours 1-800-852-3345, x5300).

### **Background**

Arboviruses in NH include West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) virus, both transmitted to humans through the bite of an infected mosquito. The viruses are maintained in a bird-mosquito cycle with humans considered incidental hosts. The time of highest risk for human infection in NH has been identified between July and October. Year-round transmission is possible in some geographic locations in the U.S.

Nationally last season (2012), there were 5,674 human cases of WNV reported in the US, including 286 deaths. Neuroinvasive Disease (meningitis and/or encephalitis) was recorded in 2,873 cases, while 2,801 cases were diagnosed with milder West Nile fever. There were 15 human cases of EEE reported in the US.

In NH during the 2012 season, there were 41 WNV-positive mosquito batches and one human with neuroinvasive WNV disease with no veterinary cases. There were nine EEE-positive mosquito batches and four EEE positive animals. No human cases of EEE were reported; the last NH EEE human case was reported in 2009.

### **When to Suspect Arboviral Illness**

The incubation period following the bite of an infected mosquito ranges from 3 to 14 days. Most arboviral infections are mild and non-apparent. Mild forms of disease normally present as a febrile illness but sudden onset of symptoms can be seen with headache, myalgias and arthralgias. Approximately 20% of those infected with WNV develop a mild illness known as West Nile Fever.

The more severe forms of arboviral infection include altered mental status and/or neurological dysfunction (cranial and peripheral neuritis or other neuropathies, including acute flaccid paralysis syndrome). A minority of patients with severe disease develop a diffuse maculopapular or morbilliform rash. Approximately 1 in 150 WNV infections will result in severe neurological disease with encephalitis more common than meningitis. Older patients are at additional risk of developing severe West Nile Virus infections. For EEE, approximately one-third of all people who develop clinical encephalitis will die from the disease. Among those who recover, many suffer from permanent brain damage and severe disease can be seen in any age group, including children.

The typical laboratory findings are normal or elevated total leukocyte counts, lymphocytopenia and anemia, and hyponatremia in peripheral blood. Examination of cerebrospinal fluid (CSF) shows pleocytosis (usually with a predominance of lymphocytes), elevated protein, and normal glucose levels. For about one-third of WNV patients, magnetic resonance imaging (MRI) shows enhancement of the leptomeninges, the periventricular areas, or both, while MRI of EEE patients often reveal abnormalities of the basal ganglia and thalami.

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

### **When to Report Suspected Cases of Arboviral Illness**

Clinicians, hospitals, and laboratories should report within 24 hours any patient meeting the following criteria:

1. Any patient with encephalitis or meningitis from July through November, who meet criteria a, b and c below without an alternative diagnosis:

- a. Fever  $\geq$  38.0 C or 100 F, and
- b. CNS involvement including altered mental status (altered level of consciousness, confusion, agitation, lethargy) and/or other evidence of cortical involvement (e.g., focal neurologic findings, seizures), and
- c. Abnormal CSF profile suggesting a viral etiology (a negative bacterial stain and culture) showing pleocytosis with predominance of lymphocytes. Elevated protein and normal glucose levels.

### **How to Report Suspect Cases of Arboviral Illness**

All suspected arboviral cases should first be reported to the New Hampshire Division of Public Health Services by telephone. A completed case report form (attached) must be faxed to the NH Infectious Disease Investigation Section (603-271-0545) *and* a copy submitted with the laboratory specimen(s) to the NH Public Health Laboratories. DPHS staff members are available 24/7 to help determine if the clinical presentation meets the case criteria for viral meningoencephalitis and whether further testing would be appropriate. Specimen submission guidelines are attached as well.

For additional information on arboviral illness and maps of recent activity, please visit the NH DHHS website at <http://www.dhhs.nh.gov/dphs/cdcs/arboviral/results.htm>. For fact sheets on WNV and EEE, go to <http://www.dhhs.nh.gov/dphs/cdcs/arboviral/publications.htm>

A toll free information line is also available for the public during the summer months: 1-866-273-NILE (6453).

### **Attachments:**

- 1) NH Arboviral Case Report Form
- 2) Laboratory Submission Guidelines for Arboviral Testing

### **For additional information on WNV and EEE please refer to:**

1. Our toll free information line: 1-866-273-NILE (6453)
2. Our website: <http://www.dhhs.nh.gov/dphs/cdcs/arboviral/index.htm>
3. The Centers for Disease Control, Division of Vector-Borne Infectious Diseases website at: <http://www.cdc.gov/ncidod/dvbid/westnile/clinicians/>.

If you or other health care providers have questions, please call Bureau of Infectious Disease Control at (603) 271-4496 or 1-800-852-3345, extension 4496 during business hours (8 am to 4:30 pm). Nights or weekends call the New Hampshire Hospital switchboard at 1-800-852-3345 extension 5300 and request the Public Health Professional on-call.

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## DEFINITION OF TERMS AND ALERTING VOCABULARY

### Message Type

- Alert: Indicates an original alert
- Update: Indicates prior alert has been updated and superseded
- Cancel: Indicates prior alert has been cancelled
- Error: Indicates prior alert has been retracted

### Status

- Actual: Communication or alert refers to a live event
- Exercise: Designated recipients must respond to the communication or alert
- Test: Communication or alert is related to a technical, system test and should be disregarded

### Severity

- Extreme: Extraordinary threat to life or property
- Severe: Significant threat to life or property
- Moderate: Possible threat to life or property
- Minor: Minimal threat to life or property
- Unknown: Unknown threat to life or property

### Sensitive

- Sensitive: Indicates the alert contains sensitive content
- Not Sensitive: Indicates non-sensitive content

**Message Identifier:** A unique alert identifier that is generated upon alert activation.

**Delivery Time:** Indicates the timeframe for delivery of the alert.

**Acknowledgement:** Indicates whether an acknowledgement on the part of the recipient is required to confirm that the alert was received, and the timeframe in which a response is required.

**Originating Agency:** A guaranteed unique identifier for the agency originating the alert.

**Alerting Program:** The program sending the alert or engaging in alerts and communications using PHIN Communication and Alerting (PCA) as a vehicle for their delivery.

**You have received this message based upon the information contained within our emergency notification database.**

**If you have a different or additional e-mail or fax address that you would prefer to be used please contact:**

Denise M. Krol, MS  
NH HAN Coordinator  
[Denise.Krol@dhhs.state.nh.us](mailto:Denise.Krol@dhhs.state.nh.us)

**Business Hours 8:00 AM – 4:00 PM**  
Tel: 603-271-4596  
Fax: 603-271-0545



STATE OF NEW HAMPSHIRE  
DEPARTMENT OF HEALTH AND HUMAN SERVICES



Nicholas A. Toumpas  
Commissioner

29 HAZEN DRIVE, CONCORD, NH 03301-6527  
603-271-4496 1-800-852-3345 Ext. 4496  
Fax: 603-271-0545 TDD Access: 1-800-735-2964

José Thier Montero  
Director

NH Public Health Laboratories

**How to Collect and Submit Clinical Specimens for Arboviral Testing**

All suspect arbovirus cases should be reported to the Communicable Disease Control Section at 1-800-852-3345, ext. 4496 or the Public Health Laboratories at (603) 271-4661 before specimens are submitted.

**Diagnostic testing:** The arboviral testing panel is a serological test for West Nile virus (WNV), Eastern Equine Encephalitis virus (EEE), St. Louis Encephalitis virus (SLE), and may include Powassan virus (depending on availability of reagents).

- The most efficient diagnostic method measures IgM antibodies in CSF or serum collected within 8 days of illness onset. The PHL uses the Microsphere Immunoassay (MIA) for detection of IgM antibody.
- Since the MIA is a preliminary test, Plaque Reduction Neutralization test (PRNT) is required for case confirmation.
- The IgM antibody does not cross the blood-brain barrier; IgM antibody in CSF strongly suggests central nervous system infection.
- Serologic tests have a lower sensitivity due to cross-reactivity to related flaviviruses (e.g., yellow fever, Japanese encephalitis, dengue) and the persistence of WNV IgM antibodies in serum for 6 months or longer after infection.

**Fee Schedule:**

TEST	CPT
Eastern Equine Encephalitis (EEE) virus antibodies, IgM	86652
St. Louis Encephalitis virus antibodies, IgM	86653
West Nile Virus (WNV) antibodies, IgM	86788

All specimens submitted to the Public Health Laboratories will be screened for EEE, SLE, and WNV.

**The Total Cost Per Screen is \$105.00.**

**Note: All spinal fluid submissions must be accompanied by a corresponding serum sample. There will be only a single charge for the paired specimens.**

**Specimens:**

**Cerebrospinal fluid (CSF):** As early as the first few days of illness, IgM antibody can be demonstrated in CSF by MIA.

Since other viruses can cause encephalitis, culture for additional viruses (other arboviruses, enteroviruses, and herpesviruses) may be performed at the discretion of the laboratory.

Submit 2-5 ml in sterile, empty, screw-capped container.

- **Serum:** Acute serum (3ml) should be collected and sent immediately to PHL for testing. Serum will be tested for IgM arboviral antibody. If specimen is IgM positive, then a convalescent specimen will be requested to determine the timing of infection.

**Ideal timing of specimens for serology:**

Specimen	Timing
Acute	3 to 10 days after onset of symptoms
Convalescent	2-3 weeks after acute sample

**All spinal fluid submissions must be accompanied by a corresponding serum sample.**

The following information is critical for accurate interpretation of test results and should be recorded on the accompanying case report form:

- **Date of onset of disease symptoms**
- Date of specimen collection
- Unusual immunological status of patient (e.g. immunosuppression)
- Brief clinical summary including suspected diagnosis (e.g., encephalitis or meningoencephalitis)
- Current address and travel history to flavivirus-endemic areas
- History of prior vaccination against flavivirus disease (e.g., yellow fever, Japanese encephalitis, or Central European encephalitis)
- Disease history (e.g., previous history of viral encephalitis or Dengue fever)

**Procedure for submission of serum or CSF:**

1. Perform lumbar puncture or venipuncture (SST or whole blood tube) by standard aseptic technique.
2. Label the specimen tubes with patient's full name and the date of collection.
3. If possible, centrifuge blood to separate serum.
4. For CSF, tightly seal cap and then wrap parafilm around seal to provide additional protection from leakage during transport.
5. Fill out requisition form completely, being sure to request "Arbovirus IgM"
6. Place CSF inside zip-lock biohazard bag and seal.
7. Place blood tube inside inner metal liner. Be sure there is enough absorbent material to cushion tubes in transit or to absorb liquid in case of leaking or broken tubes. Cap liner tightly.
8. Wrap the requisition form around the OUTSIDE of the inner metal liner.
9. Insert the metal liner into the outer cardboard container, and cap tightly. Make certain that the mailing container is labeled with the name and address of the NH PHL.
10. Mail first class or hand/courier deliver to the PHL. For emergency pickup after hours, contact the PHL at 1-800-852-3345. Refrigerate at 2-8° C if it is not possible to send specimen immediately.

The arboviral collection kit consists of:

- ❖ A labeled cardboard outer mailing container
- ❖ An aluminum inner liner
- ❖ An SST vacutainer blood collection tube
- ❖ A polypropylene tube and parafilm for transport of CSF
- ❖ Absorbent material
- ❖ Requisition form

**To order specimen collection kits, please call 271-4661, or 1-800-852-3345, extension 4661. For further technical information regarding diagnostic testing, please call Denise Bolton, at 271-3684, or 1-800-852-3345, extension 3684.**

**New Hampshire Case Report  
Arboviral Infection  
Encephalitis/Meningitis**

**This form must be faxed to the New Hampshire Communicable Disease Control Section (603-271-0545) and a copy submitted with the laboratory specimen(s) to the NH Public Health Laboratories**

**PATIENT INFORMATION**

Name: \_\_\_\_\_ Date of Birth: \_\_\_\_/\_\_\_\_/\_\_\_\_  Male  Female  
Last First MI mm dd yy

Home Address: \_\_\_\_\_ Homeless  Yes  No  
Street City State Zip

Phone (H) \_\_\_\_\_ (W) \_\_\_\_\_ (Cell) \_\_\_\_\_

RACE  White  Black/African American  Asian  Native Hawaiian/Pacific Islander  American Indian/Alaska Native  Unknown  
 ETHNICITY  Unknown  Hispanic  Non-Hispanic

**CLINICAL INFORMATION**

Current Diagnosis:  Encephalitis  Meningitis  Other \_\_\_\_\_

Hospitalized?  Yes  No If yes, Hospital: \_\_\_\_\_

Date of Admission: \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of Discharge/Transfer: \_\_\_\_/\_\_\_\_/\_\_\_\_

Physician/Provider: \_\_\_\_\_ Phone: \_\_\_\_\_

**SYMPTOMS:** Date of first symptoms \_\_\_\_/\_\_\_\_/\_\_\_\_ Date of first *neurologic* symptoms \_\_\_\_/\_\_\_\_/\_\_\_\_

	YES	NO	UNK		YES	NO	UNK		YES	NO	UNK
Fever $\geq 100^{\circ}\text{F}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disorientation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Convulsions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Highest Temp (if known) _____ <sup>°F</sup>				Delirium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paralysis/Paresis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Headache	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lethargy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acute Flaccid Paralysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stiff Neck	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stupor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cranial Nerve Palsy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tremor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Coma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vomiting/Nausea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Muscle Weakness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location of Rash			
Diarrhea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hyperreflexia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hemorrhage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confusion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Muscle Pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Joint Pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seizures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rigidity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Other _____											

OUTCOME  Recovered  Residual Symptoms  Died  Unknown If patient died, date of death \_\_\_\_/\_\_\_\_/\_\_\_\_

**LABORATORY INFORMATION/TEST RESULTS (attach laboratory sheets)**

Acute specimens (serum or CSF) must be collected within 3 to 10 days after onset of symptoms. Convalescent specimens should be collected 2-3 weeks after acute sample. If CSF is collected and submitted, please include serum sample.

CSF (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Abnormal?  Yes  No  Unknown Glu \_\_\_\_\_ Prot \_\_\_\_\_ RBC \_\_\_\_\_

WBC \_\_\_\_\_ Diff. Segs% \_\_\_\_\_ Lymphs% \_\_\_\_\_ Gram stain \_\_\_\_\_ Bacterial Culture \_\_\_\_\_

Fungal/Parasitic tests \_\_\_\_\_ Viral test results (Culture/Serology/PCR) \_\_\_\_\_

CBC (specify units) Date \_\_\_\_/\_\_\_\_/\_\_\_\_ WBC \_\_\_\_\_ Diff.Segs% \_\_\_\_\_ Lymphs% \_\_\_\_\_

MRI Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_

CT Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_

EMG Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Result \_\_\_\_\_

**ANTIVIRAL TREATMENT**  Yes  No  Unk If Yes, list below. **Date Started** \_\_\_\_/\_\_\_\_/\_\_\_\_

**RISK FACTOR INFORMATION FOR PRELIMINARY OR CONFIRMED POSITIVE CASES OF ARBOVIRAL ILLNESS**

Patient Name: \_\_\_\_\_ DOB: \_\_\_/\_\_\_/\_\_\_

1. Does the patient's residence have screened windows? Yes No Unknown
2. During the two weeks before onset of illness does the patient recall being bitten by mosquitoes?  
Yes No If yes, dates and places \_\_\_\_\_
3. Is the patient a smoker? Yes No Unknown  
 If yes, do they smoke outdoors? Yes No Unknown
4. On average, how much time has the patient spent outdoors each day in the two weeks prior to onset? \_\_\_\_\_  
 List any unusually long periods spent outside during the two weeks prior to onset: \_\_\_\_\_
5. Does the patient use any prevention measures to avoid mosquito bites? Yes No Unknown  
 If yes, list \_\_\_\_\_  
 Does the patient use mosquito repellent when outdoors: Always Sometimes Rarely Never  
 Does the repellent contain DEET (N, N-diethyl-meta-toluamide, or N, Ndiethyl-3-methylbenzamide), Picaridin, or Oil of Lemon Eucalyptus? Yes No Unknown
6. During the two weeks before onset did the patient travel outside the county of residence?  
Yes No Unknown If yes, specify when and where: \_\_\_\_\_
7. Has the patient traveled outside of New Hampshire in the two weeks prior to onset? Yes No Unknown  
 If yes, specify when and where: \_\_\_\_\_
8. Has the patient traveled outside the U.S. in the two weeks prior to onset? Yes No Unknown  
 If yes, specify when and where: \_\_\_\_\_
9. Does the patient have any underlying medical conditions? Yes No Unknown  
 If yes, specify: \_\_\_\_\_
10. What is the patient's occupation? \_\_\_\_\_

**BLOOD DONATION/TRANSFUSION/TRANSPLANT HISTORY/PREGNANCY**

11. Has the patient received an organ transplant or blood product transfusion in the month prior to onset?  
Yes No Unknown  
 If yes, specify when and where: \_\_\_\_\_
12. Has patient donated blood products or been a living organ donor in the one month prior to onset? Yes No Unknown
13. Is the patient currently pregnant? Yes No Unknown Not applicable  
 If yes, weeks pregnant \_\_\_\_\_ due date \_\_\_/\_\_\_/\_\_\_
14. Is the patient breastfeeding or planning to breastfeed? Yes No Unknown

**COMMENTS:** \_\_\_\_\_  
 \_\_\_\_\_

**REPORTED BY:** \_\_\_\_\_ **DATE OF REPORT:** \_\_\_/\_\_\_/\_\_\_

Last Name \_\_\_\_\_ First Name \_\_\_\_\_ Title(ICN, Resident, Attending) \_\_\_\_\_

Work address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone \_\_\_\_\_ Pager \_\_\_\_\_

**FOR DHHS USE:**

Initial Report Taken by: \_\_\_\_\_ Report Completed by: \_\_\_\_\_

Case Status: Confirmed Probable Not a Case Unknown Other State