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PUBLIC HEALTH ADVISORY

To: Health Care Providers
From: Dr. Isaac Benowitz, State Epidemiologist
Subject: **Arbovirus Update for Health Care Providers in Maine**
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Arbovirus Update for Healthcare Providers in Maine

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 mosquito-borne arboviruses in patients presenting with unexplained encephalitis, meningitis, or high fever (≥100.4°F or 38°C) during the summer and fall.

Eastern Equine Encephalitis virus (EEE), West Nile virus (WNV), and Jamestown Canyon virus (JCV) are serious arboviral infections that are transmitted by the bite of an infected mosquito. All three viruses are endemic in Maine. Maine reported zero human cases of mosquito-borne arboviral illness in 2022. Although rare, these diseases can have severe and even fatal consequences for those who contract them.

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

In 2012, Maine reported the first human case of locally-acquired WNV neuroinvasive illness and in 2018, Maine reported the first equine case of locally-acquired WNV illness.

Maine identified the first human case of locally-acquired JCV neuroinvasive illness in 2017, with the first JCV death occurring in 2018.

Chikungunya, Dengue, and Zika virus are all travel-associated arboviral illnesses. While Maine does not have the mosquitoes that transmit these viruses, providers should also consider these viruses in symptomatic individuals who have travelled to an affected area. Maine reported zero travel-related cases of Dengue, Chikungunya, and Zika in 2022. These resources provide level of risk by country:

- Chikungunya (U.S. CDC): www.cdc.gov/chikungunya/geo/index.html
    - Chikungunya (European CDC): www.ecdc.europa.eu/en/chikungunya-monthly
- Dengue (U.S. CDC): www.cdc.gov/dengue/areaswithrisk/around-the-world.html
- Zika (U.S. CDC): wwwnc.cdc.gov/travel/page/zika-information

Clinical Presentation

Symptoms of EEE, JCV, and WNV infections are similar, however most people infected by these viruses are generally asymptomatic. The clinical presentations of arboviral infections are either neuroinvasive or non-neuroinvasive.

- *Non-neuroinvasive (mild)*: flu-like symptoms such as fever, headache, weakness, and neck stiffness
- *Neuroinvasive (severe)*: symptoms can include vomiting, loss of coordination, speech difficulties, encephalitis, meningitis, confusion, altered mental status, convulsions, seizures, paralysis, coma, and death

Symptoms may appear 4–10 days following a mosquito bite for EEE, 1–14 days following a mosquito bite for JCV, and 3–15 days following a mosquito bite for WNV.

Case fatality rates of arboviruses are often higher than other diseases. For EEE, the rate is about 33% (50% in those who show symptoms) with significant brain damage in most survivors. Approximately 10% of neuroinvasive WNV cases are fatal. The case fatality rate of JCV is not well described, but about 50% of people with symptomatic JCV infections are hospitalized.

Risk Factors

The following groups of people are at higher risk for clinically significant arboviral infection:

- People who engage in outdoor work and recreational activities
- Persons over age 50 and younger than age 15

Prevention

The best way to prevent mosquito-borne illness is to prevent mosquito bites. Maine CDC recommends:

1. Wear long sleeves and pants to reduce exposed skin for mosquitoes to bite.
2. Apply EPA-approved repellents to bare skin according to label instructions. Permethrin is a good option to treat clothing and gear and will remain protective through several washings.
3. Avoid outdoor activities from dusk to dawn when mosquitoes are most active.
4. Reduce the amount of mosquito habitat around the home. Drain artificial sources of standing water around the home to eliminate mosquito larval habitat. For containers that must hold water, like birdbaths and water bowls, change the water at least weekly to disrupt larval development.

Testing

Diagnosis of arboviral infections relies on a high index of suspicion and on results of specific laboratory tests. EEE, JCV, WNV, or other arboviral infections should be considered in any individual with an onset of unexplained encephalitis, meningitis, or high fever in the summer and fall, and especially those over age 50 years or younger than age 15 years. The local presence of EEE, JCV, and WNV in animals and mosquito pools should further raise the index of suspicion. Maine CDC releases health advisories to providers whenever an arboviral disease is detected for the first time in a human, non-human mammal,

or mosquito pool. Providers can find up to date information on reported (mosquito-borne) arboviruses in the weekly arboviral surveillance report posted online.

Maine's Health and Environmental Testing Laboratory (HETL) and many reference laboratories can test for Chikungunya, Dengue, EEE, Saint Louis Encephalitis (SLE), WNV, and Zika. Testing for JCV is only available at U.S. CDC and some reference laboratories.

If providers suspect arboviral infection based on clinical evidence, they should submit serum samples and CSF for arboviral testing. All CSF samples submitted to HETL should be accompanied by a serum sample. Ideally, providers should submit an acute and a convalescent serum sample for each patient.

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

Both the HETL Requisition Form and Arboviral Submission Form are required for testing. When suspicion is high, IgM testing on serum may be forwarded to U.S. CDC for confirmation based on patient symptoms and requires a completed U.S. CDC DASH form. Providers may also submit CSF samples (free of charge) for viral metagenomics for patients with encephalitis of unknown etiology.

Reporting:
Arboviral illnesses are reportable in Maine. All suspect cases and positive laboratory reports should be reported by phone to the 24/7 disease reporting and consultation line at 1-800-821-5821 or by fax to 1-800-293-7534.

Additional Information

- Arboviral testing in Maine for health care providers: www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/documents/Arboviral-Testing-Healthcare.pdf
- How to submit human arboviral specimens to HETL: www.maine.gov/dhhs/mecdc/public-health-systems/health-and-environmental-testing/micro/submitting-samples.shtml
- Maine CDC arboviral diseases website: www.maine.gov/dhhs/vectorborne
- Weekly arboviral reports (July to October): www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/arboviral-surveillance.shtml
- U.S. CDC mosquito website: www.cdc.gov/mosquitoes
- Zika and Dengue testing guidance: www.cdc.gov/zika/hc-providers/testing-guidance.html
- Maine CDC disease reporting and consultation line: **1-800-821-5821** (available 24/7)