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NH DIVISION OF Public Health Services
Improving health, preventing disease, reducing costs *for all*
Department of Health and Human Services

Update on Chikungunya Virus Activity

NH Division of Public Health Services (NH DPHS) recommends:

1. Awareness of chikungunya virus activity nationally and in NH.
2. Consider chikungunya virus diagnoses in clinically compatible patients.
3. Remind patients traveling to Caribbean and other affected areas to take preventive measures, including avoiding mosquito bites by use of protective clothing and insect repellents.
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:

The first identified cases of chikungunya virus (CHIKV) infection have been identified in New Hampshire in two people who traveled to the Caribbean, which is currently experiencing a large outbreak of this virus. These patients cannot spread CHIKV to other people in New Hampshire because the mosquito species that are capable of transmitting CHIKV have not been identified in this area.

Epidemiology:

CHIKV infection is transmitted by mosquitoes and was first reported in East Africa in the 1950s. The name *chikungunya* comes from the Kimakonde language and means “that which contorts or bends up". This name was derived from descriptions of patients who assumed a typical stooped posture because of the severe arthritic symptoms. Like dengue, *A. aegypti* is the main vector with some transmission by *A. albopictus*. Global trade and migration have facilitated the spread of this virus from Africa to India through the islands of the Indian Ocean, and then onward throughout Southeast Asia, in a northern region of Italy, areas of South and Central America, and the Caribbean. There has not been any local transmission reported in the continental United States.

Clinical Features:

Asymptomatic infection occurs in 3% to 25% of infected individuals. Patients who are symptomatic usually have the sudden onset of fever, debilitating polyarthralgias, and maculopapular rash involving the trunk and extremities but which may also extend to the face, palms, or soles. Other symptoms may include headache, myalgia, arthritis, conjunctivitis, and nausea/vomiting. Patients may exhibit lymphopenia, thrombocytopenia, elevated creatinine, and elevated hepatic transaminases.

In fact, differentiation between dengue and CHIKV infection can be challenging because of their overlapping presentations and common vectors. Unlike with dengue, anti-inflammatory agents can be used in CHIKV infection and are particularly helpful for the arthritis and arthralgias.

Acute symptoms typically resolve within 7–10 days. Some patients have relapse of rheumatologic symptoms for months to years. Mortality is rare and occurs mostly in older adults.

When to Suspect Chikungunya

CHIKV infection should be considered in patients with acute onset fever and polyarthralgia who report recent relevant travel. The incubation period following the bite of an infected mosquito is typically 3-7 days. Due to similarities between symptoms and geographic distribution, patients with suspected CHIKV infection should also be evaluated for infection with dengue virus.

All suspected arboviral infections, including chikungunya, should be reported to the New Hampshire Division of Public Health Services within 24 hours at 603-271-4496 (after hours 1-800-852-3345, x5300). DPHS staff members are available 24/7 to discuss clinical presentation and whether further testing is appropriate.

Prevention

The best way to prevent infection with CHIKV is through avoidance of mosquito bites. There is no vaccine or preventative treatment. Travelers to areas where CHIKV transmission has been documented should take precautions to prevent being bitten by mosquitoes, including wearing long sleeves and pants and using insect repellents when outdoors, and using air conditioning or screens when indoors. The vectors responsible for CHIKV transmission are not found in New Hampshire, but are established in other parts of the United States. Patients who are infected with CHIKV should take all precautions to avoid mosquito bites for the duration of their illness.

Treatment

There is no antiviral treatment for CHIKV infection. Treatment is symptomatic and can include rest, fluids, analgesics and antipyretics.

Diagnosis

CHIKV laboratory diagnosis is accomplished by testing serum to detect either viral nucleic acid (RNA) or virus-specific immunoglobulin (Ig) M and neutralizing antibodies. During the first 8 days of illness, chikungunya viral RNA can often be identified in serum. CHIKV antibodies normally develop toward the end of the first week of illness. Therefore, to definitively rule out the diagnosis, convalescent-phase samples should be obtained from patients whose acute-phase samples test negative.

The appropriate diagnostic sample is serum (SST tube is ideal), which should be collected as acute within the first eight days of illness and convalescent, 10–14 days after acute specimen collection.

To transport samples to the New Hampshire Public Health Laboratories (PHL):
• Transport at 2°–8°C (cold pack) as soon as possible.
• Do not freeze whole blood, because hemolysis may interfere with serology test results.
• If a delay greater than 24 hours is expected before specimens can be submitted to the laboratory, the serum should be separated and stored at refrigerated temperature.

Please include the following information on the NH PHL requisition (found here: http://www.dhhs.nh.gov/dphs/lab/documents/labrequisition.pdf):
1. Date of onset of symptoms
2. Date of specimen collection NOTE: If the specimen collection occurs within 8 days after the onset of symptoms, a convalescent specimen will be requested.
3. Any pertinent travel history (3 months prior to the date of symptom onset)
4. The patient's name (REQUIRED for submitting specimens)

Lab Testing & Expected Results

Days post illness onset	Virus testing	Antibody testing
Day 1-3	RT-PCR = Positive	IgM = Negative PRNT = Negative
Day 4-8	RT-PCR = Positive	IgM = Positive PRNT = Negative
> Day 8	RT-PCR = Negative	IgM = Positive PRNT = Positive

This testing is currently performed at the CDC. Please contact Denise Bolton at the PHL (271-3684) for more information and to facilitate testing. At this time, Focus Diagnostics is the only commercial laboratory able to perform diagnostic testing in the United States.

Additional information is available at the Centers for Disease Control and Prevention website at: http://www.cdc.gov/chikungunya/

For any questions regarding the contents of this message, please contact NH DHHS, DPHS, Bureau of Infectious Disease Control at 603-271-4496 (after hours 1-800-852-3345 ext.5300).

To change your contact information in the NH Health Alert Network, contact Denise Krol at 603-271-4596 or email Denise.Krol@dhhs.state.nh.us

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From:	Elizabeth A. Talbot, MD – Deputy State Epidemiologist
Originating Agency:	NH Department of Health and Human Services, Division of Public Health Services

Attachments:
1. NH Arboviral Case Report Form
2. CDC Clinician Fact Sheet

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 ≥100 °F	☐	☐	☐	Disorientation	☐	☐	☐	Convulsions	☐	☐	☐
Highest Temp (if known)	_____ °F			Delirium	☐	☐	☐	Paralysis/ Paresis	☐	☐	☐
Headache	☐	☐	☐	Lethargy	☐	☐	☐	Acute Flaccid Paralysis	☐	☐	☐
Stiff Neck	☐	☐	☐	Stupor	☐	☐	☐	Cranial Nerve Palsy	☐	☐	☐
Tremor	☐	☐	☐	Coma	☐	☐	☐	Rash	☐	☐	☐
Vomiting/ Nausea	☐	☐	☐	Muscle Weakness	☐	☐	☐	Location of Rash	_____		
Diarrhea	☐	☐	☐	Hyperreflexia	☐	☐	☐	Hemorrhage	☐	☐	☐
Confusion	☐	☐	☐	Muscle Pain	☐	☐	☐	Joint Pain	☐	☐	☐
Seizures	☐	☐	☐	Rigidity	☐	☐	☐				

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

CHIKUNGUNYA

Information for healthcare providers

Background

- Mosquito-borne viral disease characterized by acute onset of fever and severe polyarthralgia
- Often occurs as large outbreaks with high attack rates
- Outbreaks have occurred in countries in Africa, Asia, Europe, and the Indian and Pacific Oceans
- In late 2013, first local transmission in the Americas was reported on islands in the Caribbean

Chikungunya virus

- Single-stranded RNA virus
- Genus *Alphavirus*; Family *Togaviridae*

Mosquito vectors

- *Aedes aegypti* and *Aedes albopictus* are the primary vectors (above)
- Both are aggressive daytime biting mosquitoes

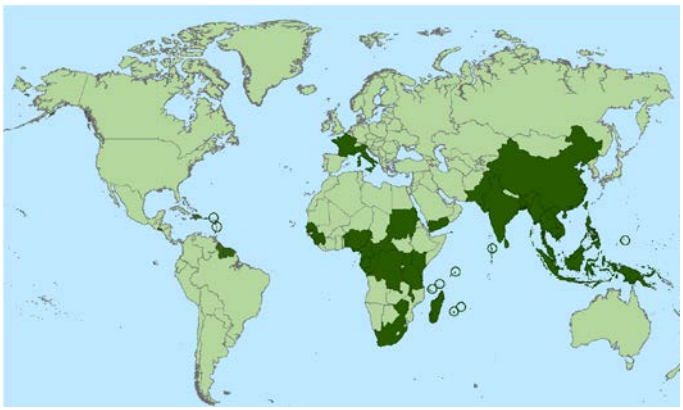
Animal hosts

- Humans are the primary host of chikungunya virus during epidemic periods

Clinical findings

- Majority of infected people become symptomatic
- Incubation period usually 3–7 days (range 1–12 days)
- Acute onset of fever and polyarthralgia are the primary clinical findings
- Joint symptoms usually symmetric and often occur in hands and feet; they can be severe and debilitating
- Other symptoms: Headache, myalgia, arthritis, conjunctivitis, nausea/vomiting, maculopapular rash
- Lymphopenia, thrombocytopenia, elevated creatinine, and elevated hepatic transaminases are the most common clinical laboratory findings

Countries with reported local transmission of chikungunya virus (as of July 2014)



Laboratory testing

- Evaluate serum or plasma by:
  - Viral culture to detect virus in first 3 days of illness
  - RT-PCR to detect viral RNA in first 8 days of illness
  - Serology to detect IgM, IgG, and neutralizing antibodies that develop toward the end of the first week of illness (≥4 days post illness onset)
- Chikungunya testing is performed at CDC, several state health departments, and one commercial laboratory
- Contact your state health department for more information and to facilitate testing

Clinical course and outcomes

- Acute symptoms typically resolve within 7–10 days
- Rare complications include uveitis, retinitis, myocarditis, hepatitis, nephritis, bullous skin lesions, hemorrhage, meningoencephalitis, myelitis, Guillain-Barré syndrome, and cranial nerve palsies
- Persons at risk for severe disease include neonates exposed intrapartum, older adults (e.g., > 65 years), and persons with underlying medical conditions (e.g., hypertension, diabetes, or cardiovascular disease)
- Some patients might have relapse of rheumatologic symptoms (e.g., polyarthralgia, polyarthritis, tenosynovitis) in the months following acute illness
- Studies report variable proportions of patients with persistent joint pains for months to years

Chikungunya and dengue

- Difficult to distinguish chikungunya and dengue based on clinical findings alone
- Chikungunya and dengue viruses are transmitted by the same mosquitoes
- The viruses can circulate in the same area and cause occasional co-infections in the same patient
- Chikungunya virus more likely to cause high fever, severe polyarthralgia, arthritis, rash, and lymphopenia
- Dengue virus more likely to cause neutropenia, thrombocytopenia, hemorrhage, shock, and deaths
- Patients with suspected chikungunya should be managed as dengue until dengue has been ruled out
  - Proper clinical management of dengue reduces the risk of medical complications and death
  - Aspirin and other NSAIDs can increase the risk of hemorrhage in patients with dengue

Treatment and clinical management

- No specific antiviral therapy; treatment is symptomatic
- Assess hydration and hemodynamic status and provide supportive care as needed
- Evaluate for other serious conditions (e.g., dengue, malaria, and bacterial infections) and treat or manage appropriately
- Collect specimens for diagnostic testing
- Use acetaminophen or paracetamol for initial fever and pain control
  - If inadequate, consider using narcotics or NSAIDs
  - If the patient may have dengue, do not use aspirin or other NSAIDs (e.g., ibuprofen, naproxen, toradol) until they have been afebrile ≥48 hours and have no warning signs for severe dengue*
- Persistent joint pain may benefit from use of NSAIDs, corticosteroids, or physiotherapy

*Warning signs for severe dengue include severe abdominal pain, persistent vomiting, mucosal bleeding, pleural effusion or ascites, lethargy, enlarged liver, and increased hematocrit with decrease in platelet count

Differential diagnosis

- Depends on residence, travel history, and exposures
- Consider dengue, leptospirosis, malaria, rickettsia, group A streptococcus, rubella, measles, parvovirus, enteroviruses, adenovirus, other alphavirus infections (e.g., Mayaro, Ross River, Barmah Forest, O'nyong-nyong, and Sindbis viruses), post-infections arthritis, and rheumatologic conditions

Surveillance and reporting

- Chikungunya virus infection should be considered in patients with acute onset of fever and polyarthralgia, especially travelers who recently returned from areas with known virus transmission
- Healthcare providers are encouraged to report suspected chikungunya cases to their state or local health department to facilitate diagnosis and mitigate the risk of local transmission
- Health departments should perform surveillance for chikungunya cases in returning travelers and be aware of the risk of possible local transmission in areas where *Aedes* species mosquitoes are active
- State health departments are encouraged to report confirmed chikungunya virus infections to CDC

Prevention and control

- No vaccine or medication is available to prevent chikungunya virus infection or disease
- Reduce mosquito exposure
  - Use air conditioning or window/door screens
  - Use mosquito repellents on exposed skin
  - Wear long-sleeved shirts and long pants
  - Wear permethrin-treated clothing
  - Empty standing water from outdoor containers
  - Support local vector control programs
- People suspected to have chikungunya or dengue should be protected from further mosquito exposure during the first week of illness to reduce the risk of local transmission
- People at increased risk for severe disease should consider not traveling to areas with ongoing chikungunya outbreaks

FOR MORE INFORMATION VISIT: www.cdc.gov/chikungunya/

Revised July 1, 2014