

# THIS IS AN OFFICIAL NH DHHS HEALTH ALERT

Distributed by the NH Health Alert Network  
[Health.Alert@dhhs.nh.gov](mailto:Health.Alert@dhhs.nh.gov)  
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NH-HAN 20170616



## Mosquito-borne Diseases in New Hampshire 2017

### Key Points and Recommendations:

1. Be vigilant during the summer months to consider mosquito-borne diseases, including West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE), among patients with compatible clinical features.
2. Remind patients to avoid mosquito bites by use of insect repellents and wearing protective clothing, and environmental reduction of mosquito populations.
3. Laboratory confirmation of WNV and EEE can 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>.
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, 603-271-5300).

### Background

Mosquito-borne diseases transmitted in New Hampshire include West Nile virus (WNV) and Eastern Equine Encephalitis (EEE) virus, both transmitted to humans through the bite of an infected mosquito. In 2013, the first human case of locally-acquired Jamestown Canyon virus (JCV) was also identified. EEE and WNV are maintained in a bird-mosquito cycle with humans considered incidental hosts. JCV is maintained in a deer-mosquito cycle, and reports of human illness are rare. The greatest risk for human acquisition of mosquito-borne diseases in NH is between July and October. Year-round transmission is possible in some geographic locations in the US.

Nationally during the last mosquito season (2016), there were 2,038 human cases of WNV reported, including 94 deaths. Neuroinvasive WNV disease (meningitis and/or encephalitis) was recorded in 1,140 cases, while 898 cases were diagnosed with milder WNV disease. There were also 6 human cases of EEE reported in the US. In NH, for WNV there was one positive mosquito batch, no veterinary cases, and no human cases. For EEE, there were no positive identifications.

While not transmitted locally in NH, Zika virus, chikungunya virus (CHIKV), and other mosquito-borne diseases are possible among travelers returning from endemic regions. As of June 15, 2017, a total of 14 travel-associated cases of Zika virus infection have been identified in NH since January 2016. The Centers for Disease Control and Prevention reported in 2016 that the Zika virus mosquito vectors (*Aedes aegypti* and *Aedes albopictus*) were detected in NH in the past; however, NH DPHS has not verified these detections and does not have evidence that there are sustained populations of these mosquitoes. NH DPHS will enhance efforts to detect these mosquitoes by deploying additional traps specific for catching these species of mosquitoes during the 2017 season. At this time, local transmission of Zika virus by mosquitoes is extremely unlikely. Additional Zika virus information, including the most recent Zika virus HAN can be found here: <http://www.dhhs.nh.gov/dphs/cdcs/zika/index.htm>.

## Signs and Symptoms

The incubation period for WNV following the bite of an infected mosquito ranges from 2 to 14 days, and the incubation period for EEE ranges from 4 to 10 days. An estimated 70-80% of human WNV infections are subclinical or asymptomatic. Most symptomatic persons experience an acute systemic febrile illness that often includes headache, weakness, myalgia, or arthralgia. Less than 1% of infected persons develop neuroinvasive disease, which typically manifests as meningitis, encephalitis, or acute flaccid paralysis. For EEE, approximately one-third of individuals infected will develop severe encephalitis and die from the disease. Among those who recover, many suffer from permanent brain damage. Severe disease can be seen in any age group, including children.

Treatment is supportive, such as intravenous fluids, respiratory support, and prevention of secondary infections for patients with severe disease.

## When to Report Suspected Cases of Mosquito-borne 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 Mosquito-borne Illness

All suspected mosquito-borne disease 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 (PHL). DPHS staff members are available 24/7 to help determine if the clinical presentation meets the case criteria and whether further testing would be appropriate. Specimen submission guidelines are attached.

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>

## Laboratory Testing for Mosquito-borne Illnesses

Laboratory diagnosis of mosquito-borne infections is generally accomplished by testing serum and/or cerebrospinal fluid (CSF) for virus-specific IgM and neutralizing antibodies. The NH Public Health Laboratory (PHL) can test for EEE, WNV and St. Louis encephalitis (SLE) IgM. Positive IgM results are sent to CDC for confirmatory testing.

The PHL can also test for Zika (IgM and viral RNA), CHIKV (PCR) and dengue (PCR). Please consult the Bureau of Infectious Disease Control at 603-271-4496 prior to sending specimens to the PHL for these tests.

For more information, including specimen collection instructions, please refer to:  
<http://www.dhhs.nh.gov/dphs/cdcs/arboviral/documents/arboguidelines.pdf>

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

1. The NH DHHS website at: <http://www.dhhs.nh.gov/dphs/cdcs/arboviral/index.htm>
2. The Centers for Disease Control, Division of Vector-Borne Infectious Diseases websites at:
  - <http://www.cdc.gov/ncidod/dvbid/westnile/clinicians/>
  - <https://www.cdc.gov/easternequineencephalitis/index.html>

For questions, please call Bureau of Infectious Disease Control at (603) 271-4496 during business hours (8 am to 4:30 pm). Nights or weekends call the New Hampshire Hospital switchboard at 603-271-5300 and request the Public Health Professional on-call.

To change your contact information in the NH Health Alert Network, contact Thom Flynn at 603-271-7499 or email [thomas.flynn@dhhs.nh.gov](mailto:thomas.flynn@dhhs.nh.gov).

Status: Actual  
Message Type: Alert  
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Distributed to: Physicians, Physician Assistants, Practice Managers, Infection Control Practitioners, Infectious Disease Specialists, Community Health Centers, Hospital CEOs, Hospital Emergency Departments, Nurses, NHHA, Pharmacists, Laboratory Response Network, Manchester Health Department, Nashua Health Department, Public Health Networks, DHHS Outbreak Team, DPHS Investigation Team, DPHS Management Team, Northeast State Epidemiologists, Zoonotic Alert Team, Health Officers, Deputy Health Officers, MRC, NH Schools, EWIDS  
From: Benjamin P. Chan, MD, MPH, State Epidemiologist  
Originating Agency: NH Department of Health and Human Services, Division of Public Health Services

**Attachments:**

- 1) NH Arboviral Case Report Form

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**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

**Prior to submission of suspect Chikungunya virus specimens for testing, a Public Health Nurse at the Bureau of Infectious Disease Control must be consulted in order to avoid a testing fee.**

Please indicate the nurse contacted for tracking purposes: \_\_\_\_\_

**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) _____ $^{\circ}\text{F}$				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