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Maine Health Alert Network (HAN) System

PUBLIC HEALTH ADVISORY

To: Health Care Providers
From: Dr. Siiri Bennett, State Epidemiologist
Subject: **Human Arbovirus Information for Healthcare Providers in Maine**
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Abstract:

Summer is here, which means mosquitoes are here as well. Arboviral diseases, including Eastern equine encephalitis (EEE), and West Nile virus (WNV), are serious infections that are transmitted by the bite of an infected **mosquito**. Maine recently identified a case of Jamestown Canyon virus (JCV) infection, a rare arboviral disease carried by mosquitoes. Additionally, Powassan virus is an arboviral disease transmitted by the bite of an infected **tick**. Although rare, these diseases have potentially severe and even fatal consequences for those who contract them. The purpose of this health advisory is to alert clinicians to the potential for human arboviral disease activity in Maine and to consider testing for arboviral disease in patients presenting with unexplained encephalitis, meningitis or high fever ($\geq 100.4^{\circ}\text{F}$ or 38°C) during the summer and early fall.

Human Arbovirus Update for Healthcare Providers in Maine

Summer is here, which means mosquitoes are here as well. Arboviral diseases, including Eastern equine encephalitis (EEE), and West Nile virus (WNV), are serious infections that are transmitted by the bite of an infected **mosquito**. Maine recently identified a case of Jamestown Canyon virus (JCV) infection, a rare arboviral disease carried by mosquitoes. Additionally, Powassan virus is an arboviral disease transmitted by the bite of an infected **tick**. Although rare, these diseases have potentially severe and even fatal consequences for those who contract them. The purpose of this health advisory is to alert clinicians to the potential for human arboviral disease activity in Maine and to consider testing for arboviral disease in patients presenting with unexplained encephalitis, meningitis or high fever ($\geq 100.4^{\circ}\text{F}$ or 38°C) during the summer and early fall.

Background

EEE and WNV were first detected in Maine in 2001 in birds. In 2009, Maine experienced unprecedented EEE activity with 19 animals and 2 mosquito pools testing positive. In 2012, Maine reported our first human case of locally acquired WNV neuroinvasive illness. In 2014, Maine reported our first human case of locally acquired EEE neuroinvasive illness, with the first EEE death occurring in 2015.

Powassan was first identified in Maine in 2000 but is still uncommon. In 2016, Maine reported a confirmed human case of Powassan. As of July 11, 2017, Maine has identified three confirmed cases of Powassan and all cases are recovering.

JCV is a relatively rare arboviral disease that can be carried by multiple mosquito species, including snow melt mosquitoes that are out early in the season. JCV is widely distributed throughout North America, but testing is uncommon so it is likely underdiagnosed. Clinically JCV causes an acute febrile illness, meningitis, or meningoencephalitis. This week, federal CDC's arboviral branch (CDC Fort Collins) confirmed the first ever case identified in a Maine resident. The case had an onset of symptoms in early June, was hospitalized with neuroinvasive disease, and is now recovering at home.

Chikungunya, Dengue, and Zika virus are all travel associated arboviral illnesses. While Maine does not have the mosquitoes that transmit these diseases, providers should also consider these viruses in symptomatic individuals who may have travelled to an affected area. As of July 11, 2017 Maine has one case of Zika, and no cases of Chikungunya or Dengue.

Clinical Features of Arboviral Infections

EEE: EEE is considered to be the most severe arboviral infection found in the United States. Symptoms of EEE usually appear 4 to 10 days after the bite of an infected mosquito, and range from mild flu-like illness to high fever, encephalitis, coma, and death. The EEE case fatality rate is approximately 33% (50% of those who show symptoms) with significant brain damage in most survivors.

JCV: JCV is a relatively rare arboviral infection with symptoms that may include fever, headache, and flu-like illness. Symptoms usually appear 1-14 days after the bite of an infected mosquito. Severe cases involving the central nervous system may include meningitis or encephalitis.

Powassan virus: Many people who become infected with Powassan do not show any symptoms. Symptom onset ranges from about 1 week to 1 month after the tick bite, and includes: fever, headache, vomiting, weakness, confusion, loss of coordination, speech difficulties, seizures, encephalitis, and meningitis. Approximately 10% of Powassan virus encephalitis cases are fatal, and approximately half of survivors have permanent neurological symptoms.

WNV: Symptoms of WNV infection usually appear 3 to 15 days following the bite of an infected mosquito. Most people infected with WNV are asymptomatic. Symptoms can range from a mild flu-like illness to headache, high fever, neck stiffness, altered mental status, convulsions, paralysis, coma, and sometimes death. Less than 1% of people who are infected with WNV will develop serious neurological illness, and about 10% of those who do will die.

Risk Groups

Many people infected with arboviral illness remain asymptomatic. The following groups of people are at higher risk for clinically significant arboviral infection:

- Residents of and visitors to areas with mosquito or tick activity
- People who engage in outdoor work and recreational activities
- Persons over age 50 and younger than age 15

Diagnostic Tests for Arboviral Infections

Diagnosis relies on a high index of suspicion and on results of specific laboratory tests. EEE, Powassan, WNV, or other arboviral infections should be considered in any individual – but especially those over age 50 or younger than age 15 – with an onset of unexplained encephalitis, meningitis, or high fever in the summer and fall. The local presence of EEE and WNV in animals and mosquito pools should further raise the index of suspicion.

If arboviral infection is suspected based on clinical evidence, serum samples and CSF should be submitted for arboviral testing. Maine's Health and Environmental Testing Laboratory (HETL) and many reference laboratories perform arboviral testing. All samples of CSF submitted to HETL should be accompanied by a serum sample. Ideally an acute and a convalescent serum sample should be submitted for each patient. HETL can test for EEE, Powassan, Saint Louis Encephalitis (SLE), and WNV. If Powassan is suspected, EDTA whole blood (purple cap) should be submitted for PCR testing along with the serum and CSF. Testing for Jamestown Canyon virus is performed at CDC Fort Collins, and samples should be coordinated through HETL.

- Acute serum samples should be collected within 14 days of onset of symptoms
- Convalescent serum samples should be collected 10 days to 4 weeks following the acute specimen

Additional Information

- For more information on arboviral disease:
<http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/index.shtml>
- HETL Laboratory Submission Sheet:
<http://www.maine.gov/dhhs/mecdc/public-health-systems/health-and-environmental-testing/micro/documents/wnv-sle-eee.pdf>
- Weekly arboviral reports will be posted throughout the season at:
<http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/arboviral-surveillance.shtml>
- Disease consultation and reporting available through Maine CDC at 1-800-821-5821