ZIKA VIRUS (ZIKV) FAQ & PRIMER
FOR HEALTH CARE PROVIDERS

OVERVIEW

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Last Updated: February 29, 2016
GLOBAL, NATIONAL, AND LOCAL EXTENT OF ZIKA VIRUS DISEASE

1. What areas have active transmission of Zika virus?¹

Central America (El Salvador, Guatemala, Honduras, Panama), South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Suriname, Venezuela), the Caribbean (Barbados, Dominican Republic, Guadeloupe, Haiti, Martinique, Puerto Rico, Saint Martin, U.S. Virgin Islands), Samoa, Cape Verde, or Mexico.¹

This information changes rapidly so always check the Centers for Disease Control and Prevention (CDC) Zika Travel Information page at:


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2. How many countries are now affected by Zika virus disease?²

As of February 17, 2016, there are 26 countries and territories in the Americas.² Please see http://www.cdc.gov/zika/geo/active-countries.html for a complete and current listing of areas with ongoing Zika virus transmission.

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3. Is there Zika in the United States?¹

Local transmission (CDC definition): A person who has not travelled recently gets bitten by an infected mosquito where they live, work, or play.

Imported case (CDC definition): A person who was bitten by an infected mosquito while travelling away from home.

No local mosquito-borne Zika virus disease cases have been reported in U.S. states, but there have been travel-associated cases.¹

Zika Virus Transmission in the U.S. and U.S. Territories¹

The update below is from the CDC Arboviral Disease Branch. It includes provisional data reported to ArboNet from January 1, 2015 to February 17, 2016 as of February 24, 2016:


1. U.S. States:

   Travel-associated Zika virus cases reported: 107 (6 in California, all travel related)
   Locally acquired vector-borne cases reported: 0

2. U.S. Territories:

   Travel-associated cases reported: 0
   Locally acquired cases reported: 39

4. How many reported cases of Zika virus disease are there in California?³

   See table from California Department of Public Health below.

   CDPH Weekly Update on Number of Laboratory-Positive Zika Cases in California
   February 24, 2016³

   The following table provides the number of travel-associated cases of Zika in California
   residents since 2013. All individuals contracted Zika while travelling outside of the United
   States. CDPH is following CDC testing guidelines. Individuals tested for Zika virus include
   persons returning from an area where Zika virus is circulating who are pregnant and/or have
   symptoms consistent with Zika virus disease. Cases are categorized by year of onset of
   symptoms. This table is updated every Friday.

   Travel-Associated Cases of Zika Virus in California (as of February 26, 2016)³

<table>
<thead>
<tr>
<th>Year</th>
<th>CDC final confirmed cases*</th>
<th>CDC preliminary positive cases**</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>2014</td>
<td>3</td>
<td>NA</td>
</tr>
<tr>
<td>2015</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

   *CDPH has received the final written laboratory report from the CDC indicating the case is
   laboratory confirmed for Zika infection.

   ** CDPH has received preliminary notification of a positive Zika case from the CDC.

³ California Department of Public Health. Weekly Update on Number of Laboratory-Confirmed Cases in California.
   February 23, 2016.
5. How many confirmed cases of Zika virus disease have there been in Long Beach so far?

There have been 0 confirmed cases of Zika virus disease in Long Beach.

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CLINICAL – ZIKA VIRUS DISEASE

6. What is Zika Virus disease?4

Zika Virus (ZIKV) disease is an infectious disease transmitted to people by mosquitoes (called Aedes aegypti and Aedes albopictus).

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7. What are the ways in which ZIKV disease can be transmitted from one to another?2

ZIKV can be transmitted via:

1. The bite of Aedes species mosquitoes (mosquito borne disease).
2. Intrapartum transmission from a mother with viremia to her infant.
4. Laboratory exposures.
5. Blood transfusion and organ or tissue transplantation pose theoretical risks for transmission.

There is no reported evidence of transmission through breastfeeding, although Zika virus RNA has been found in breast milk.

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8. What are the symptoms of ZIKV disease?4

Most people have no symptoms (80%). If symptoms do develop (20%), the most common are fever, rash, joint pain, and/or red eyes. Symptoms are usually mild. Severe disease requiring hospitalization is uncommon.

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9. **How soon do symptoms develop from the time a person is bitten by an infected mosquito to the time symptoms develop?**

Symptoms usually begin 3 to 7 days after the infected mosquito bite.

The exact incubation period of Zika virus disease has yet to be determined but evidence from *flavivirus* infections indicate that the incubation period is likely 3 days to 2 weeks. 

10. **How long do symptoms last?**

Symptom duration is from several days to about a week.

11. **How long is the period of viremia?**

Viremia is expected to last approximately one week in patients with clinical illness.

12. **Can people die from Zika virus disease?**

Deaths from Zika virus infection appear to be rare in persons of all ages.

**ZIKA VIRUS DISEASE IN ADULTS**

13. **What are the next steps if Zika virus disease testing comes back positive? Is there an algorithm?**

Yes. Follow the algorithm below.

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FIGURE 1. Updated Interim guidance: testing algorithm*, †, §, ¶, ** for a pregnant woman with history of travel to an area with ongoing Zika virus transmission

* Testing is recommended for pregnant women with clinical illness consistent with Zika virus disease, which includes two or more of the following signs or symptoms: acute onset of fever, maculopapular rash, arthralgia, or conjunctivitis during or within 2 weeks of travel. Testing includes Zika virus reverse transcription-polymerase chain reaction (RT-PCR), and Zika virus immunoglobulin M (IgM) and neutralizing antibodies on serum specimens (http://www.aphl.org/Materials/CDCMemo_Zika_Chik_Deng_Testing_011916.pdf). Because of the overlap of symptoms and areas where other viral illnesses are endemic, evaluation for dengue or chikungunya virus infection is also recommended.

† Testing can be offered to pregnant women without clinical illness consistent with Zika virus disease. If performed, testing should include Zika virus IgM, and if IgM test result is positive or indeterminate, neutralizing antibodies on serum specimens. Testing should be performed 2–12 weeks after travel.

§ Laboratory evidence of maternal Zika virus infection: (1) Zika virus RNA detected by RT-PCR in any clinical specimen; or (2) positive Zika virus IgM with confirmatory neutralizing antibody titers that are ≥ 4-fold higher than dengue virus neutralizing antibody titers in serum. Testing is considered inconclusive if Zika virus neutralizing antibody titers are < 4-fold higher than dengue virus neutralizing antibody titers.
Fetal ultrasounds might not detect microcephaly or intracranial calcifications until the late second or early third trimester of pregnancy.

** Amniocentesis is not recommended until after 15 weeks of gestation. Amniotic fluid should be tested for Zika virus RNA by RT-PCR. The sensitivity and specificity of RT-PCR testing on amniotic fluid are not known.

14. **If Zika virus disease testing comes back positive, what should the medical provider do?**

There are several steps a provider should take:

- If the patient is pregnant, then follow the algorithm in the previous question (serial fetal ultrasounds every 3-4 weeks, amniocentesis, referral to maternal-fetal medicine specialist).

- Zika testing is recommended at the time of delivery including (1) histopathologic testing of the placenta and umbilical cord, (2) testing of frozen placental tissue and cord tissue for Zika virus RNA, and (3) testing of cord serum. If pregnancy ended in fetal loss, then Zika PCR and immunohistochemical staining should be done on fetal tissues, including the placenta and umbilical cord.

15. **If Zika virus disease testing comes back positive, what should the patient do to prevent the spread of Zika virus to others?**

There are several steps a patient can take:

- To prevent human-to-mosquito-to-human transmission, persons infected with Zika virus should protect themselves from mosquito exposure during the first week of illness.

- The number of mosquitoes in and around homes can be reduced by (1) emptying standing water from containers, (2) installing/repairing screens on windows and doors, and (3) using air conditioning, if available.

- The CDC has a Mosquito Bite Prevention information page accessible at: [http://www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf](http://www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf)
16. If Zika virus disease testing comes back negative, what steps should be taken next?

A negative IgM result obtained 2 to 12 weeks after travel would suggest that a recent infection did not occur and could obviate the need for serial ultrasounds. However, a negative serologic test result obtained 2-12 weeks after travel cannot definitively rule out Zika virus infection.

What is important to remember about the 2-12 weeks after travel cut off?

Based on experience with other flaviviruses, IgM will be expected to be present at least 2 weeks after the exposure and persist for up to 12 weeks.

Guidance for patients who test negative for Zika virus:

- Pregnant women whose male partners reside in or have traveled to an area of active Zika virus transmission should discuss their male partner’s potential exposures to mosquitoes and history of Zika-like illness with their healthcare provider. Avoid sex or use condoms correctly and consistently throughout the duration of pregnancy.

- Non-pregnant partners of men who reside in or have traveled to an area of active Zika virus transmission and are concerned about sexual transmission of Zika virus might consider (1) abstaining from sex or (2) use condoms correctly and consistently during sex. Couples should also consider that (1) most Zika infections are asymptomatic; (2) when illness does occur, it is usually mild with symptoms lasting from several days to a week, and (3) after infection, Zika virus might persist in semen when it is no longer detectable in blood.

- At present, Zika virus testing to assess for risk of sexual transmission is of uncertain value and is not recommended. This is because the current information on the incidence and duration of Zika virus in the genitourinary tract is limited to one case report in which Zika virus persisted longer than in blood.

17. What happens to babies of mothers who have ZIKV?

There is a possible association between Zika virus and microcephaly (abnormally small head and brain) in newborns. However, there are many causes of microcephaly in babies and whether Zika virus infection causes microcephaly has not been confirmed.
18. Are pregnant women more susceptible to Zika virus infection?\(^6\)

There is no evidence that pregnant women are more susceptible to Zika virus infection or experience more severe disease during pregnancy than the general population.

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19. Would a woman who tested positive for Zika virus be at risk for Zika virus disease during all her future pregnancies?\(^5\)

There is no evidence that prior Zika virus infection poses a risk for birth defects in future pregnancies because viremia is expected to last approximately one week in patients with clinical illness. There is no current evidence to suggest that a fetus conceived after maternal viremia has resolved would be at risk for fetal infection.

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20. How useful is amniotic fluid for Zika virus testing?\(^6\)

Zika virus PCR can be performed on amniotic fluid but the sensitivity and specificity of this test for congenital Zika infection is unknown. It is also unknown if a positive Zika test result on amniotic fluid predicts subsequent fetal abnormality and, if so, what proportion of infants born after infection will have abnormalities.

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21. So, why use amniotic fluid?\(^6\)

A positive PCR on amniotic fluid is suggestive of intrauterine Zika virus infection and potentially useful to the patient and provider. Providers should discuss the benefits and risks of amniocentesis with patients.

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22. What are the dangers of amniocentesis?\(^6\)

Amniocentesis has an overall 0.1% risk of pregnancy loss when performed < 24 weeks of gestation (AOG). Amniocentesis performed ≥ 15 weeks of AOG is associated with lower rates of complications than those performed at earlier gestational ages. Early amniocentesis ≤ 14 weeks is not recommended.

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23. When should you suspect congenital Zika virus disease?

Congenital infections result from intrauterine transmission from mother to fetus during pregnancy. Testing of infants with possible congenital Zika virus infection who were born to mothers who travelled to or resided in areas affected by Zika virus during pregnancy should be guided by: (1) whether the infant had microcephaly or intracranial calcifications detected prenatally or at birth and (2) the mother’s Zika virus testing results.

The results of previous prenatal ultrasounds and maternal Zika virus testing should be reviewed, and a thorough newborn physical examination, with assessment of head (occipitofrontal) circumference, length, and weight, should be performed.

The evaluation of infants with microcephaly or intracranial calcifications or infants whose mothers have positive or inconclusive test results for Zika virus infection remains the same as described in the recommendations released on January 26, 2016.

FIGURE 2. Interim guidelines for the evaluation and testing of infants whose mothers travelled to or resided in an area with ongoing Zika virus transmission during pregnancy during pregnancy


†Microcephaly defined as occipitofrontal circumference less than the third percentile for gestational age and sex based on standard growth curves (26,27), not explained by other etiologies.

§Laboratory evidence of Zika virus infection includes (1) detectable Zika virus, Zika virus RNA, or Zika virus antigen in any clinical specimen; or (2) positive Zika virus IgM with confirmatory neutralizing antibody titers that are ≥ 4-fold higher than dengue virus neutralizing antibody titers in serum or cerebrospinal fluid. Testing is considered inconclusive if Zika virus neutralizing antibody titers are < 4-fold higher than dengue virus neutralizing antibody titers.

¶For infants, perform reverse transcription–polymerase chain reaction (RT-PCR) testing for Zika virus RNA and Zika virus and dengue virus IgM and neutralizing antibodies on serum collected from the umbilical cord or directly from infant within 2 days of birth, if possible. If cerebrospinal fluid is obtained for other reasons, test for Zika virus RNA, Zika virus IgM and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies. Consider histopathologic evaluation of the placenta and umbilical cord with Zika virus immunohistochemical staining on fixed tissue and Zika virus RT-PCR on fixed and frozen tissue. More information on laboratory testing for Zika virus infection is available at [http://www.cdc.gov/zika/state-labs/index.html](http://www.cdc.gov/zika/state-labs/index.html).

<table>
<thead>
<tr>
<th>Box 1. Recommended Zika virus laboratory testing for infants and children when indicated*,†,§</th>
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<tbody>
<tr>
<td><strong>For possible congenital Zika virus infection:</strong></td>
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<tr>
<td>▪ Test infant serum for Zika virus RNA, Zika virus immunoglobulin M (IgM) and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies. The initial sample should be collected either from the umbilical cord or directly from the infant within 2 days of birth, if possible.</td>
</tr>
<tr>
<td>▪ If cerebrospinal fluid is obtained for other studies, test for Zika virus RNA, Zika virus IgM and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies.</td>
</tr>
<tr>
<td>▪ Consider histopathologic evaluation of the placenta and umbilical cord with Zika virus immunohistochemical staining on fixed tissue and Zika virus reverse transcription-polymerase chain reaction (RT-PCR) on fixed and frozen tissue.</td>
</tr>
<tr>
<td>▪ If not already performed during pregnancy, test mother’s serum for Zika virus IgM and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies.</td>
</tr>
<tr>
<td><strong>For possible acute Zika virus disease:</strong></td>
</tr>
<tr>
<td>▪ If symptoms have been present for &lt;7 days, test serum (and, if obtained for other reasons,</td>
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</tbody>
</table>
cerebrospinal fluid) for Zika virus RNA by RT-PCR.

- If Zika virus RNA is not detected and symptoms have been present for ≥4 days, test serum (and, if obtained for other reasons, cerebrospinal fluid) for Zika virus IgM and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies.


*Indications for testing for congenital infection include 1) an infant with microcephaly or intracranial calcifications born to a woman who travelled to or resided in an area with Zika virus transmission while she was pregnant, or 2) an infant born to a mother with a positive or inconclusive test result for Zika virus infection.

† Indications for testing during acute disease include: Infants and children aged <18 years who 1) travelled to or resided in an affected area within the past 2 weeks and 2) have ≥2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia. Infants in the first 2 weeks of life 1) whose mothers have travelled to or resided in an affected area within 2 weeks of delivery and 2) have ≥2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia.


### Box 2. Recommended clinical evaluation and laboratory testing for infants with possible congenital Zika virus infection

For all infants with possible congenital Zika virus infection, perform the following:

- Comprehensive physical examination, including careful measurement of occipitofrontal circumference, length, weight, and assessment of gestational age.

- Evaluation for neurologic abnormalities, dysmorphic features, splenomegaly, hepatomegaly, and rash or other skin lesions. Full body photographs and photographic documentation of any rash, skin lesions, or dysmorphic features should be performed. If an abnormality is noted, consultation with an appropriate specialist is recommended.

- Cranial ultrasound, unless prenatal ultrasound results from third trimester demonstrated no abnormalities of the brain.

- Evaluation of hearing by evoked otoacoustic emissions testing or auditory brainstem response testing, either before discharge from the hospital or within 1 month after birth. Infants with abnormal initial hearing screens should be referred to an audiologist for further evaluation.

- Ophthalmologic evaluation, including examination of the retina, either before discharge from the hospital or within 1 month after birth. Infants with abnormal initial eye evaluation should be referred to a pediatric ophthalmologist for further evaluation.
Other evaluations specific to the infant’s clinical presentation.

For infants with microcephaly or intracranial calcifications, additional evaluation includes the following:

- Consultation with a clinical geneticist or dysmorphologist.
- Consultation with a pediatric neurologist to determine appropriate brain imaging and additional evaluation (e.g., ultrasound, computerized tomography scan, magnetic resonance imaging, and electroencephalogram).
- Testing for other congenital infections such as syphilis, toxoplasmosis, rubella, cytomegalovirus infection, lymphocytic choriomeningitis virus infection, and herpes simplex virus infections. Consider consulting a pediatric infectious disease specialist.
- Complete blood count with platelet count and liver function and enzyme tests, including alanine aminotransferase, aspartate aminotransferase, and bilirubin.
- Consideration of genetic and other teratogenic causes based on additional congenital anomalies that are identified through clinical examination and imaging studies.


Box 3. Recommended long-term follow-up for infants with possible congenital Zika virus infection

For all infants with possible congenital Zika virus infection, recommended long-term follow-up:

- Report case to state, territorial, or local health department and monitor for additional guidance as it is released.
- Consider conducting additional hearing screen at age 6 months. Refer any child with developmental delay for an audiologic evaluation. Ensure that appropriate follow-up of abnormal newborn hearing screening has occurred.
- Carefully evaluate occipitofrontal circumference and developmental characteristics and milestones throughout the first year of life, in consultation with appropriate medical specialists (e.g., pediatric neurology, developmental and behavioral pediatrics, physical and speech therapy).

24. **If testing for Zika virus disease is negative for both mother and child, what are the next steps?**

Infants without microcephaly or intracranial calcifications whose mothers have negative Zika virus test results or who were not tested for Zika virus should receive routine care (see Figure 1 above). Because information on the effects of congenital Zika virus infection is limited, health care providers should exercise clinical judgment in the assessment of newborns with abnormalities other than microcephaly or intracranial calcifications who were born to mothers who travelled to or resided in an area with active Zika virus transmission during pregnancy. For these infants, health care providers should consider testing the mother before testing the infant. These guidelines will be updated as additional information becomes available.

25. **Is perinatal transmission of Zika virus disease possible?**

Yes. Infants can also be infected perinatally if the mother became infected with Zika virus during travel to or residence in an area with Zika virus transmission within 2 weeks of delivery. Infants whose mothers reported illness consistent with Zika virus disease near the time of delivery should be monitored for signs and symptoms of Zika virus disease. If an infant shows signs and symptoms of acute Zika virus disease within the first 2 weeks of life, both the mother and infant should be tested for Zika virus infection.

The spectrum of Zika virus disease in neonates infected in the perinatal period is unknown. Perinatal transmission of Zika virus infection to infants from mothers infected near the time of delivery has been reported in two cases; one of these infants was asymptomatic, and the other had thrombocytopenia and a diffuse rash. The clinical features that might be observed in infants who acquire Zika virus during the perinatal period are currently unknown.

26. **When should you suspect acute Zika virus disease in infant or children ≤ 18 years of age?**

**Acute** Zika virus disease should be suspected in an infant or child aged < 18 years who: (1) travelled to or resided in an affected area within the past 2 weeks and (2) has ≥ 2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia.

Because maternal-infant transmission of Zika virus during delivery is possible, **acute** Zika virus disease should also be suspected in an infant during the first 2 weeks of life whose (1) mother travelled to or resided in an affected area within 2 weeks of delivery and (2) who has ≥ 2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia.
Evaluation of infants and children for acute (symptom onset within the past 7 days) Zika virus infection should include testing of serum and, if obtained for other reasons, cerebrospinal fluid (CSF) specimens for evidence of Zika virus RNA using RT-PCR. If Zika virus RNA is not detected and symptoms have been present for ≥ 4 days, serum may be tested for Zika virus immunoglobulin M (IgM) and neutralizing antibodies, and dengue virus IgM and neutralizing antibodies (see Box 1 above). Laboratory evidence of Zika virus infection in an infant or child would include, in any clinical specimen, detectable Zika virus in culture, Zika virus RNA or antigen, or a clinical specimen positive for Zika virus IgM with confirmatory neutralizing antibody titers ≥ 4-fold higher than dengue virus neutralizing antibody titers (1). If Zika virus antibody titers are < 4-fold higher than dengue virus neutralizing antibody titers, test results for Zika virus are considered inconclusive (1). More information on laboratory testing can be found at [http://www.cdc.gov/zika/state-labs/index.html](http://www.cdc.gov/zika/state-labs/index.html).

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27. **How do you detect arthralgia in infants and young children?**

Arthralgia can be difficult to detect in infants and young children and can manifest as irritability, walking with a limp (for ambulatory children), difficulty moving or refusing to move an extremity, pain on palpation, or pain with active or passive movement of the affected joint.

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28. **What is Zika virus disease like in children?**

The spectrum of Zika virus disease in infants and children who are infected through mosquito bites indicates that most children are asymptomatic or have mild illness. Among eight recent travel-related cases among children in the United States, all had rash and at least one other sign or symptom (fever, arthralgia, nonpurulent conjunctivitis) (CDC, unpublished data, 2016).

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29. **What is the rash of Zika virus disease like?**

Pruritic and maculopapular.

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30. **What is known about breastfeeding in mothers with Zika virus disease?**

Zika virus RNA has been identified in breast milk, but attempts to culture the virus have been unsuccessful. No cases of Zika virus infection associated with breastfeeding have been reported.
The CDC encourages mothers with Zika virus infection and living in areas with ongoing Zika virus transmission to breastfeed their infants. Current evidence suggests that the benefits of breastfeeding outweigh the theoretical risks of Zika virus transmission through breast milk.

LABORATORY TESTING

31. I am a Long Beach provider. If I suspect Zika virus disease in a returning traveler or a person who resided in a Zika virus-affected area, where can my patient receive Zika virus testing?

As of February 11, 2016, the City of Long Department of Health and Human Services (LBDHHS) will be offering 3 options for collecting specimens for ZIKV diagnostic testing:

1. Collecting and Transporting Specimens to the Long Beach Public Health Laboratory

Providers can draw blood for ZIKV testing at their own clinic/office, and then drop-off or send in specimens with the required forms to:

Long Beach Public Health Laboratory
2525 Grand Avenue, Room 260, Long Beach, CA 90815
Phone: (562) 570-4080

2. Specimen Pick-Up from Your Clinic/Office Via Courier, Free of Charge

Providers can draw blood at their own clinic/office, and then request specimen pick-up via a courier, provided free of charge by the LBDHHS. Specimens should be collected and stored per the Zika Virus (ZIKV) Diagnostic Specimen Testing Guidelines.

To arrange for specimen pick-up from your clinic/office, please call the LBDHHS Epidemiology/Communicable Disease Control Program at (562) 570-4302.

At this time, specimen pick up is only offered on Wednesdays and Fridays from 1 pm to 3 pm. Late Friday pick up can be arranged by calling (562) 570-4302 or (562) 570-4080. This schedule may expand as the need arises. Please batch specimens from multiple patients for pick up per this schedule.

3. Phlebotomy at the Long Beach Public Health Laboratory, Free of Charge

Providers can send patients to the Long Beach Public Health Laboratory for phlebotomy services free of charge. Please call (562) 570-4080 to schedule a blood draw appointment for your patient. All required forms must be submitted at the time of the blood draw.
32. Are there any required forms to request Zika virus testing?

Yes – two completed forms are required by the Long Beach Public Health Laboratory, along with a complete clinical and travel history. These forms include:

1. Zika Virus (ZIKV) Test Screening Questionnaire for Providers (pp. 9-10)
2. Long Beach Public Health Laboratory Request Form (pg. 54)

33. Is Zika virus testing free of charge through the Long Beach Public Health Laboratory?

Yes.

34. For Long Beach providers who care for pregnant women and women of reproductive age with possible Zika virus exposure, what are the indications for Zika virus testing? When should a test be ordered?

1. Testing is not indicated for women without a travel history to an area with Zika virus transmission.  

2. For pregnant women, the asymptomatic, and individual who have travelled to areas with ongoing Zika virus transmission:
   a. Offer serologic testing to asymptomatic pregnant women (women who do not report clinical illness consistent with Zika virus disease) who have travelled to areas with ongoing Zika virus transmission.  
      Testing can be offered 2 to 12 weeks after pregnant women return from travel. Interpretation of results among asymptomatic women is complex because of cross reactivity among related flaviviruses, such as dengue, yellow fever and West Nile virus.
   
   b. Health care providers may follow the Zika Virus Test Algorithm below to determine when Zika virus testing is indicated.

3. Pregnant women, the symptomatic, or individuals who have travelled to areas with ongoing Zika virus transmission:
   a. Testing is recommended during the 1st week of illness.

4. Pregnant women, the asymptomatic, and individuals residing in areas with ongoing Zika virus transmission:
   a. Testing is recommended at (1) initiation of prenatal care with (2) follow up testing mid-2nd trimester. Pregnant women who reside in areas with ongoing
Zika virus transmission have an ongoing risk for infection throughout their pregnancy.\(^5\)

b. If Zika virus IgM testing is negative, routine prenatal care should include an ultrasound at 18-20 weeks gestation to assess fetal anatomy, including looking for microcephaly and intracranial calcifications. Because fetal microcephaly is most easily detected in the late second and early third trimesters, and because of ongoing potential exposure to Zika virus, providers might consider an additional fetal ultrasound later in pregnancy.\(^5\)

c. If a prenatal ultrasound shows fetal microcephaly or intracranial calcifications, repeat maternal IgM testing and consider amniocentesis (PCR), depending on gestational age.\(^5\)

5. Pregnant women for whom the results of Zika virus testing are negative but microcephaly and/or intracranial calcifications are detected on fetal ultrasound.\(^3\)

6. Males, the symptomatic, and individuals who reside in or have travelled to areas with ongoing Zika virus transmission.\(^5\)

Note: Visit these sites regularly to obtain the most up-to-date testing guidelines, as information about Zika virus changes rapidly:


35. What is important to remember about the 2-12 weeks after travel cut off?\(^5\)

Based on experience with other flaviviruses, IgM will be expected to be present at least 2 weeks after exposure and persist for up to 12 weeks.

36. What types of tests are available to diagnose Zika virus disease?

There are 3 types of tests, as follows:\(^4\)
1. Presence of Zika virus in the blood (PCR) in the first week of illness. Because viremia decreases over time, a negative PCR result from serum collected 5-7 days after symptom onset does not exclude Zika virus infection, and serologic testing should be performed.

2. Serologic testing (IgM antibody tests) on specimens collected ≥ 4 days after onset of symptoms (CDC) and/or after the first week of illness (CDPH). One challenge is that antibodies to several related viruses (flaviviruses), including Zika, dengue, yellow fever & West Nile virus (WNV), cross-react. Hence, a positive IgM result can be difficult to interpret.

3. Plaque Reduction Neutralizing Antibody (PRNT) is a special test to differentiate between these different viral infections.

37. Why is the Long Beach Public Health Laboratory asking for information about the patient’s exposure to dengue and chikungunya virus?

Because of the similar geographic distribution and clinical presentation of Zika, dengue and chikungunya virus infections, patients with symptoms consistent with Zika virus disease should also be evaluated for dengue and chikungunya infections, in accordance with existing guidelines.

38. Why is the Long Beach Public Health Laboratory asking for information about the patient’s vaccination history against yellow fever or Japanese equine encephalitis?

Flavivirus is a genus of viruses in the family Flaviviridae, which includes the West Nile virus, dengue virus, tick borne encephalitis virus, yellow fever virus, Zika virus and several other viruses. Most of these viruses are transmitted by the bite from an infected arthropod (mosquito or tick) and hence, classified as arboviruses. Cross reaction with related flaviviruses (e.g. dengue or yellow fever) is common with antibody testing; thus, it might be difficult to distinguish Zika virus infection from other flaviviruses.

39. Are there any commercially available tests for Zika virus?

None at this time.
40. **Can the Long Beach Public Health Laboratory run tests for Zika virus?**

None at this time.

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41. **Can the CDPH Viral & Rickettsial Disease Laboratory (VRDL) run tests for Zika virus?**

The CDPH VRDL can provide preliminary laboratory testing and coordinate confirmatory testing with the CDC’s Arbovirus Diagnostic Laboratory.

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**ZIKA VIRUS TEST RESULT INTERPRETATION**

42. **What are the next steps if Zika virus disease testing comes back positive? Is there an algorithm?**

Yes. Follow the algorithm below.

*FIGURE 3. Updated Interim guidance: testing algorithm* for a pregnant woman with a history of travel to an area with ongoing Zika virus transmission

![Zika Virus Testing Algorithm](image-url)
* Testing is recommended for pregnant women with clinical illness consistent with Zika virus disease, which includes two or more of the following signs or symptoms: acute onset of fever, maculopapular rash, arthralgia, or conjunctivitis during or within 2 weeks of travel. Testing includes Zika virus reverse transcription-polymerase chain reaction (RT-PCR), and Zika virus immunoglobulin M (IgM) and neutralizing antibodies on serum specimens (http://www.aphl.org/Materials/CDCMemo_Zika_Chik_Deng_Testing_011916.pdf). Because of the overlap of symptoms and areas where other viral illnesses are endemic, evaluation for dengue or chikungunya virus infection is also recommended.

† Testing can be offered to pregnant women without clinical illness consistent with Zika virus disease. If performed, testing should include Zika virus IgM, and if IgM test result is positive or indeterminate, neutralizing antibodies on serum specimens are performed as reflex testing. Testing should be performed 2–12 weeks after travel.

§ Laboratory evidence of maternal Zika virus infection: 1) Zika virus RNA detected by RT-PCR in any clinical specimen; or 2) positive Zika virus IgM with confirmatory neutralizing antibody titers that are ≥ 4-fold higher than dengue virus neutralizing antibody titers in serum. Testing is considered inconclusive if Zika virus neutralizing antibody titers are <4-fold higher than dengue virus neutralizing antibody titers.

¶ Fetal ultrasounds might not detect microcephaly or intracranial calcifications until the late second or early third trimester of pregnancy.

** Amniocentesis is not recommended until after 15 weeks of gestation. Amniotic fluid should be tested for Zika virus RNA by RT-PCR. The sensitivity and specificity of RT-PCR testing on amniotic fluid are not known.

43. **If Zika virus disease testing comes back positive, then what does the medical provider do?**

There are several things that the provider should do:

1. If the patient is pregnant, then follow the algorithm above (serial fetal ultrasounds every 3-4 weeks, amniocentesis, referral to maternal-fetal medicine specialist).

2. Zika testing is recommended at the time of delivery including: (1) histopathologic testing of the placenta and umbilical cord, (2) testing of frozen placental tissue and cord tissue for Zika virus RNA, and (3) testing of cord serum. If pregnancy ended in fetal loss, then Zika PCR and immunohistochemical staining should be done on fetal tissues, including the placenta and umbilical cord.
44. **If Zika virus disease testing comes back positive, then what should the patient do to prevent the spread of Zika virus to the community?**

1. To prevent human to mosquito to human transmission, persons infected with Zika virus should protect themselves from mosquito exposure during the first week of illness.\(^5\)

2. The number of mosquitoes in and around homes can be reduced by: (1) emptying standing water from containers, (2) installing/repairing screens on windows and doors, and (3) using air conditioning, if available.\(^5\)

3. The CDC has a mosquito bite prevention webpage accessible at: [http://www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf](http://www.cdc.gov/chikungunya/pdfs/fs_mosquito_bite_prevention_travelers.pdf)

45. **If Zika virus disease testing comes back negative, what should the provider do?\(^5\)**

There are several things that the provider should do:\(^5\)

1. A negative IgM result obtained 2-12 weeks after travel would suggest that a recent infection did not occur and could obviate the need for serial ultrasounds.\(^5\) However, a negative serologic test result obtained 2-12 weeks after travel cannot definitively rule out Zika virus infection.\(^5\)

2. What is important to remember about the 2-12 weeks after travel cut off? Based on experience with other *flaviviruses*, IgM will be expected to be present at least 2 weeks after virus exposure and persist for up to 12 weeks.\(^5\)

3. Pregnant women whose male partners reside in or have travelled to an area with active Zika virus transmission should discuss their male partner’s potential exposures to mosquitoes and history of Zika-like illness with their health care provider. Pregnant women and their partners should be advised to avoid sex or use condoms correctly and consistently throughout the duration of pregnancy.

4. Non-pregnant partners of men who reside in or have travelled to an area with active Zika virus transmission and are concerned about sexual transmission of Zika virus might consider: (1) abstaining from sex or (2) use condoms correctly and consistently during sex. Couples should also consider: (1) most Zika infections are asymptomatic; (2) when illness does occur, it is usually mild with symptoms lasting from several days to a week; and (3) after infection, Zika virus might persist in semen when it is no longer detectable in blood.

5. At present, Zika virus testing to assess for risk of sexual transmission is of uncertain value and is not recommended. This is because the current information on the incidence and duration of Zika virus in the genitourinary tract is limited to one case report in which Zika virus persisted longer than in blood.
46. **Is Zika virus disease a reportable disease to the City of Long Beach Department of Health and Human Services?**

Yes. Suspected Zika virus infections should be reported immediately to the LBDHHS Epidemiology/Communicable Disease Control Program at:

- **Phone:** (562) 570-4302
- **Fax:** (562) 570-4374
- **Diagnostic or laboratory questions:** (562) 570-4080
- **Clinical questions:** (562) 570-4302
- **Mosquito surveillance questions:** (562) 570-4132

47. **Is there specific treatment for Zika virus disease?**

There is no specific treatment. Supportive care, including rest, fluid replacement, and use of medications to control fever and pain (analgesics and antipyretics) are recommended. Aspirin and nonsteroidal anti-inflammatory drugs (NSAIDS) should be avoided until dengue virus infection can be ruled out.

48. **Is there a vaccine against Zika virus?**

No.

49. **What should Long Beach residents know about Zika virus?**

1. The LBDHHS, CDPH, and CDC are monitoring reports of Zika virus very closely.
2. Updates about Zika virus are regularly disseminated to health care providers in Long Beach.
3. Zika virus is a reportable disease to the LBDHHS.
4. To protect against mosquito bites, residents and visitors are being advised to wear long-sleeved shirts and long pants, remove standing water in areas in and around the home, clean birdbaths and pet-watering dishes weekly, and repair holes in window/door screens.

5. The City of Long Beach Environmental Health Vector Control Program regularly monitors for *Aedes* mosquitoes and tests for mosquito-borne diseases.

6. More information on Zika can be found at:

   - **CDPH:** [https://www.cdph.ca.gov/HealthInfo/discond/Documents/ZikaFactSheet.pdf](https://www.cdph.ca.gov/HealthInfo/discond/Documents/ZikaFactSheet.pdf)

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### 50. What should pregnant Long Beach residents know about Zika?

1. Pregnant women (in any trimester) should consider postponing travel to areas where Zika virus transmission is ongoing.⁴

2. When travel to Zika affected areas cannot be avoided, follow these recommended precautions:
   
   a. Zika Virus Information (CDC):
   
   b. Question & Answer: Zika Virus Infection and Pregnancy (CDC)
   
   c. Zika Travel Information (CDC):
   
   d. California Department of Public Health: Zika Virus in Latin America
      [http://www.cdph.ca.gov/Healthinfo/discond/Documents/CDPHZikaVirusHealthAdvisory.pdf](http://www.cdph.ca.gov/Healthinfo/discond/Documents/CDPHZikaVirusHealthAdvisory.pdf)

3. It is important that Californians avoid mosquito bites while travelling to Zika affected areas to prevent Zika related illness and importation to California.⁴

4. Use insect repellents containing DEET, picardin, IR3535, oil of lemon eucalyptus or para-menthane-diol for long lasting protection.⁴

5. If you use sunscreen and insect repellent, apply the sunscreen first and then the repellent.⁴
6. Using insect repellent is safe and effective. Pregnant women and women who are breastfeeding can choose an EPA registered insect repellent (such as DEET, picardin or IR3535) and use it according to the product label.

7. When weather permits, wear long sleeved shirts and long pants.

8. Use air-conditioning or window and door screens to keep mosquitoes outside.

9. If you are not able to protect yourself from mosquitoes inside your home or hotel, sleep under a mosquito bed net.

10. Help reduce the number of mosquitoes outside your home or hotel room by emptying standing water from containers, such as flowerpots or buckets.

11. CDC has a Mosquito bite prevention webpage accessible at: 

12. Pregnant travelers returning from Zika affected areas should let their doctors know, especially if they develop fever, rash, joint aches or red eyes.

13. Pregnant women whose male partners reside in or have travelled to an area of active Zika virus transmission should discuss their male partner’s potential exposures to mosquitoes and history of Zika-like illness with their healthcare provider. Avoid sex or use condoms correctly and consistently throughout the duration of pregnancy.

51. What is the City of Long Beach Department of Health and Human Services doing in light of the Zika virus outbreak abroad?

The City of Long Beach Department of Health and Human Services is taking several actions:

1. Receive notifications from health care providers when and if there is a suspected case of Zika virus disease.
2. Investigate potential Zika virus cases to determine travel history and other important risk and exposure factors.
3. Report Zika virus case investigation and surveillance information to the CDPH and CDC.
4. Coordinate Zika virus testing requests and submissions with the CDPH and CDC.
5. Provide health education, resources, and updates from the CDPH and CDC to Long Beach health care providers and residents.
52. **Can Zika virus spread in California? In Long Beach?**

It is possible for a returning traveler who has recently been infected with the ZIKV to be bitten by a female *Aedes* mosquito and for that mosquito to then bite someone else and transmit the virus. However, the risk of ZIKV transmission due to this scenario is low.

Some considerations:

1. To date, there have not been any reported cases of local transmission of ZIKV or reports of *Aedes* mosquito sightings in Long Beach and California. The risk of Zika virus transmission in California is low.

2. It is unlikely that Zika virus may spread in California as housing conditions, water management, and mosquito control practices in throughout the State generally provide less contact between humans and *Aedes* mosquitoes than in other countries.

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**AEDES MOSQUITOES & VECTOR CONTROL ISSUES**

53. **Are there *Aedes* mosquitoes in California?**

Yes. *Aedes* mosquitoes have been found in 12 counties in California in the last few years. No *Aedes* mosquito sightings have been reported in Long Beach to date. For a map of *Aedes* mosquitoes detection sites in California from 2011 to 2015, please visit:


54. **Aside from Zika virus disease, what other disease can *Aedes* (*aegypti* or *albopictus*) mosquitoes transmit?**

*Aedes aegypti* and *Aedes albopictus* mosquitoes can also transmit the dengue and chikungunya viruses.

55. **What do we need to know about *Aedes* mosquito vectors?**

*Aedes* mosquitoes bite mostly during daylight hours. Thus, protection from mosquito bites is important throughout the day.

- It is important that Californians avoid mosquito bites while travelling to Zika affected areas to prevent Zika related illness and importation to California.
- Use insect repellents containing DEET, picardin, IR3535, oil of lemon eucalyptus, or para-menthane-diol for long lasting protection.\textsuperscript{4,5}
- If you use sunscreen and insect repellent, apply the sunscreen first and then the repellent.\textsuperscript{4}
- Using insect repellent is safe and effective. Pregnant women and women who are breastfeeding can choose an EPA registered insect repellent (such as DEET, picardin or IR3535) and use it according to the product label.\textsuperscript{4,5}
- When weather permits, wear long sleeved shirts and long pants.\textsuperscript{4,5}
- Use air-conditioning or window and door screens to keep mosquitoes outside.\textsuperscript{4}
- If you are not able to protect yourself from mosquitoes inside your home or hotel, then sleep under a mosquito bed net.\textsuperscript{4}
- Help reduce the number of mosquitoes outside your home or hotel room by emptying standing water from containers such as flowerpots or buckets.\textsuperscript{4}

56. Who monitors Aedes mosquitoes in California?

The CDPH and local vector control districts collaborate to control and limit the further spread of Aedes mosquitoes in California.\textsuperscript{4}

57. Where can I learn more about Aedes mosquitoes?\textsuperscript{7}

To learn more about Aedes mosquitoes, please visit the CDC’s informational page on the Surveillance and Control of Aedes Aegypti and Aedes Albopictus in the United States at:

http://www.cdc.gov/chikungunya/resources/vector-control.html

SEXUAL TRANSMISSION OF ZIKA VIRUS

58. Can Zika virus be sexually transmitted from a man to his sexual partner?

Sexual transmission of Zika virus is possible\textsuperscript{4,5}, although there is limited data about the risk.\textsuperscript{4} 

Current information about possible sexual transmission of Zika is based on reports of three cases

Whether infected men who never develop symptoms can transmit Zika virus to their sex partners is unknown. Sexual transmission of Zika virus from infected women to their sex partners has not been reported. At this time, testing of men for the purpose of assessing risk for sexual transmission is not recommended.

On February 5, 2016, the CDC issued updated interim recommendations for men, who reside in or have traveled to an area of active Zika virus transmission, and their (1) pregnant partners or (2) non pregnant partners. The risk for sexual transmission of Zika virus can be eliminated by abstinence and reduced by correct and consistent use of condoms.

**For men who reside in or have travelled to an area with active Zika virus transmission and who have a pregnant partner, what do you advise them to do?**

Men who have a pregnant partner and who reside in or have travelled to an area with active Zika virus transmission should consider abstaining from sex or using condoms consistently and correctly during any sex (i.e., vaginal or anal intercourse, fellatio) for the duration of the pregnancy.

Pregnant women should discuss their male partner’s potential exposures to mosquitoes and history of Zika-like illness with their healthcare provider.

**Can Zika virus be sexually transmitted from a woman to a man?**

Sexual transmission of Zika virus from infected women to their sex partners has not been reported, nor has transmission from persons who are asymptomatically infected. Use condoms correctly and consistently to prevent possible sexual transmission.

**What is currently known about sexual transmission of Zika virus?**

1. **Symptomatic man to his sexual partner** – Sexual transmission of Zika virus is possible based on 3 cases reported, although there is limited data about the risk.

2. **Asymptomatic man to his sexual partner** – The risk of sexual transmission of Zika virus is unknown.

3. **Zika infected woman to her sexual partner** – The risk of sexual transmission has not been reported.
62. **What is known about Zika virus in semen?**

After infection, Zika virus might persist in semen when it is no longer detectable in blood.⁵ Studies to determine the duration of persistence in semen have not yet been completed.² Zika virus has been isolated from semen but the duration of persistence of Zika virus in semen remains unknown:

http://www.cdc.gov/mmwr/volumes/65/wr/mm6508e2er.htm?s_cid=mm6508e2er.htm_w

63. **Why can’t we test every person who has travelled to or resided in areas with active Zika transmission so that we can avoid the spread of Zika virus to sexual partners?**

At present, Zika virus testing to assess for risk of sexual transmission is of uncertain value and is **not recommended**. This is because the current information on the incidence and duration of Zika virus in the genitourinary tract is limited to one case report in which Zika virus persisted longer than in blood.

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