Date:  May 23, 2014

From:  CDC, Division of Vector-Borne Diseases, Arboviral Diseases Branch

Subject:  Chikungunya virus diagnostic testing

**Considering chikungunya virus testing**
Chikungunya virus infection should be considered in patients with acute onset of fever and polyarthralgia, especially travelers who recently returned from areas with known virus transmission. Dengue virus infection also should be considered in these patients.

**Chikungunya laboratory assays**
Laboratory evidence of recent chikungunya virus infection is generally accomplished by testing serum or plasma to detect virus, viral nucleic acid, or virus-specific immunoglobulin (Ig) M and neutralizing antibodies. Viral culture may detect virus in the first 3 days of illness; however, chikungunya virus should be handled under biosafety level (BSL) 3 conditions. During the first 8 days of illness, chikungunya viral RNA can often be identified in serum, and RT-PCR is the preferred test (Figure). Chikungunya virus IgM antibodies are generally detectable ≥4 days after onset of illness and can persist for months. Serum collected within 8 days of illness onset may not have detectable IgM antibodies and testing should be repeated on a convalescent-phase sample to rule out infection in those with a compatible clinical syndrome.

![Figure. Viremia and immune response following chikungunya virus infection](image)
Options for obtaining/conducting chikungunya virus diagnostic testing

CDC

Chikungunya virus RT-PCR, IgM ELISA, IgG ELISA, and plaque reduction neutralization tests are performed at the CDC Arboviral Diseases Branch in Fort Collins, Colorado. The specific tests performed will depend on the timing of the specimens relative to illness onset.

For questions about chikungunya laboratory testing or sending specimens to CDC, contact the Arboviral Diseases Branch on-call epidemiologist at 970-221-6400. A completed DASH form should accompany submitted specimens. To determine the appropriate testing algorithm and interpret results, please provide the date of illness onset, dates of specimen collection, specimen type, description of clinical illness, travel history, and contact information for the submitter. More information about submitting specimens to CDC is at: http://www.cdc.gov/ncezid/dvbd/specimensub/arboviral-shipping.html.

State Health Department Laboratories

Chikungunya virus RT-PCR: The CDC chikungunya virus RT-PCR follows essentially the same protocol as the CDC West Nile virus RT-PCR assay. CDC will provide chikungunya virus primer/probe sequences, an RNA-positive control, and a chikungunya RT-PCR proficiency panel to states that have demonstrated proficiency at the CDC West Nile virus RT-PCR assay.

Chikungunya virus IgM ELISA: The CDC chikungunya virus IgM ELISA is similar to the CDC West Nile virus IgM ELISA assay. If your state laboratory demonstrated proficiency doing the CDC West Nile virus IgM ELISA during the 2014 evaluation, you can request chikungunya virus antigen, conjugated antibody, and positive control serum for use in running the CDC chikungunya virus IgM ELISA.

To obtain the materials described above, please contact Brandy Russell at bmk8@cdc.gov or 970-221-6400. If your state health department laboratory does not perform the CDC West Nile virus RT-PCR assay or IgM ELISA assay, consider sending specimens to CDC or using one of the commercial options described below.

Commercially-available testing

Focus Diagnostics (http://www.focusdx.com/) performs a chikungunya virus RT-PCR and IgM and IgG IFA assays.

The Anti-Chikungunya Virus IgM Human ELISA Kit (ab177848) produced by abcam® (http://www.abcam.com/) provides sensitivity comparable to that of the CDC CHIKV IgM ELISA and should be considered for use in laboratories not running the CDC ELISA test.

Attached documents

- Current CDC CHIKV RT-PCR protocol
- Current CDC IgM ELISA protocol