

# Mosquito-Borne Diseases

## Provider Information Sheet

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### What mosquito-borne diseases may occur in West Virginia?

The most common mosquito-borne diseases to occur in West Virginia are arboviruses. Four major arboviruses occur in the Eastern United States:

- Eastern equine encephalitis (EEE)
- La Crosse encephalitis (LAC)
- St. Louis encephalitis (SLE)
- West Nile virus (WNV)

In 2012, 14 cases of LAC were reported in our state and 9 cases of WNV were reported. This is the highest number of WNV human cases to be detected in West Virginia in one year. Virtually all counties in West Virginia have found birds that are positive for WNV; EEE-positive birds were found in the state in 2002. No human cases of SLE or EEE have recently been identified in our state, but both these infections occur in surrounding states. SLE has been identified in West Virginia in the past, mostly during the 1970's.

In addition, 2–4 travel-associated cases of mosquito-borne diseases, such as dengue fever and malaria, are detected among West Virginia residents each year.

### What are the signs and symptoms of mosquito-borne arboviruses?

For mosquito-borne arboviruses, the hallmark of illness is acute onset of fever plus neurological signs and symptoms during mosquito season (May to October). Hospitalized patients with encephalitis should always be considered for arbovirus testing during mosquito season.

Mild illness is characterized by fever and headache. Vomiting, arthritis, rash or lymphadenopathy have also been reported with this milder syndrome, especially in persons with WNV.

Other syndromes that have been associated with arboviral infection include:

- Parkinsonism and other movement disorders
- Tremors
- Acute flaccid paralysis
- Neuritis
- Aseptic meningitis

Encephalitis may be very severe and result in altered mental status, seizures, coma and death. EEE is by far the most serious arboviral infection with a case-fatality rate estimated at

### Infectious Disease Epidemiology

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33%. Mortality among hospitalized persons is estimated at 3-30% for SLE; 12% for WNV; and 1% for LAC. WNV and SLE primarily affect the elderly whereas symptomatic LAC disease is most common in children under age 15.

Survivors of mosquito-borne arboviral encephalitis may have long-term neurological deficits. Three to 12% of hospitalized children with LAC have some residual neurological or cognitive abnormality after recovery. Up to 50% of hospitalized WNV patients continue to have symptoms at one year. Thirty-five percent of surviving EEE patients have neurological sequelae.

### How can I make the diagnosis?

Diagnosis is generally confirmed by the presence of clinical illness and detection of virus-specific immunoglobulin M (IgM) and neutralizing antibodies in serum or CSF. Isolation of the virus or detection of viral antigen in blood, CSF, or brain tissue can also be done.

Since the mosquito-borne arboviral encephalitides are clinically indistinguishable, providers should insist that their patients are tested for EEE, LAC, SLE and WNV and that all positive tests are sent to the Office of Laboratory Services (OLS: 304-558-3530) for further testing. Of course, rule out other treatable conditions such as partially treated meningitis or herpes simplex encephalitis. Aseptic meningitis due to enterovirus is also extremely common in the late summer / early fall. A travel history can be helpful in determining if a patient should be tested for additional mosquito-borne diseases not typically seen in West Virginia.

Suspected or confirmed cases of arboviral infection are required to be reported to the local health department so that an environmental investigation can be performed. The primary purpose of the investigation is to identify potential breeding sites for disease-carrying mosquitoes and recommend action to abate these sites. Malaria and dengue fever are also required to be reported to the local health department.

### Where can I get laboratory testing for my patients?

Testing of serum or CSF for LAC, WNV, SLE, and EEE is available free of charge through the Office of Laboratory Services (OLS) at WVDHHR. Call 304-558-3530 to arrange testing. When submitting specimens to OLS for testing, please ensure that submission forms are completely filled out.

<http://www.cdc.gov/ncidod/dvbid/arbor/index.htm>

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<http://www.wvdhhr.org/labservices/labs/virology/arbovirus.cfm>

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