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Division of Public Health

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Date: 7 APR 2014  
To: NC Medical Providers  
From: Dr. Megan Davies, State Epidemiologist   
Subject: Annual Update on Diagnosis and Surveillance for Arboviral disease

**Arboviral Diseases:**

Per North Carolina law, neuroinvasive arboviral diseases are reportable by health care providers to their local health department. These infections are transmitted by the bite of an infected mosquito and the spectrum of illness ranges from asymptomatic to fever, altered mental status, and acute signs of central or peripheral neurologic dysfunction. La Crosse encephalitis (LAC) is the most commonly reported arboviral disease in North Carolina (figures 1, 2) and during 2013 LAC cases represented over 75% of the total arboviral disease burden. Although LAC infection has been reported across the state, cumulative data from 2003 through 2013 demonstrate that the greatest risk from LAC is in the mountain counties of Buncombe, Transylvania, Haywood and Jackson, which have reported over 70% of all LAC cases. While LaCrosse virus infection was first characterized in and named after LaCrosse, Wisconsin, most cases are now reported from focal regions of the eastern US, specifically in Appalachia. [1] West Nile virus infection (WNV) and Eastern Equine encephalitis (EEE) are neuro-invasive diseases also reported in North Carolina, but are much less common than LAC. Over the past five years, fewer than 10 cases total have been reported annually.

**Diagnosis:**

Serologic testing for arboviral diseases is offered at no charge from the State Laboratory of Public Health (NCSLPH). The submission form, DHHS 3445, is available at <http://slph.state.nc.us/virology-serology/special-serology.asp>. Early diagnosis of La Crosse encephalitis is critical to adapting therapy and eliminating unnecessary treatment; and also important for surveillance of the disease. The sensitivity and rapidity of diagnosis of the MAC ELISA test provide a powerful tool for the clinically relevant serodiagnosis of LAC virus infections in humans. [2] MAC ELISA testing is performed by the NCSLPH. Additionally serologic testing by the IFA methodology is available at the NCSLPH. We encourage providers to collect acute AND convalescent (e.g., after two-three weeks) specimens to confirm diagnosis using this methodology.

**Chikungunya surveillance:**

The first local transmission of chikungunya virus in the Americas was recently reported from islands in the Caribbean late last year. Since then, over 2,000 cases have been reported in that region. While infection with chikungunya virus is not reportable in North Carolina, this virus has the potential to cause significant morbidity in portions of the continental United States. At least one case has been identified in a North Carolina resident returning from an endemic area. As competent mosquito vectors are found in North America, including North Carolina, transmission within the U.S. of imported infection is probable in the near future. Chikungunya virus infection should be considered in patients with acute onset of fever and polyarthralgia who recently returned from the Caribbean or from other areas of endemicity (Africa, southern Europe, Asia, and islands in the Indian and Pacific Oceans). Laboratory diagnosis is generally accomplished by testing serum to detect virus, viral nucleic acid, or virus-specific immunoglobulin M (IgM) and neutralizing antibodies. During the first week of illness, chikungunya virus infection can often be diagnosed by using viral culture or nucleic acid amplification on serum. [4] Focus Diagnostics offers chikungunya virus testing ([www.focusdx.com](http://www.focusdx.com)). Focus has agreed to send a report for positive chikungunya virus test results to the appropriate state/local health department per their usual reporting channels.

[www.ncdhhs.gov](http://www.ncdhhs.gov) • [www.publichealth.nc.gov](http://www.publichealth.nc.gov)

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**Education of patients, prevention of disease:**

We encourage all providers to educate their patients about personal protective measures that can be used to minimize their risk of acquiring these conditions. The Centers for Disease Control (CDC) has excellent resources on these and emerging arboviral diseases available at <http://www.cdc.gov/ncidod/dvbid/arbor/index.htm>. There also is updated information on the Division of Public Health’s Communicable Diseases website at <http://epi.publichealth.nc.gov/cd/diseases/arbo.html> If you have any questions or concerns, please call Carl Williams or Jodi Reber at 919-733-3419.

**References:**

- 1.Haddow and Odoi. The Incidence Risk, clustering, and Clinical Presentation of La Crosse Virus Infections in the Eastern US, 2003-2007. PLoS ONE 4(7):e6145
- 2.Calisher et.al. Serodiagnosis of La Crosse virus infections in humans by detection of immunoglobulin M class antibodies. J Clin Microbiol 1986;23:667-71
3. <http://emergency.cdc.gov/HAN/han00358.asp>

**Figures 1, 2**

