# Connecticut Department of Public Health

## Testing Performed to Identify Zika Virus Infection

### Principal Tests Available

**RT-PCR** - Test for viral genetic material by reverse transcriptase - polymerase chain reaction. The test can be performed on serum, urine, placental tissue cerebrospinal fluid and amniotic fluid.

**IgM antibodies** - Test is for immunoglobulin M in serum by an enzyme-linked immunosorbent assay (ELISA). May be positive for asymptomatic or symptomatic patients previously exposed. May also cross react with other flaviviruses (e.g. dengue) resulting in a Zika false positive result.

**PRNT** – The plaque reduction neutralization test is a more specific antibody test that is performed on IgM presumptive positive specimens to detect the presence of anti-Zika neutralizing antibodies. While generally more specific than an IgM ELISA it often fails to distinguish serologic reactions to cross reacting flaviviruses such as dengue. This is considered when RT-PCR is not performed.

### Definition of Zika Virus Exposure

- Travel to an area where Zika virus is spread by mosquitoes; or
- Unprotected sex with someone who has travelled to an affected area within 2 weeks of their return

### Primary Symptoms of Zika Virus Associated Illness

- Arthralgia
- Conjunctivitis (non-purulent)
- Fever
- Rash (maculopapular and pruritic)

### Congenital Zika Virus Syndrome (CZS)*

- Microcephaly (including partially collapsed skull)
- Brain anomalies (e.g. cerebral cortex thinning, abnormal gyral patterns, increased fluid spaces, subcortical calcifications, corpus callosum anomalies)
- Ocular abnormalities (e.g. macular scarring, pigmentary retinal mottling, chorioretinal atrophy, optic nerve hypoplasia, micropthalmia)
- Contractures (e.g. club foot)
- Neurologic impairment (e.g. hypertonia, hypotonia, tremors, motor disability, cognitive disability, vision/hearing impairment, epilepsy)

*_Reference_: CDC Defines Congenital Zika Syndrome – Medscape – Nov 03, 2016. http://www.medscape.com/viewarticle/871391

## Testing Guidelines

Based on recommendations of the Centers for Disease Control and Prevention.

*Reference:* Oduyebo T, Polen KD, Walke HT, et al. Update: Interim Guidance for Health Care Providers Caring for Pregnant Women with Possible Zika Virus Exposure — United States (Including U.S. Territories), July 2017. Morbidity and Mortality Weekly Rep 2017;66:781-793. DOI: http://dx.doi.org/10.15585/mmwr.mm6629e1

## Patients Offered Zika Virus Testing at the State Public Health Laboratory (SPHL)

- Pregnant woman
  1) who is exposed during gestation and
  2) becomes ill with ≥1 primary symptom *or*
  3) whose fetus or infant has CZS

  → *Guidelines recommend PCR on serum and urine and IgM on serum, all done concurrently and specimens collected within 12 weeks of exposure*

- Infant
  1) whose mother tested positive *or*
  2) who has CZS and whose mother was exposed during gestation

  → *Guidelines recommend PCR testing of urine and serum collected within 2 days of birth*

- Placenta/Fetal Tissues
  1) if mother was exposed during gestation *and*
  2) pregnancy loss *or*
  3) infant death

  → *Guidelines do not recommend testing if mother tested negative by PCR and IgM*

## Specimen Handling and Request for Testing at the State Public Health Laboratory

Testing of clinical specimens for viral RNA by RT-PCR and IgM antibodies by ELISA is offered at the SPHL for patients who meet clinical and exposure criteria. For questions regarding the **testing criteria** please call the Epidemiology and Emerging Infections Program at **860-509-7994**. For questions regarding **specimen handling** please call the SPHL at **860-920-6640 or -6506**.

**For pregnant women** collect serum (≥ 3 ml) and urine (≥ 1 ml) within **12 weeks** of exposure. For **infants** collect specimens within **2 days** of birth and submit serum (≥ 1 ml) and urine ≥ 1 ml). Specimens can be stored and shipped refrigerated (2-6°C) or frozen (-70°C). Urine should be collected in a sterile container with a tight fitting screw cap (possibly film secured). Refrigerated specimens may be shipped to the SPHL with adequate ice packs, and for frozen specimens, ship on dry ice to ensure specimens remain frozen until received.

When submitting ***placental tissue*** include sections of the placental disk (3 full thickness pieces from the middle third and one from the margin), fetal membranes 5x12 cm strip, and pathologic lesions when possible. Fix specimens in formalin with a volume 10x the mass of tissue. Specimens can be shipped at room temperature.

Providers must complete all required fields on the SPHL ***Clinical Test Requisition OL-9B form***: http://www.ct.gov/dph/lib/dph/laboratory/labhome/forms/clinical_test_requisition_ol9b_fill.pdf.

- In the ***Test, Agent or Disease, Not Listed*** *box* write in "Zika virus"
- In the ***Comments*** box provide justification for submission including:
  - For a **pregnant patient**, the date of onset of illness, the primary symptom(s) and estimated due date, *or* the abnormal fetal ultrasound finding suggesting CZS
  - For an **infant**, the birth defect suggesting CZS *or* the date of the mother's positive Zika test result and testing laboratory name
  - For **placental tissues**, description of pregnancy outcome (i.e. mother exposed, pregnancy loss *or* infant death)

Specimens may be packaged and shipped to the SPHL as ***Category B Biological Substances*** in accordance with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 171-180).

**Testing Referred to Commercial Laboratories**

- Pregnant woman
  1) Asymptomatic *(i.e. does not have a primary symptom)* with an exposure

  → *Guidelines do not recommend testing asymptomatic pregnant women unless fetus has CZS*

  2) Asymptomatic with ongoing exposures *(e.g. frequent travel or unprotected sex with a traveler to affected area)*

  → *Guidelines recommend PCR testing of urine and serum at first prenatal visit and at two subsequent visits if exposures cannot be avoided*

- Infants
  1) Normal pre/post-natal exams, mother was exposed during gestation and tested negative or was not tested

  → *Guidelines do not recommend routine testing of healthy infants*

- Non-pregnant patients
  1) Preconception testing of women with ongoing exposures to establish baseline IgM

  → *Guidelines do not recommend IgM testing for this purpose*

  2) Asymptomatic exposed patients

  → *Guidelines do not recommend testing asymptomatic patients*

## Commercial Laboratories Testing for Zika Virus

Please see ***Disclaimer*** at: http://portal.ct.gov/policies/disclaimer/

1. **Quest Diagnostics Laboratory**

   Information is available at: http://www.questdiagnostics.com/home/physicians/testing-services/condition/infectious-diseases/zika

2. **Laboratory Corporation of America (LabCorp)**

   Information is available at: https://www.labcorp.com/test-menu/37091/zika-virus-comprehensive-profile-naa-serum-and-urine

3. **Mayo Medical Laboratory**
   Information is available at: http://www.mayomedicallaboratories.com/test-catalog/alphabetical/Z