



Arboviral Disease Surveillance and Testing Recommendations

Public health surveillance for arboviruses in mosquitoes, sentinel animals, and humans is ongoing during mosquito season, which is generally considered to be May through November in most parts of Texas. Healthcare providers play an important role in public health surveillance by recognizing and reporting arboviral diseases. Texas Department of State Health Services (DSHS) is reminding medical providers to consider arboviral infections in patients with compatible clinical presentations and to request laboratory testing to confirm the diagnosis. Obtaining a patient's travel history within Texas, to other US states and territories, and internationally during the two weeks prior to onset of illness can help guide the selection of appropriate tests.

Some arboviruses, such as West Nile virus (WNV) and Saint Louis encephalitis virus (SLEV), are considered endemic and may occur anywhere in Texas in any given year. Others, such as eastern and western equine encephalitis viruses (EEEV and WEEV, respectively) and the California encephalitis group (CAL) viruses, may occur sporadically in certain areas of the state. Dengue, chikungunya, and Zika viruses primarily affect individuals who travel to tropical and subtropical areas and northern Mexico, but localized mosquito-borne transmission has occurred along the Texas-Mexico border and in southern Texas.

Patients should be reminded to take preventive measures to avoid mosquito exposure, including wearing long sleeves and pants when outside and using EPA-registered repellents such as DEET, IR3535, oil of lemon eucalyptus, or picaridin. These reminders are especially important for those at higher risk of severe disease, including pregnant women, those over 50 years of age, or immunosuppressed individuals.

Arboviral Infection and Disease

Arboviral infections may be asymptomatic or may result in febrile illnesses of variable severity. Often arboviral infections present as non-localized, self-limited illnesses with headache, myalgias, arthralgias, and possibly skin rash or lymphadenopathy. Sometimes these infections can be associated with myocarditis, pancreatitis, or hepatitis. Occasionally these infections will result in more severe disease, such as dengue hemorrhagic fever or shock syndrome. The neurotropic arboviruses, including WNV, SLEV, EEEV, WEEV, and CAL, may be associated with central nervous system (CNS) involvement. Zika virus, also neurotropic, has been associated with congenital disease when women are infected during pregnancy.

When the CNS is affected, clinical syndromes include aseptic meningitis, myelitis, and encephalitis, which are clinically indistinguishable from similar syndromes caused by other viruses. Arboviral meningitis is usually



characterized by fever, headache, stiff neck, and pleocytosis of the cerebrospinal fluid (CSF). Arboviral myelitis is usually characterized by fever and acute bulbar or limb paresis or flaccid paralysis. Arboviral encephalitis is usually characterized by fever, headache, and altered mental status ranging from confusion to coma, with or without additional signs of brain dysfunction. Less common neurological syndromes can include cranial and peripheral neuritis or other neuropathies, including Guillain-Barré syndrome.

Laboratory testing

Laboratory diagnosis is usually accomplished by testing serum for IgM by enzyme immunoassays (EIA), which are commercially available. Arboviral IgM antibodies are usually detectable by 3-8 days after illness onset. In patients with suspected neuroinvasive disease, additional tests on the CSF should be considered, particularly IgM for the specific arbovirus of interest, as well as a panel for IgM and IgG antibodies for other endemic arboviruses. PCR testing for some arboviruses can be performed on serum or CSF specimens that are collected early in the course of illness and, if positive, may confirm infection.

Because of cross-reactivity between antibodies against flaviviruses, including dengue virus, SLEV, WNV, and Zika virus, an IgM-positive serum specimen may represent a true positive for the flavivirus being tested or it may represent a cross-reaction by an antibody to a different flavivirus to which the patient has been exposed through natural infection or vaccination. The plaque reduction neutralization test (PRNT) is a more specific method which may more accurately identify to which arbovirus(es) the patient's antibodies have responded. PRNT reflects the total neutralizing antibody response to each virus tested and does not reflect the timing of infection. IgM and PRNT results are interpreted together with the patient's exposure and symptomology to determine whether recent infection with a specific arbovirus may have occurred.

Many of these arbovirus tests are available commercially, and some are available through public health laboratories in the Laboratory Response Network (<http://www.dshs.texas.gov/lab/eprLRN.shtm>). Instructions for submitting samples to the DSHS Laboratory are available at www.dshs.texas.gov/lab/MRS_intro.shtm.

Disease Surveillance and Reporting

Please report suspected arboviral disease cases as soon as possible to your local health department or DSHS public health region (<http://www.dshs.texas.gov/idcu/investigation/conditions/contacts/>).

DSHS provides weekly and annual arbovirus activity reports on their WNV website www.TxWestNile.org.