

Zika and Other Travel-Associated Arboviral Disease Laboratory Testing Guidance

Oklahoma State Department of Health Acute Disease Service & Public Health Laboratory

February 10, 2016

Summary

The following guidance provides information for clinicians and laboratories to request testing for Zika virus and other travel-associated arboviral diseases through the Oklahoma State Department of Health (OSDH). There is no commercially available test for Zika virus. Testing for Zika virus must be coordinated between the physician and the Acute Disease Service (ADS) prior to specimen collection. The Epidemiologists in ADS must gather required clinical and travel information from the clinician to determine if a patient meets the criteria for testing. For each patient that meets the established criteria, the ADS Epidemiologist will work with the physician and local laboratory regarding the particulars of specimen collection, forms, and shipping to the OSDH Public Health Laboratory (PHL). All specimens must be approved by the ADS prior to shipping to the OSDH PHL. Specimens are then sent by the PHL to the Centers for Disease Control and Prevention (CDC) for testing.

Zika Virus Testing Criteria

Healthcare providers should report suspected Zika virus disease cases to the OSDH Acute Disease Service Epidemiologist-on-Call at (405) 271-4060 to assess need for testing, facilitate diagnosis and to mitigate the risk of local transmission.

Patients will be considered for testing if they meet the following symptom criteria and travel history. For asymptomatic pregnant women, patients must meet the travel criteria.

- Travel History
 - The patient has a travel history to a country with Zika Virus transmission within the 2 weeks prior to symptom onset (or 2-12 weeks for asymptomatic pregnant women). Countries at risk for Zika Transmission can be found on the following website: http://wwwnc.cdc.gov/travel/page/zika-travel-information
- Clinical Symptoms
 - o Patient must have at least TWO of the following symptoms: Acute Fever, Rash, Arthralgia, or Conjunctivitis

If testing criteria are met, the ADS Epi-on-Call will coordinate specimen collection and testing for Zika, Chikungunya, Dengue Fever, and Yellow Fever (if applicable, based on travel history).



Board of Health



Laboratory assays for acute specimens

To confirm evidence of Zika virus infection, reverse transcription-polymerase chain reaction (RT-PCR) will be performed on serum specimens collected within the first week of illness.

Virus-specific IgM antibodies may be detectable >3 days after onset of illness. However, serum collected within 7 days of illness onset may not have detectable virus-specific IgM antibodies and IgM testing should be repeated on a convalescent-phase sample to rule out infection in patients with a compatible clinical syndrome. IgM antibodies against Zika virus, dengue viruses, and other flaviviruses (e.g., yellow fever and West Nile virus) have strong cross-reactivity possibly generating false positive results in serological tests.

Laboratory assays for convalescent specimens

IgM antibodies typically persist for months. In patients with a compatible clinical syndrome, serum collected more than 8 days after illness onset should be tested by virus-specific IgM ELISA and positive results confirmed by testing for neutralizing antibodies.

There is substantial serological cross-reactivity between the flaviviruses and current IgM antibody assays cannot reliably distinguish between Zika and dengue virus infections. Therefore an IgM positive result in a dengue or Zika IgM ELISA test should be considered indicative of a recent flavivirus infection. Plaque-reduction neutralization tests (PRNT) can be performed to measure virus-specific neutralizing antibodies and may be able to discriminate between cross-reacting antibodies in primary flavivirus infections. For primary flavivirus infections, a fourfold or greater increase in virus-specific neutralizing antibodies between acute- and convalescent-phase serum specimens collected 2 to 3 weeks apart may be used to confirm recent infection. In patients who have been immunized against (e.g., received yellow fever or Japanese encephalitis vaccination) or infected with another flavivirus (e.g., West Nile or St. Louis encephalitis virus) in the past, cross-reactive antibodies in both the IgM and neutralizing antibody assays may make it difficult to identify which flavivirus is causing the patient's current illness.

Laboratory safety

Zika and dengue viruses are classified as biological safety level (BSL) 2 pathogens while chikungunya virus is classified as a BSL-3 agent. All should be handled in accordance with Biosafety in Microbiological and Biomedical Laboratories (BMBL) guidelines and a risk assessment performed for each laboratory for the specific procedures utilized. In particular, because chikungunya virus produces such high levels of viremia, serum from suspected chikungunya virus cases should be treated as potentially infectious even for serological procedures.



Board of Health



Specimen Collection and Storage

- ≥0.5mL serum in a Tiger Top Tube, centrifuged, kept cold or frozen (4°C or colder)
- Blood should be spun down within an hour of specimen collection
- Refrigerate immediately after separation
- For other laboratory specimens such as amniotic fluid, placenta tissue, or umbilical cord, contact the OSDH ADS Epidemiologist-on-Call at (405) 271-4060.

Shipping to OSDH Public Health Laboratory (PHL)

Ship to the OSDH PHL Monday - Thursday

OSDH Public Health Laboratory 1000 NE 10th Street Oklahoma City, OK 73117-1299

- Serum should be shipped in an insulated container with ice packs
- Specimens must be packaged and shipped in accordance with category B agent guidelines
- Courier service to the OSDH Public Health Laboratory
- Specimens will be shipped from OSDH PHL to CDC only Monday Wednesday to avoid weekend deliveries.

Note: Only specimens approved by the ADS Epi-On-Call, through interaction with the healthcare provider, will be accepted by the PHL.

Document content is an excerpt from CDC Laboratory Memorandum, February 7, 2016.

