



# PROVIDER EDUCATION INFORMATION PACKET



UTAH DEPARTMENT OF  
**HEALTH**

Bureau of Epidemiology – 1-888-374-8824 | Utah Birth Defect Network – 1-866-818-7096

October 11, 2016



State of Utah

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*Governor*

SPENCER J. COX  
*Lieutenant Governor*

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6 July 2016

Dear Colleagues,

As you are aware, the World Health Organization (WHO) has declared the Zika virus outbreak a public health emergency of international concern. The Utah Department of Health (UDOH) Zika Action Plan (ZAP) Committee addresses these urgent concerns of Zika virus infection and the threat it poses for pregnant women and infants.

As part of the state's response, this committee has prepared this information packet to assist you as healthcare providers caring for pregnant women and newborns infected with Zika virus. We strongly encourage all obstetrical, family practice providers and hospital clinicians who will be working with pregnant women and infants to familiarize themselves with the contents of this packet.

Please contact the Utah Department of Health, Bureau of Epidemiology at (801) 538-6191 or the Utah Birth Defect Network at (866) 818-7096 with any additional questions or concerns you may have.

Sincerely,

A handwritten signature in black ink, appearing to read "Allyn K. Nakashima, MD".

Allyn K. Nakashima, MD  
State Epidemiologist  
Utah Department of Health



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[www.health.utah.gov/els](http://www.health.utah.gov/els)

To report Disease or Outbreak 1-888-EPI-UTAH (374-8824)

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# Zika: The Basics of the Virus and How To Protect Against It



## About Zika

Zika virus spreads to people primarily through the bite of an infected *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*). People can also get Zika through sex with a man infected with Zika and it can be spread from a pregnant woman to her fetus. People can protect themselves from mosquito bites and getting Zika through sex. This fact sheet explains who's most affected and why, symptoms and treatment, and how to protect against Zika.

## How Zika Spreads

The mosquitoes that carry Zika are aggressive daytime biters, but they can also bite at night. A mosquito becomes infected when it bites a person already infected with Zika. That mosquito can then spread the virus by biting more people.

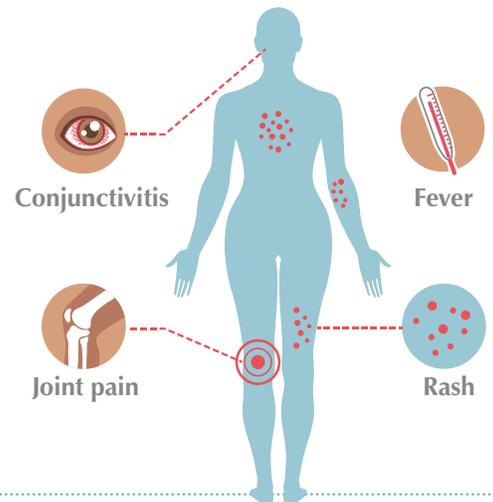


Zika virus can also spread:

- ◆ During sex with a man infected with Zika.
- ◆ From a pregnant woman to her fetus during pregnancy or around the time of birth.
- ◆ Through blood transfusion (likely but not confirmed).

## Zika Symptoms

Many people infected with Zika won't have symptoms or will only have mild symptoms. The most common symptoms are fever, rash, joint pain, or red eyes. Other common symptoms include muscle pain and headache. Symptoms can last for several days to a week. People usually don't get sick enough to go to the hospital, and they very rarely die of Zika. Once a person has been infected with Zika, they are likely to be protected from future infections.



## Current Zika Outbreak

Zika outbreaks are currently happening in many countries and territories. The mosquitoes that can become infected with and spread Zika live in many parts of the world, including parts of the United States.

[Specific areas where Zika virus is spreading](#) are often difficult to determine and are likely to change over time. If traveling, please visit the [CDC Travelers' Health website](#) for the most recent travel information.

## Why Zika is Risky for Some People

Zika infection during pregnancy can cause fetuses to have a birth defect of the brain called microcephaly. Other problems have been detected among fetuses and infants infected with Zika virus before birth, such as defects of the eye, hearing deficits, and impaired growth. There have also been increased reports of Guillain-Barré syndrome, an uncommon sickness of the nervous system, in areas affected by Zika.



## How to Prevent Zika

There is no vaccine to prevent Zika. The best way to prevent diseases spread by mosquitoes is to protect yourself and your family from mosquito bites. Here's how:



- ◆ Wear long-sleeved shirts and long pants.
- ◆ Stay in places with air conditioning and window and door screens to keep mosquitoes outside.
- ◆ Take steps to control mosquitoes [inside and outside your home](#).
- ◆ Treat your clothing and gear with permethrin or buy pre-treated items.
- ◆ Use [Environmental Protection Agency \(EPA\)-registered](#) insect repellents. Always follow the product label instructions.
  - » When used as directed, these insect repellents are proven safe and effective even for pregnant and breastfeeding women.
  - » Do not use insect repellents on babies younger than 2 months old.
  - » Do not use products containing oil of lemon eucalyptus or para-menthane-diol on children younger than 3 years old.
- ◆ Mosquito netting can be used to cover babies younger than 2 months old in carriers, strollers, or cribs to protect them from mosquito bites.
- ◆ Sleep under a mosquito bed net if air conditioned or screened rooms are not available or if sleeping outdoors.
- ◆ [Prevent sexual transmission of Zika by using condoms or not having sex.](#)



## What to do if You Have Zika

There is no specific medicine to treat Zika.

Treat the symptoms:

- ◆ Get plenty of rest.
- ◆ Drink fluids to prevent dehydration.
- ◆ Take medicine such as acetaminophen to reduce fever and pain.
- ◆ Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- ◆ If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.



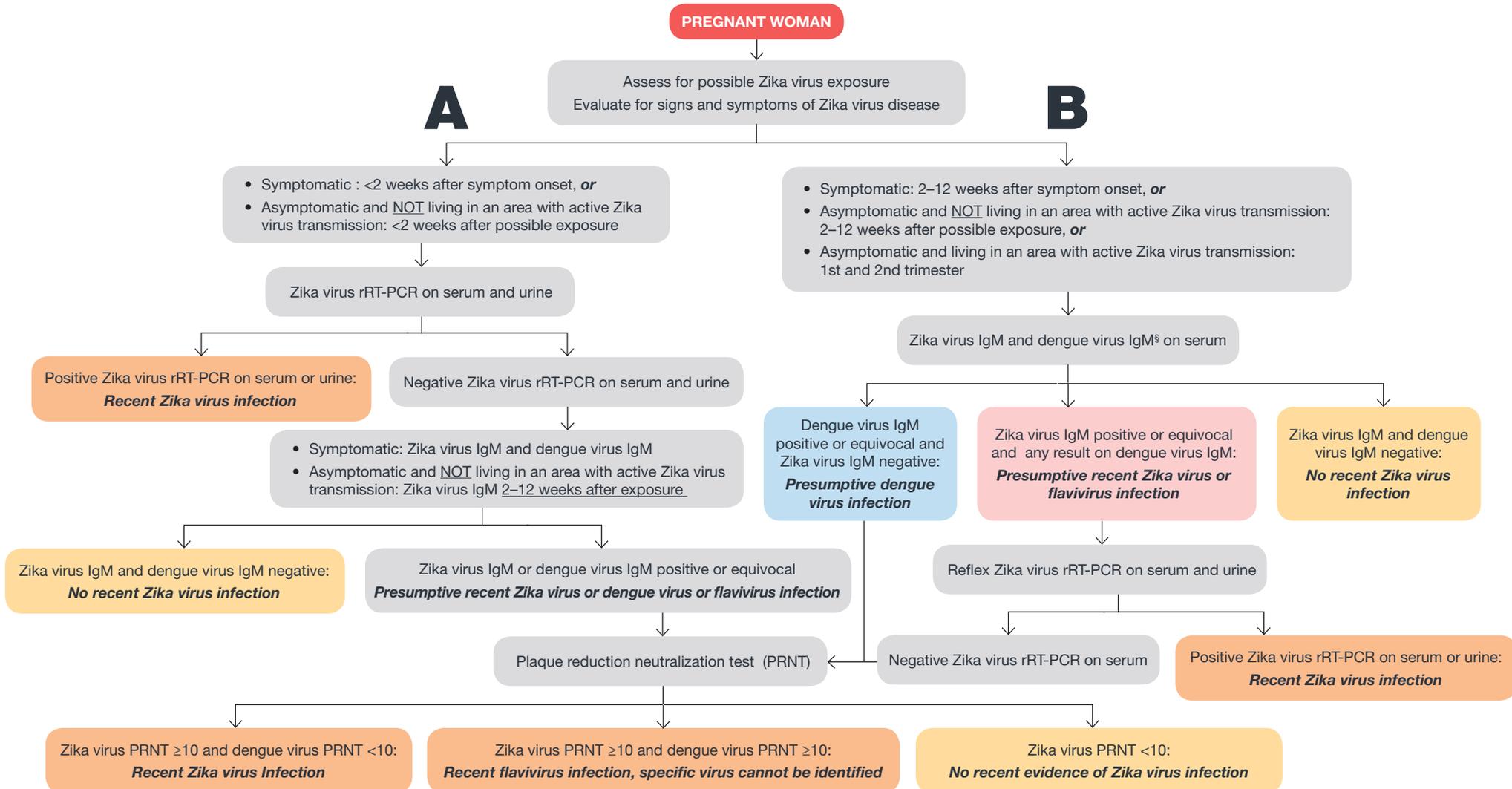
**To help prevent others from getting sick, strictly follow steps to prevent mosquito bites during the first week of illness.**



# UPDATED INTERIM PREGNANCY GUIDANCE:



Testing and interpretation recommendations<sup>†, §, ¶</sup> for a pregnant woman with possible exposure to Zika virus<sup>\*\*</sup> — United States (including U.S. territories)



**Abbreviations:** IgM = immunoglobulin M; PRNT = plaque reduction neutralization test; rRT-PCR = real-time reverse transcription–polymerase chain reaction.

\* A pregnant woman is considered symptomatic if one or more signs or symptoms (fever, rash, arthralgia, or conjunctivitis) consistent with Zika virus disease is reported whereas a pregnant woman is considered asymptomatic if symptoms are NOT reported.

† Testing includes Zika virus rRT-PCR on serum and urine samples, Zika virus and dengue virus Immunoglobulin M (IgM), and plaque reduction neutralization test (PRNT) on serum samples. PRNT results that indicate recent flavivirus infection should be interpreted in the context of the currently circulating flaviviruses. Refer to the laboratory guidance for updated testing recommendations (<http://www.cdc.gov/zika/laboratories/lab-guidance.html>). Because of the overlap of symptoms in areas where other viral illness are endemic, evaluate for possible dengue or chikungunya virus infection.

§ Dengue IgM antibody testing is recommended only for symptomatic pregnant women.

¶ If Zika virus rRT-PCR testing is requested from laboratories without IgM antibody testing capacity or a process to forward specimens to another testing laboratory, storing of additional serum samples is recommended for IgM antibody testing in the event of a rRT-PCR negative result.

\*\* Possible exposure to Zika virus includes travel to or residence in an area with active Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices/>), or sex (vaginal sex (penis-to-vagina sex), anal sex (penis-to-anus sex), oral sex (mouth-to-penis sex or mouth-to-vagina sex), and the sharing of sex toys) without a barrier method to prevent infection (male or female condoms for vaginal or anal sex, male condoms for oral sex (mouth-to-penis), and male condoms cut to create a flat barrier or dental dams for oral sex (mouth-to-vagina) with a partner who traveled to, or lives in an area with active Zika virus transmission.

# Clinical management of a pregnant woman with suspected Zika virus infection

Interpretation of Laboratory Results*	Prenatal Management	Postnatal Management
<b><u>Recent Zika virus infection</u></b>	<ul style="list-style-type: none"> <li>Consider serial ultrasounds every 3–4 weeks to assess fetal anatomy and growth<sup>†</sup></li> <li>Decisions regarding amniocentesis should be individualized for each clinical circumstance<sup>§</sup></li> </ul>	<p><b>LIVE BIRTHS:</b></p> <ul style="list-style-type: none"> <li>Cord blood and infant serum should be tested for Zika virus rRT-PCR, Zika IgM, and dengue virus IgM antibodies. If CSF is obtained for other reasons, it can also be tested.</li> <li>Zika virus rRT-PCR and IHC staining of umbilical cord and placenta is recommended.<sup>¶</sup></li> </ul> <p><b>FETAL LOSSES:</b></p> <ul style="list-style-type: none"> <li>Zika virus rRT-PCR and IHC staining of fetal tissues is recommended.<sup>¶</sup></li> </ul>
<b><u>Recent flavivirus infection; specific virus cannot be identified</u></b>		
<b><u>Presumptive recent Zika virus infection**</u></b>	<ul style="list-style-type: none"> <li>Consider serial ultrasounds every 3–4 weeks to assess fetal anatomy and growth<sup>†</sup></li> <li>Amniocentesis might be considered; decision should be individualized for each clinical circumstance<sup>§</sup></li> </ul>	<p><b>LIVE BIRTHS:</b></p> <ul style="list-style-type: none"> <li>Cord blood and infant serum should be tested for Zika virus rRT-PCR, Zika IgM, and dengue virus IgM antibodies. If CSF is obtained for other reasons, it can also be tested.</li> <li>Zika virus rRT-PCR and IHC staining of umbilical cord and placenta should be considered.<sup>¶</sup></li> </ul> <p><b>FETAL LOSSES:</b></p> <ul style="list-style-type: none"> <li>Zika virus rRT-PCR and IHC staining of fetal tissues should be considered.<sup>¶</sup></li> </ul>
<b><u>Presumptive recent flavivirus infection**</u></b>		
<b><u>Recent dengue virus infection</u></b>	<ul style="list-style-type: none"> <li>Clinical management in accordance with existing guidelines (<a href="http://apps.who.int/iris/bitstream/10665/44188/1/9789241547871_eng.pdf">http://apps.who.int/iris/bitstream/10665/44188/1/9789241547871_eng.pdf</a>).</li> </ul>	
<b><u>No evidence of Zika virus or dengue virus infection</u></b>	<ul style="list-style-type: none"> <li>Prenatal ultrasound to evaluate for fetal abnormalities consistent with congenital Zika virus syndrome.<sup>†</sup> <ul style="list-style-type: none"> <li>Fetal abnormalities present: repeat Zika virus rRT-PCR and IgM test; base clinical management on corresponding laboratory results.</li> <li>Fetal abnormalities absent: base obstetric care on the ongoing risk of Zika virus exposure to the pregnant woman.</li> </ul> </li> </ul>	

**Abbreviations:** CSF = cerebrospinal fluid; IgM = immunoglobulin M; IHC = immunohistochemical; PRNT = plaque reduction neutralization test; rRT-PCR = real-time reverse transcription–polymerase chain reaction.

\* Refer to the previously published guidance for testing interpretation (<http://www.cdc.gov/mmwr/volumes/65/wr/mm6521e1.htm>).

<sup>†</sup> Fetal abnormalities consistent with congenital Zika virus syndrome include microcephaly, intracranial calcifications, ventriculomegaly, arthrogryposis, and abnormalities of the corpus callosum, cerebrum, cerebellum, and eyes.

<sup>§</sup> Health care providers should discuss risks and benefits of amniocentesis with their patients. It is not known how sensitive or specific rRT-PCR testing of amniotic fluid is for congenital Zika virus infection, whether a positive result is predictive of a subsequent fetal abnormality, and if it is predictive, what proportion of infants born after infection will have abnormalities.

<sup>¶</sup> Refer to pathology guidance for collection and submission of fetal tissues for Zika virus testing for detailed information on recommended specimen types (<http://www.cdc.gov/zika/laboratories/test-specimens-tissues.html>).

\*\* rRT-PCR or PRNT should be performed for positive or equivocal IgM results as indicated. PRNT results that indicate recent flavivirus infection should be interpreted in the context of the currently circulating flaviviruses. Refer to the laboratory guidance for updated testing recommendations (<http://www.cdc.gov/zika/laboratories/lab-guidance.html>). Because of the overlap of symptoms and areas where other viral illnesses are endemic, evaluate for possible dengue or chikungunya virus infection.



# Recommendations for Zika Virus Testing and Follow-Up

Updated on August 25, 2016

## Background

Zika virus is a flavivirus that is transmitted to humans primarily by *Aedes* species mosquitoes; in the Americas, *Aedes aegypti*, is the most common vector. Other documented modes of transmission include intrauterine resulting in congenital infection, intrapartum from a viremic mother to her newborn, sexual, blood transfusion and laboratory exposure. Only about 1 in 5 people who are infected with Zika virus show symptoms. In those that do, the most common symptoms are fever, rash, joint pain, and conjunctivitis. Human disease has been seen in Africa, Asia, and the Pacific islands. In May 2015, the first locally-acquired cases in the Americas were reported in Brazil. Since then, local transmission has been reported in many countries in the Americas and several U.S. territories, including Puerto Rico, the U.S. Virgin Islands, and American Samoa (<http://wwwnc.cdc.gov/travel/page/zika-information>).

The first case of sexual transmission documented in the United States occurred in Dallas, Texas, in February 2016. Since that time, the U.S. Centers for Disease Control and Prevention (CDC) has reported additional cases from both men and women to their sexual partners. For guidance on prevention of sexual transmission of Zika virus, visit

[http://www.cdc.gov/mmwr/volumes/65/wr/mm6529e2.htm?s\\_cid=mm6529e2](http://www.cdc.gov/mmwr/volumes/65/wr/mm6529e2.htm?s_cid=mm6529e2).

In Brazil, a substantial increase in the number of infants born with microcephaly was noted in 2015, and Zika virus infection has been identified in several infants born with microcephaly and other fetal losses. In March 2016, CDC published outcomes of Zika virus infection among nine U.S. pregnant travelers; all of these women had one or more symptoms. Five of six women who reported symptoms during the first trimester had poor pregnancy outcomes, including miscarriages (2), elective terminations (2), and microcephaly (1) (<http://www.cdc.gov/mmwr/volumes/65/wr/mm6508e1.htm>).

In May 2016, the CDC reviewed the evidence that Zika virus causes birth defects and determined that there is a causal association between Zika virus infection and adverse pregnancy outcomes (Rasmussen SA et al. *N Engl J Med* 2016;374:1981-1987). Therefore, CDC is recommending that pregnant women avoid traveling to areas with ongoing Zika virus transmission, if at all possible. Women who traveled to these areas while pregnant should be evaluated according to the guidance found at the following websites. The websites include recommendations for women who want to get pregnant after recent travel to an area with active Zika virus transmission.

<http://www.cdc.gov/mmwr/volumes/65/wr/mm6512e2.htm>



[http://www.cdc.gov/mmwr/volumes/65/wr/mm6529e1.htm?s\\_cid=mm6529e1\\_e](http://www.cdc.gov/mmwr/volumes/65/wr/mm6529e1.htm?s_cid=mm6529e1_e)

In August 2016, the Florida Department of Health reported local mosquito-borne transmission of Zika virus by the *Aedes aegypti* in two areas of Miami-Dade County; the Wynwood neighborhood and a section of Miami Beach. The CDC is recommending that pregnant women avoid travel to this area if at all possible. For more information about local transmission in Florida, visit

<http://www.cdc.gov/zika/intheus/florida-update.html>.

## Zika-Affected Areas/ Travel Information

Travel-related recommendations will be updated by CDC as needed, and travelers should consult the following website to find out the latest advisories: <http://wwwnc.cdc.gov/travel/page/zika-travel-information>

## Recommendations for Diagnostic Testing for Zika

Diagnostic testing for Zika virus is recommended for the following persons who have traveled to an area with Zika virus transmission or have had unprotected sex with a person who has recently traveled to such an area: 1) a person who is experiencing symptoms of Zika virus; and 2) a pregnant woman (with or without symptoms) who may have been exposed. Symptoms only occur in about 1 in 5 people and include fever, rash, joint pain, conjunctivitis (red eyes), muscle pain, and headache (<http://www.cdc.gov/zika/symptoms/>). Symptoms typically begin within a few days after being bitten by an infected mosquito. Diagnostic testing is not recommended for asymptomatic men, asymptomatic non-pregnant women, and children.

<http://www.cdc.gov/zika/hc-providers/testing-for-zikavirus.html>

## Follow-up of Pregnant Women and Infants

For pregnant women where exposure to Zika virus is a real concern, the clinician should follow the pregnancy with serial fetal ultrasounds and other tests to detect abnormalities regardless of the initial Zika virus test results. If fetal abnormalities are detected later in pregnancy, then Zika virus testing should be repeated. Interim guidance for evaluation and testing of infants with microcephaly or intracranial calcifications whose mothers traveled to or resided in an area with Zika virus transmission during pregnancy can be found at <http://www.cdc.gov/mmwr/volumes/65/wr/mm6533e2.htm>. [If the clinical provider has questions regarding further testing of pregnant women or infants, please contact the UDOH, Bureau of Epidemiology at 801-538-6191.](#)

If a pregnant woman has a partner who lives in or traveled to an area with active Zika virus transmission, the couple should correctly and consistently use condoms or abstain from sex **for the duration of the woman's pregnancy regardless of Zika test results**. Sex includes vaginal, anal and oral sex and the



sharing of sex toys. Zika virus has been detected in semen long after the virus is no longer present in blood.

Pregnant women who test positive for Zika virus will be followed up by public health at labor and delivery to determine pregnancy outcomes. The infant will also be followed to determine outcomes that may not have been readily apparent at birth.

### **Couples Planning Pregnancy**

Couples in which the man has traveled to an area with active Zika virus transmission should postpone pregnancy for 6 months if the man is symptomatic and 2 months if the man is asymptomatic, regardless of Zika test results. If the woman has traveled to an area with active Zika virus transmission, then pregnancy should be postponed for 2 months, regardless of Zika virus test results.

### **Zika Laboratory Testing Information**

- Approved laboratory tests for Zika virus infection diagnosis include a combination of polymerase chain reaction (RT-PCR), Zika virus IgM antibody, and plaque reduction neutralization antibody tests (PRNT). The Trioplex RT-PCR test, available at some state laboratories and CDC, allows for testing of serum and cerebrospinal fluid (CSF) for Zika virus, chikungunya, and dengue. Urine and amniotic fluid can be used to detect Zika virus only. The Zika IgM-ELISA is also available at some state laboratories, commercial laboratories, and CDC, and can be used to test serum and CSF specimens. PRNT testing on serum is confirmatory and is available at CDC and some state laboratories; these tests can measure virus-specific neutralizing antibody titers to determine the cause of primary flavivirus infection. Given the overlap of symptoms and endemic areas with other arboviral illnesses, patients should also be evaluated for other possible flavivirus infections. There may be serological cross-reactivity among the flaviviruses and current IgM antibody assays may not reliably distinguish between Zika virus and dengue virus infections. CDC has been looking for cross-reactivity on recent samples submitted for Zika virus testing and has found that the Zika virus IgM MAC-ELISA test is performing better than expected.
- Currently, the Utah Public Health Laboratory (UPHL) performs the Zika virus IgM MAC-ELISA and the Trioplex RT-PCR tests. Equivocal or inconclusive IgM test results will be sent to the CDC laboratory in Fort Collins, CO, for confirmation, including PRNT testing. If testing cannot be confirmed at UPHL, the specimen will be sent to CDC in Fort Collins for confirmatory testing.
- In patients who have been immunized against yellow fever or Japanese encephalitis virus or who have been 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. Because antibody tests may cross-react with other flaviviruses (e.g., dengue, yellow fever, or Japanese B encephalitis) and produce false positives, it is recommended the patient be tested for these viruses as well.

CDC is currently performing dengue and chikungunya antibody tests on Zika virus IgM-positive specimens only. If clinicians need to rule out these infections regardless of Zika virus results, these tests are available through commercial laboratories.

- Acute serum collected within the first 14 days following symptom onset should be tested by RT-PCR. IgM antibodies may be detectable by day 4 of illness but this test is more reliable later in the course of infection. For persons whose infections are equivocal on IgM, paired acute and convalescent specimens, collected 2-4 weeks apart, may be necessary to confirm or rule-out infection.
- Serum collected between 2 to 12 weeks following symptom onset should be tested by IgM.
- Urine specimens may be collected within the first 14 days following symptom onset and should be tested by PCR. Urine specimens must always be accompanied with a serum sample.
- Consultation about laboratory testing is available through the Utah Department of Health (UDOH) State Epidemiologist, Medical Officer on call at the Utah Department of Health, or local public health department (see contact information below).

### **Requesting laboratory testing in Utah**

- At this time, Zika virus testing for Utah residents will be performed at UPHL free of charge. However, testing capacity may be limited; therefore, UPHL and CDC are requesting that the State Epidemiologist, Medical Officer on-call at the UDOH, or the local public health department approve testing requests. **To discuss testing, please contact your local health department or UDOH, Bureau of Epidemiology at 801-538-6191.** Visit [http://www.cdc.gov/mmwr/volumes/65/wr/mm6521e1.htm?s\\_cid=mm6521e1\\_w#T1](http://www.cdc.gov/mmwr/volumes/65/wr/mm6521e1.htm?s_cid=mm6521e1_w#T1) down for Interim Guidance for Interpretation of Zika Virus Antibody Test Results.

### **Serum specimen collection and transport**

General Instructions	Storage	Shipping
Collect serum (≥ 3 mL) in a large serum separator tube.	Samples collected and shipped with expected arrival the same day can be shipped on cold packs (4°C); not frozen.	If storage/transport will exceed 24 hours, serum should be frozen at -20°C or lower.  Ship samples on dry ice to UPHL.

### **Urine specimen collection and transport**

General Instructions	Storage	Shipping
Provide 1.0 mL of urine in a 1.8 mL cryotube or 2.0 mL microtube with sterile screw capped vial secured with thermoplastic, self-sealing lab film.	For RT-PCR testing, specimens should be kept cold (2–6 °C) if shipped within 24 hours or frozen (-70 °C) for storage and shipping greater than 24 hours.  For virus isolation testing, specimens should be frozen (-70°C) as soon as possible.	Urine specimens should always be accompanied with a serum specimen.



## Collecting & submitting specimens for Zika virus testing at time of birth

Specimen Type	General Instructions	Storage	Shipping
<b>Infant serum (with in first 2 days of life)</b>	At least 1.0 ml Transfer serum to a plastic tube measuring approximately 50 mm tall and 15 mm in diameter (e.g., 1.8 mL cryotube or 2.0 mL microtube) with screw cap and secure with thermoplastic, self-sealing lab film.	For cold specimens, the sample should be placed in an insulated container with adequate ice packs to ensure specimen (cold chain) integrity.  For frozen specimens, ship the sample on enough dry ice to ensure specimens remain frozen until received.	If storage/transport will exceed 24 hours, serum should be frozen at -20°C or lower.  Ship samples on dry ice to UPHL.
<b>Infant urine (with in first 2 days of life)</b>	Provide 1.0 mL of urine in a 1.8 mL cryotube or 2.0 mL microtube with sterile screw capped vial secured with thermoplastic, self-sealing lab film.	For RT-PCR testing, specimens should be kept cold (2–6 °C) if shipped within 24 hours or frozen (-70 °C) for storage and shipping greater than 24 hours.  For virus isolation testing, specimens should be frozen (-70°C) as soon as possible.	Urine specimens should always be accompanied with a serum specimen.
<b>Placenta and fetal membranes<sup>1</sup></b>	Collect a minimum of (3) 0.5-1 x 3-4 cm in depth) from middle third of placental disk and at least 1 from the placental disk margin.  Label all specimens to identify location of sample.	Tissues should be placed into two sterile containers containing adequate formalin.  Formalin should be about 10x mass of tissue. Place in 10% neutral buffered formalin for a minimum of 3 days.  Once fully fixed, tissue can be transferred to 70% ethanol for long-term storage.	At least one formalin fixed (wet) or formalin-fixed paraffin-embedded (FFPE) placental tissue sample should be stored and sent at room temperature to UPHL.
<b>Umbilical cord<sup>1</sup></b>	Collect a minimum of (4) 0.25 cm squares from the umbilical cord.  Umbilical cord segments should be obtained proximal middle, and distal to umbilical cord insertion site on the placenta.  Label all specimens to identify location of sample.	Fresh tissues should be placed into two sterile containers.  Formalin should be about 10x mass of tissue. Place in 10% neutral buffered formalin for a minimum of 3 days.  Once fully fixed, tissue can be transferred to 70%	At least one formalin fixed (wet) or formalin-fixed paraffin-embedded (FFPE) umbilical cord tissue sample should be stored and sent at room temperature to UPHL.

		ethanol for long term storage.	
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Notes

<sup>¶</sup>Generally considered at less than 12 weeks gestational age

<sup>⊥</sup>Considered at any gestation for which placenta is available

<sup>‡</sup>Considered upon fetal demise

Refer to the following websites for more information.

- <http://www.cdc.gov/zika/hc-providers/tissue-collection-submission.html>
- <http://www.cdc.gov/zika/hc-providers/test-specimens-at-time-of-birth.html>

Follow packaging and shipping instructions for Category B, Biological Substances.

**Laboratory Forms Required for Testing by UPHL and CDC**

The Infectious Disease Test Request Form should be securely emailed or faxed to UDOH and accompany the original with the specimen to Utah Public Health Lab (UPHL). The UPHL form is available at <http://health.utah.gov/epi/diseases/zika>. If a provider needs assistance with completing the form, work with the local health department (LHD) or UDOH epidemiology staff. Additional forms may be required if confirmation testing is necessary. Samples with incomplete information will result in delayed testing and reporting of results. Answers to questions about specimen types or shipping can be found at:

<http://www.cdc.gov/ncezid/dvbd/specimensub/arboviral-shipping.html>

- Arrangements must be made with the UDOH or LHD for specimen shipping and delivery to the UPHL in advance.
- Turnaround time for preliminary results is 7-10 days. If the samples must be sent to CDC for confirmation, turnaround time is 21-28 days.



# INFECTIOUS DISEASE TEST REQUEST FORM

<b>UTAH PUBLIC HEALTH LABORATORY</b> 4431 SOUTH 2700 WEST TAYLORSVILLE, UTAH 84129 TELEPHONE: (801) 965-2400 FAX: (801) 965-2551 <a href="http://health.utah.gov/lab/infectious-diseases">http://health.utah.gov/lab/infectious-diseases</a>	FOR UPHL USE ONLY   LAB# _____ DATE STAMP _____
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PLEASE PRINT CLEARLY FOR ACCURACY.

<b>PATIENT INFORMATION:</b>					
PATIENT STATE OF RESIDENCE: <b>UT</b>	PATIENT COUNTY OF RESIDENCE:	ZIP CODE:	DATE OF BIRTH (mm/dd/yyyy) ____/____/____	AGE	SEX M F

PATIENT NAME (Last, First):	Is Patient Insured? [ ] Yes [ ] No	STI TESTING ONLY: Is patient MSM? [ ] Yes [ ] No
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PATIENT ID # (public health)	ETHNICITY [ ] Hispanic [ ] Non-Hispanic	RACE [ ] White [ ] Black or African American [ ] American Indian or Alaska Native [ ] Asian [ ] Native Hawaiian or other Pacific Islander
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<b>PROVIDER INFORMATION</b> Provider Code: _____ Physician: _____ Provider Phone: _____ Provider Email: _____ Secure Fax #: _____	<b>SPECIMEN COLLECTION DATE AND TIME</b> (mm/dd/yy) ____/____/____ Time: _____
--	--

<b>SPECIMEN SOURCE/SITE (CHOOSE 1):</b>			
<input type="checkbox"/> Blood	<input type="checkbox"/> Environmental (specify): _____	<input type="checkbox"/> Plasma	<input type="checkbox"/> Urethra
<input type="checkbox"/> Body Fluid (specify): _____	<input type="checkbox"/> Food (specify): _____	<input type="checkbox"/> Rectum	<input type="checkbox"/> Urine
<input type="checkbox"/> Bronchoalveolar lavage	<input type="checkbox"/> Isolate (source): _____	<input checked="" type="checkbox"/> Serum	<input type="checkbox"/> Vagina
<input type="checkbox"/> Bronchial aspirate/wash	<input type="checkbox"/> Lesion (site): _____	<input type="checkbox"/> Sputum (natural / induced)	<input type="checkbox"/> Vomitus
<input type="checkbox"/> Cerebrospinal Fluid	<input type="checkbox"/> Liquid Pap	<input type="checkbox"/> Stool	<input type="checkbox"/> Wound/Abcess
<input type="checkbox"/> Cervix	<input type="checkbox"/> Nasal (aspirate /swab / wash)	<input type="checkbox"/> Throat swab	<input type="checkbox"/> Other (specify): _____
<input type="checkbox"/> (Endo)tracheal aspirate/wash	<input type="checkbox"/> Nasopharyngeal swab	<input type="checkbox"/> Tissue (specify): _____	

<b>BACTERIOLOGY/TUBERCULOSIS TESTS</b>	<b>VIROLOGY / IMMUNOLOGY TESTS</b>
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<b>Bacteriology Specimen</b> <b>REQUIRED Shipping Temperature:</b> _____ <input type="checkbox"/> Bacterial Culture <input type="checkbox"/> Bacterial ID / Referral Presumptive ID: _____ <input type="checkbox"/> Mycobacterial culture <input type="checkbox"/> Mycobacterial referral Presumptive ID: _____ <input type="checkbox"/> Other (specify): _____	<input type="checkbox"/> C. trachomatis and N. gonorrhea by NAAT <input type="checkbox"/> Patient is a partner of a 15-24 year old female  <input type="checkbox"/> Herpes/VZV PCR (HSV-1, HSV-2, VZV)  <input checked="" type="checkbox"/> Virus Identification Virus suspected _____ <u>ZIKA</u>  <input type="checkbox"/> Cytomegalovirus  <input type="checkbox"/> Varicella zoster virus	<input type="checkbox"/> QuantIFERON-TB Gold <b>REQUIRED information:</b> Blood draw date/time: _____ Incubation at 37°C completed? [ ] Yes [ ] No Signature: _____ Incubation start date/time: _____ Incubation end date/time: _____  <input type="checkbox"/> Syphilis IgG EIA (includes confirmatory testing) <input type="checkbox"/> RPR (suspect acute infection/previous positive)  <input type="checkbox"/> HIV Antigen/Antibody (includes confirm. testing) <input type="checkbox"/> Previous positive  <input type="checkbox"/> Hepatitis C Antibody <input type="checkbox"/> Add HCV RNA Testing if Positive  <input type="checkbox"/> Hepatitis C RNA (Qualitative; Antibody screen not included)  <input type="checkbox"/> Hepatitis B Antibody  <input type="checkbox"/> Hepatitis B Antigen  <input type="checkbox"/> Hantavirus (Sin Nombre) IgG/IgM <input type="checkbox"/> Acute Serum (mm/dd/yy) ____/____/____ <input type="checkbox"/> Convalescent serum (mm/dd/yy) ____/____/____
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<b>BIOTERRORISM TESTS</b>		
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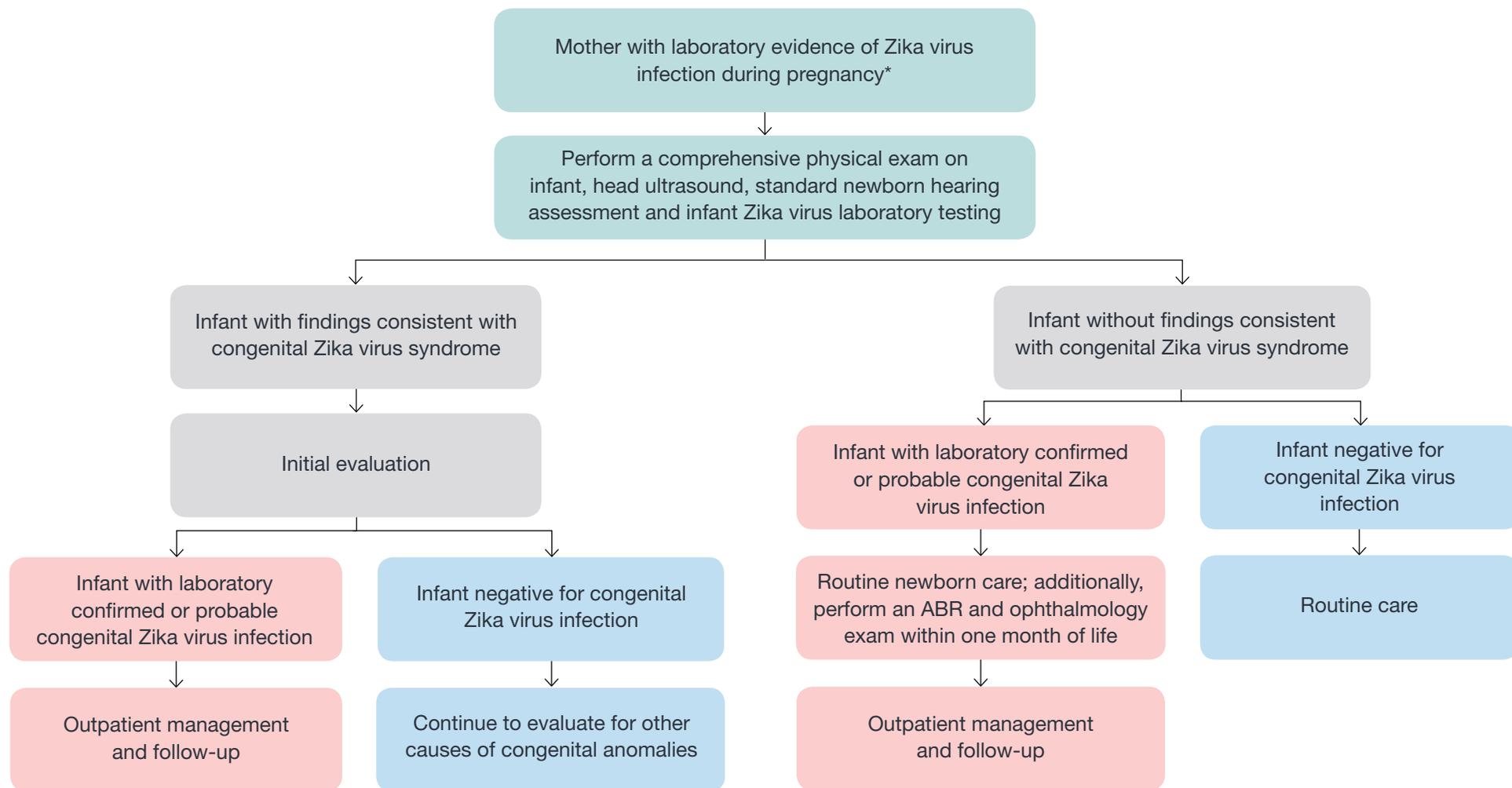
<b>(Notify Lab before submitting)</b> <input type="checkbox"/> Bacillus anthracis Detection/Identification <input type="checkbox"/> Brucella species Detection/Identification <input type="checkbox"/> Brucella antibody <input type="checkbox"/> Burkholderia mallei/pseudomallei Detection/ID <input type="checkbox"/> Clostridium botulinum culture & toxin <input type="checkbox"/> Coxiella burnetii Detection <input type="checkbox"/> Francisella tularensis Detection/Identification <input type="checkbox"/> F. tularensis antibody <input type="checkbox"/> Orthopox viruses Detection Virus Suspected: <input type="checkbox"/> Vaccinia virus <input type="checkbox"/> Varicella zoster virus <input type="checkbox"/> Variola virus <input type="checkbox"/> Yersinia pestis Detection/Identification <input type="checkbox"/> Yersinia pestis antibody <input type="checkbox"/> Other (specify): _____	<input type="checkbox"/> Multi-Pathogen Respiratory Panel (Includes Adenovirus, Coronavirus, Human Metapneumovirus, Rhino/Enterovirus, Influenza A, Influenza B, Parainfluenza 1-4, RSV, Bordetella pertussis, C. pneumoniae, M. pneumoniae)  <input type="checkbox"/> Influenza A & B virus PCR (with subtyping) <input type="checkbox"/> Hospitalized w/ Influenza-like illness <input type="checkbox"/> Other (i.e., cluster investigation) Cluster location: _____ Other reason for testing: _____  <input type="checkbox"/> West Nile virus IgM (Human)	
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<b>ADDITIONAL INFORMATION</b>	
[ ] Other Disease Suspected: _____	[ ] Referral Test to CDC (form <b>REQUIRED</b> ) specify: _____ Contact UPHL for CDC form

**COMMENTS:**



**Evaluation and testing of infants with possible congenital Zika virus infection**



\*Laboratory evidence of maternal Zika virus infection includes: (1) Zika virus RNA detected by real-time reverse transcription-polymerase chain reaction (rRT-PCR) in any clinical specimen; or (2) positive Zika virus immunoglobulin M (IgM) with confirmatory neutralizing antibody titers. Mother's should be tested by rRT-PCR within 2 weeks of exposure or symptom onset, or IgM within 2-12 weeks of exposure or symptom onset. Due to the decline in IgM antibody and viral RNA levels over time, negative maternal testing 12 weeks after exposure does not rule out maternal infection.

Abbreviation: ABR = auditory brainstem response.

**More information on the evaluation, management, and follow-up of infants with possible congenital Zika virus infection is available at [www.cdc.gov/zika/hc-providers/infants-children.html](http://www.cdc.gov/zika/hc-providers/infants-children.html).**



U.S. Department of Health and Human Services  
 Centers for Disease Control and Prevention

# CHAMPION REPORTING FORM UTAH BIRTH DEFECTS NETWORK

## Maternal Information

Name: \_\_\_\_\_ Birthday: \_\_\_\_\_

Delivery Hospital: \_\_\_\_\_ Hospital Chart #: \_\_\_\_\_

## Infant Information

Name: \_\_\_\_\_ Birthday: \_\_\_\_\_

Primary Care Physician: \_\_\_\_\_ Sex: M F

- |   |  |
|---|--|
| <input type="checkbox"/> Neural Tube Defects  | <input type="checkbox"/> Hypospadias/Epispadias    |
| <input type="checkbox"/> Microcephaly   | <input type="checkbox"/> Renal agenesis/dysgenesis |
| <input type="checkbox"/> Craniosynostosis   | <input type="checkbox"/> Cystic Kidney             |
| <input type="checkbox"/> Dandy-Walker Malformation  | <input type="checkbox"/> Hydronephrosis            |
| <input type="checkbox"/> Hydrocephalus  | <input type="checkbox"/> Obstructive GU defects    |
| <input type="checkbox"/> Holoprosencephaly  | <input type="checkbox"/> Bladder Extrophy          |
| <input type="checkbox"/> Anophthalmia/Microphthalmia  | <input type="checkbox"/> Anotia/Microtia           |
| <input type="checkbox"/> Congenital Cataract  | <input type="checkbox"/> Diaphragmatic Hernia      |
| <input type="checkbox"/> Aniridia   | <input type="checkbox"/> Amniotic Bands            |
| <input type="checkbox"/> Choanal Atresia  | <input type="checkbox"/> Arthrogyposis             |
| <input type="checkbox"/> Lung Agenesis/hypoplasia   | <input type="checkbox"/> Limb Reduction Defect     |
| <input type="checkbox"/> Oral Facial Cleft  | <input type="checkbox"/> Abdominal Wall Defect     |
| <input type="checkbox"/> Gastrointestinal Defects:<br>TE Fistula<br>Esophageal atresia<br>Intestinal atresia/stenosis<br>Hirschsprungs<br>Biliary atresia | <input type="checkbox"/> Skeletal Dysplasia        |
| <input type="checkbox"/> Pyloric Stenosis   | <input type="checkbox"/> Chromosome Defect: _____  |
|   | <input type="checkbox"/> Other CNS Malformations   |
|   | <input type="checkbox"/> Other/Code: _____         |

Reporting Source: \_\_\_\_\_ Date: \_\_\_\_\_

P.O.Box 144693  
Salt Lake City, Utah 84114-4693  
801-883-4661  
Fax: 801-883-4668



UTAH DEPARTMENT OF  
**HEALTH**

Utah Birth Defect Network

## Update: Interim Guidance for Health Care Providers Caring for Pregnant Women with Possible Zika Virus Exposure — United States, July 2016

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CDC has updated its interim guidance for U.S. health care providers caring for pregnant women with possible Zika virus exposure, to include the emerging data indicating that Zika virus RNA can be detected for prolonged periods in some pregnant women. To increase the proportion of pregnant women with Zika virus infection who receive a definitive diagnosis, CDC recommends expanding real-time reverse transcription–polymerase chain reaction (rRT-PCR) testing. Possible exposures to Zika virus include travel to or residence in an area with active Zika virus transmission, or sex\* with a partner who has traveled to or resides in an area with active Zika virus transmission without using condoms or other barrier methods to prevent infection.† Testing recommendations for pregnant women with possible Zika virus exposure who report clinical illness consistent with Zika virus disease<sup>§</sup> (symptomatic pregnant women) are the same, regardless of their level of exposure (i.e., women with ongoing risk for possible exposure, including residence in or frequent travel to an area with active Zika virus transmission, as well as women living in areas without Zika virus transmission who travel to an area with active Zika virus transmission, or have unprotected sex with a partner who traveled to or resides in an area with active Zika virus transmission). Symptomatic pregnant women who are evaluated <2 weeks after symptom onset should receive serum and urine Zika virus rRT-PCR

testing. Symptomatic pregnant women who are evaluated 2–12 weeks after symptom onset should first receive a Zika virus immunoglobulin (IgM) antibody test; if the IgM antibody test result is positive or equivocal, serum and urine rRT-PCR testing should be performed. Testing recommendations for pregnant women with possible Zika virus exposure who do not report clinical illness consistent with Zika virus disease (asymptomatic pregnant women) differ based on the circumstances of possible exposure. For asymptomatic pregnant women who live in areas without active Zika virus transmission and who are evaluated <2 weeks after last possible exposure, rRT-PCR testing should be performed. If the rRT-PCR result is negative, a Zika virus IgM antibody test should be performed 2–12 weeks after the exposure. Asymptomatic pregnant women who do not live in an area with active Zika virus transmission, who are first evaluated 2–12 weeks after their last possible exposure should first receive a Zika virus IgM antibody test; if the IgM antibody test result is positive or equivocal, serum and urine rRT-PCR should be performed. Asymptomatic pregnant women with ongoing risk for exposure to Zika virus should receive Zika virus IgM antibody testing as part of routine obstetric care during the first and second trimesters; immediate rRT-PCR testing should be performed when IgM antibody test results are positive or equivocal. This guidance also provides updated recommendations for the clinical management of pregnant women with confirmed or possible Zika virus infection. These recommendations will be updated when additional data become available.

### Introduction

Zika virus continues to spread worldwide, and as of July 21, 2016, 50 countries and territories reported active Zika virus

\* Sex is specifically defined as vaginal sex (penis-to-vagina sex), anal sex (penis-to-anus sex), oral sex (mouth-to-penis sex or mouth-to-vagina sex), and the sharing of sex toys.

† Barrier methods include male or female condoms for vaginal or anal sex, male condoms for oral sex (mouth-to-penis), and male condoms cut to create a flat barrier or dental dams for oral sex (mouth-to-vagina).

§ Zika virus disease is defined as having at least one of the following signs or symptoms: acute onset of fever, rash, arthralgia, conjunctivitis, and laboratory confirmation of Zika virus infection.



transmission (locations with mosquitoes transmitting Zika virus to persons in the area).<sup>¶</sup> Although most persons with Zika virus infection are asymptomatic or have mild clinical disease, infection during pregnancy can cause congenital microcephaly and other brain defects (1). Zika virus has also been linked to other adverse pregnancy outcomes, including miscarriage and stillbirth (1,2). The U.S. Zika Pregnancy Registry (USZPR)\*\* and the Puerto Rico Zika Active Pregnancy Surveillance System (ZAPSS)<sup>††</sup> were established in collaboration with state, tribal, local, and territorial health departments to monitor pregnant women with confirmed or possible Zika virus infection to determine the risk for Zika virus infection during pregnancy and the spectrum of conditions associated with congenital Zika virus infection (3). As of July 14, 2016, a total of 400 women in the 50 U.S. states and the District of Columbia, and 378 women in all U.S. territories (aggregated territories' data from the USZPR and ZAPSS) were determined to have laboratory evidence of confirmed or possible Zika virus infection during pregnancy.<sup>§§</sup>

Data from the USZPR and published case reports indicate that Zika virus RNA can persist in serum of some pregnant women longer than had been previously reported; the longest documented duration of Zika virus RNA detection in serum is 10 weeks after symptom onset (4–7). In addition, recent data indicate that Zika virus RNA might be detected in the serum or urine of some asymptomatic pregnant women (7). The frequency of this finding is unknown, but the detection of Zika virus RNA in serum or urine provides a definitive diagnosis of Zika virus infection. Preliminary data suggest that plaque reduction neutralization testing (PRNT) might not discriminate between Zika virus and other flavivirus infections, particularly in persons with previous flavivirus exposure (8), which complicates interpretation of serologic testing (IgM antibody test and PRNT). Given these challenges, expanded rRT-PCR testing might provide a definitive diagnosis for more pregnant women who are infected with Zika virus.

CDC has revised its interim guidance for U.S. health care providers caring for pregnant women with possible Zika virus exposure. The revised testing recommendations extend the timeframe for rRT-PCR testing of serum and include rRT-PCR testing for some asymptomatic pregnant women. CDC continues to evaluate all available evidence and will update recommendations as new information becomes available.

<sup>¶</sup> <http://www.cdc.gov/zika/geo/active-countries.html>.

\*\* <http://www.cdc.gov/zika/hc-providers/registry.html>.

†† <http://www.cdc.gov/zika/public-health-partners/zapss.html>.

§§ <https://www.cdc.gov/zika/geo/pregwomen-uscases.html>.

## Updated Recommendations for Evaluating and Testing of Pregnant Women with Possible Zika Virus Exposure

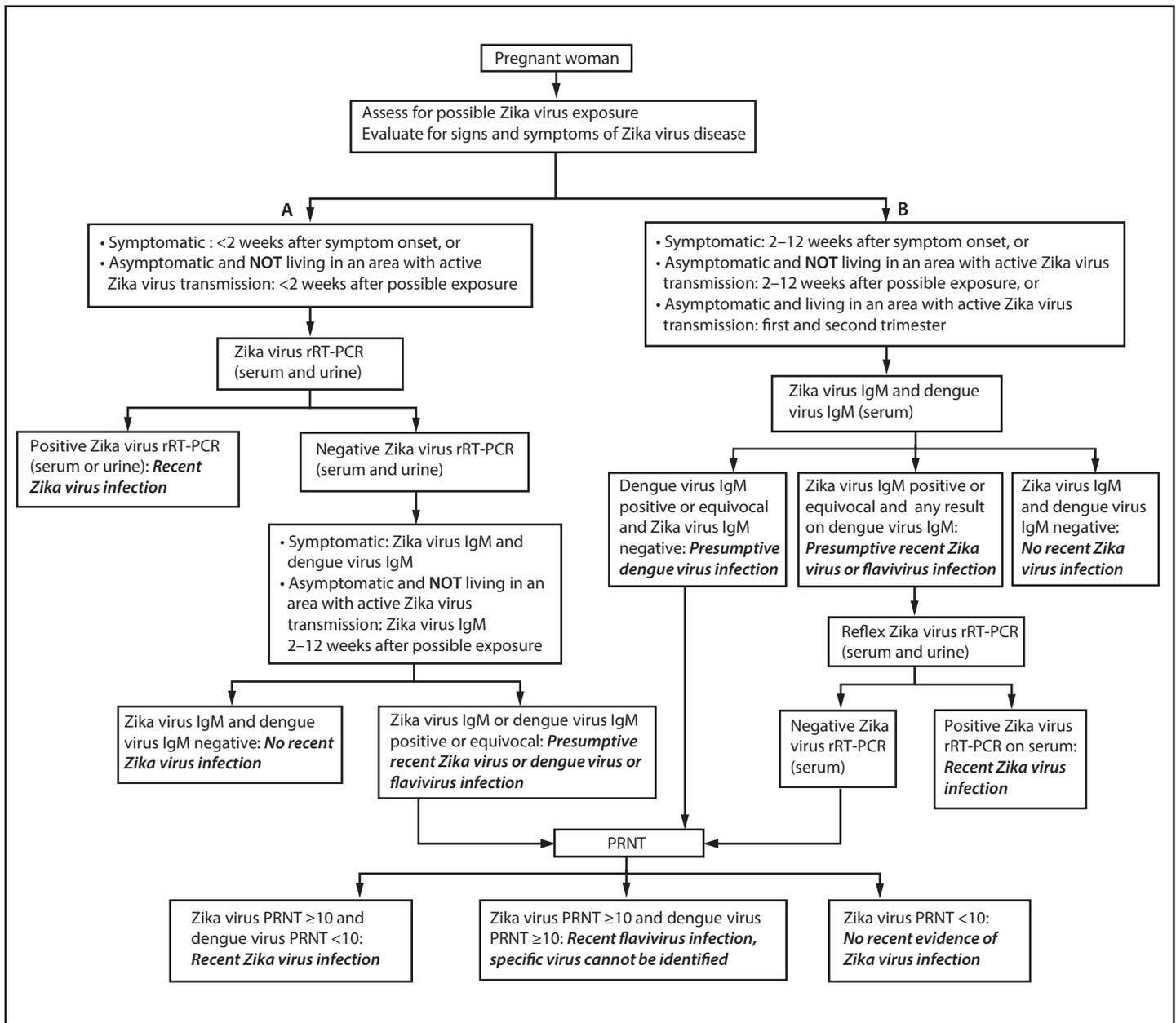
All pregnant women in the United States and U.S. territories should be assessed for possible Zika virus exposure at each prenatal care visit. CDC recommends that pregnant women not travel to an area with active Zika virus transmission (9,10). Pregnant women who must travel to one of these areas should strictly follow steps to prevent mosquito bites during the trip.<sup>¶¶</sup> In addition, it is recommended that pregnant women with a sex partner who has traveled to or lives in an area with active Zika virus transmission use condoms or other barrier methods to prevent infection or abstain from sex for the duration of the pregnancy (11).

**Symptomatic pregnant women.** Pregnant women who report signs or symptoms consistent with Zika virus disease (acute onset of fever, rash, arthralgia, conjunctivitis) should be tested for Zika virus infection (Figure). The testing recommendations for symptomatic pregnant women are the same regardless of the circumstances of possible exposure; however, the type of testing recommended varies depending on the time of evaluation relative to symptom onset. Testing of serum and urine by rRT-PCR is recommended for pregnant women who seek care <2 weeks after symptom onset. This recommendation extends the previous recommendation for testing of serum from <1 week after symptom onset to <2 weeks (Figure). A positive rRT-PCR result confirms the diagnosis of recent maternal Zika virus infection. Symptomatic pregnant women with negative rRT-PCR results should receive both Zika virus IgM and dengue virus IgM antibody testing. If Zika virus rRT-PCR testing is requested from laboratories that do not have IgM antibody testing capacity or a process to forward specimens to another testing laboratory, storing of additional serum samples is recommended for IgM antibody testing in the event of a negative rRT-PCR result (12). If either the Zika virus or dengue virus IgM antibody test yields positive or equivocal results, PRNT should be performed on the same IgM-tested sample or a subsequently collected sample to rule out false-positive results (8).

Symptomatic pregnant women who seek care 2–12 weeks after symptom onset should first receive Zika virus and dengue virus IgM antibody testing (Figure). If the Zika virus IgM antibody testing yields positive or equivocal results, reflex rRT-PCR testing should be automatically performed on the same serum sample to determine whether Zika virus RNA is present. A positive rRT-PCR result confirms the diagnosis of recent

<sup>¶¶</sup> <http://wwwnc.cdc.gov/travel/page/avoid-bug-bites>.

**FIGURE. Updated interim guidance: testing and interpretation recommendations<sup>\*,†,§,¶</sup> for a pregnant woman with possible exposure to Zika virus<sup>\*\*</sup> — United States (including U.S. territories)**



**Abbreviations:** IgM = immunoglobulin M; PRNT = plaque reduction neutralization test; rRT-PCR = real-time reverse transcription–polymerase chain reaction.

\* A pregnant woman is considered symptomatic if one or more signs or symptoms (acute onset of fever, rash, arthralgia, or conjunctivitis) consistent with Zika virus disease is reported. A pregnant woman is considered asymptomatic if these symptoms are not reported.

† Testing includes Zika virus rRT-PCR on serum and urine samples, Zika virus and dengue virus IgM, and PRNT on serum samples. PRNT results that indicate recent flavivirus infection should be interpreted in the context of the currently circulating flaviviruses. Refer to the laboratory guidance for updated testing recommendations (<http://www.cdc.gov/zika/laboratories/lab-guidance.html>). Because of the overlap of symptoms in areas where other viral illness are endemic, evaluate for possible dengue or chikungunya virus infection.

§ Dengue virus IgM antibody testing is recommended only for symptomatic pregnant women.

¶ If Zika virus rRT-PCR testing is requested from laboratories without IgM antibody testing capacity or a process to forward specimens to another testing laboratory, storing of additional serum samples is recommended for IgM antibody testing in the event of an rRT-PCR negative result.

\*\* Possible exposure to Zika virus includes travel to or residence in an area with active Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices/>), or sex (vaginal sex (penis-to-vagina sex), anal sex (penis-to-anus sex), oral sex (mouth-to-penis sex or mouth-to-vagina sex), and the sharing of sex toys) without a barrier method to prevent infection (male or female condoms for vaginal or anal sex, male condoms for oral sex (mouth-to-penis), and male condoms cut to create a flat barrier or dental dams for oral sex (mouth-to-vagina) with a partner who traveled to, or lives in an area with active Zika virus transmission).

maternal Zika virus infection. However, if the rRT-PCR result is negative, a positive or equivocal Zika virus IgM antibody test result should be followed by PRNT. Positive or equivocal dengue IgM antibody test results with a negative Zika virus IgM antibody test result should also be confirmed by PRNT. Interpretation of serologic results has been described (8).

**Asymptomatic pregnant women.** Testing recommendations for asymptomatic pregnant women with possible Zika virus exposure differ based on the circumstances of possible exposure (i.e., ongoing versus limited exposure) and the elapsed interval since the last possible Zika virus exposure (Figure). Asymptomatic pregnant women living in areas without active Zika virus transmission who are evaluated <2 weeks after possible Zika virus exposure should be offered serum and urine rRT-PCR testing (Figure). A positive rRT-PCR result confirms the diagnosis of recent maternal Zika virus infection. However, because viral RNA in serum and urine declines over time and depends on multiple factors, asymptomatic pregnant women with a negative rRT-PCR result require additional testing to exclude infection. These women should return 2–12 weeks after possible Zika virus exposure for Zika virus IgM antibody testing. A positive or equivocal IgM antibody test result should be confirmed by PRNT.

Asymptomatic pregnant women living in an area without active Zika virus transmission, who seek care 2–12 weeks after possible Zika virus exposure, should be offered Zika virus IgM antibody testing (Figure). If the Zika virus IgM antibody test yields positive or equivocal results, reflex rRT-PCR testing should be performed on the same sample. If the rRT-PCR result is negative, PRNT should be performed.

As recommended in previous guidance (9,13), IgM antibody testing is recommended as part of routine obstetric care during the first and second trimesters for asymptomatic pregnant women who have an ongoing risk for Zika virus exposure (i.e., residence in or frequent travel to an area with active Zika virus transmission) (Figure). Reflex rRT-PCR testing is recommended for women who have a positive or equivocal Zika virus IgM antibody test results because rRT-PCR testing provides the potential for a definitive diagnosis of Zika virus infection. Negative rRT-PCR results after a positive or equivocal Zika virus IgM antibody test result should be followed by PRNT. The decision to implement testing of asymptomatic pregnant women with ongoing risk for Zika virus exposure should be made by local health officials based on information about levels of Zika virus transmission and laboratory capacity.

**Symptomatic and asymptomatic pregnant women who seek care >12 weeks after symptom onset or possible Zika virus exposure.** For symptomatic and asymptomatic pregnant women with possible Zika virus exposure who seek care >12 weeks after symptom onset or possible exposure, IgM

antibody testing might be considered. If fetal abnormalities are present, rRT-PCR testing should also be performed on maternal serum and urine. However, a negative IgM antibody test or rRT-PCR result >12 weeks after symptom onset or possible exposure does not rule out recent Zika virus infection because IgM antibody and viral RNA levels decline over time. Given the limitations of testing beyond 12 weeks after symptom onset or possible exposure, serial fetal ultrasounds should be considered.

### Updated Recommendations for Prenatal Management of Pregnant Women with Laboratory Evidence of Confirmed or Possible Zika Virus Infection

Laboratory evidence of a confirmed recent Zika virus infection includes 1) detection of Zika virus or Zika virus RNA or antigen in any body fluid or tissue specimen or 2) positive or equivocal Zika virus or dengue virus IgM antibody test results on serum or cerebrospinal fluid with a positive ( $\geq 10$ ) PRNT titer for Zika virus together with a negative ( $< 10$ ) PRNT titer for dengue virus (8). However, given that serology test results can be difficult to interpret, particularly in persons who were previously infected with or vaccinated against flaviviruses, and because the adverse outcomes caused by Zika virus infection during pregnancy are not fully described, pregnant women with laboratory evidence of recent flavivirus infection are considered to have possible Zika virus infection and should be monitored frequently (Table).

Pregnant women with confirmed or possible Zika virus infection should be managed in accordance with the updated CDC Interim Guidance (Table). In addition, pregnant women with presumptive recent Zika virus or flavivirus infection (i.e., positive or equivocal Zika virus or dengue virus IgM antibody test result that needs to be confirmed by PRNT) should also be managed in accordance with this updated guidance (Table) until final results are available. Serial fetal ultrasounds (every 3–4 weeks) should be considered to assess fetal anatomy, particularly neuroanatomy, and to monitor growth. Ultrasound findings that have been associated with congenital Zika virus syndrome include microcephaly, intracranial calcifications, ventriculomegaly, arthrogryposis, and abnormalities of the corpus callosum, cerebrum, cerebellum, and eyes (1,14). Consideration of amniocentesis should be individualized, because data about its usefulness in diagnosing congenital Zika virus infection are limited (13). The presence of Zika virus RNA in the amniotic fluid might indicate fetal infection (5,15); however, a negative result does not exclude congenital Zika virus infection (13). In addition, persistent detection of Zika virus RNA in serum has been reported during pregnancy (7).

**TABLE. Clinical management of a pregnant woman with suspected Zika virus infection**

Interpretation of laboratory results*	Prenatal management	Postnatal management
Recent Zika virus infection	Consider serial ultrasounds every 3–4 weeks to assess fetal anatomy and growth. <sup>†</sup> Decisions regarding amniocentesis should be individualized for each clinical circumstance. <sup>§</sup>	<i>Live births:</i> Cord blood and infant serum should be tested for Zika virus by rRT-PCR, and for Zika IgM and dengue virus IgM antibodies. If CSF is obtained for other reasons, it can also be tested. Zika virus rRT-PCR and IHC staining of umbilical cord and placenta are recommended. <sup>¶</sup> <i>Fetal losses:</i> Zika virus rRT-PCR and IHC staining of fetal tissues is recommended. <sup>¶</sup>
Recent flavivirus infection; specific virus cannot be identified		
Presumptive recent Zika virus infection**	Consider serial ultrasounds every 3–4 weeks to assess fetal anatomy and growth. <sup>†</sup> Amniocentesis might be considered; decisions should be individualized for each clinical circumstance.	<i>Live births:</i> Cord blood and infant serum should be tested for Zika virus by rRT-PCR, and for Zika virus IgM and dengue virus IgM antibodies. If CSF is obtained for other reasons, it can also be tested. Zika virus rRT-PCR and IHC staining of umbilical cord and placenta should be considered. <sup>¶</sup> <i>Fetal losses:</i> Zika virus rRT-PCR and IHC staining of fetal tissues should be considered. <sup>¶</sup>
Presumptive recent flavivirus infection**		
Recent dengue virus infection	Clinical management in accordance with existing guidelines. <sup>††</sup>	
No evidence of Zika virus or dengue virus infection	Prenatal ultrasound to evaluate for fetal abnormalities consistent with congenital Zika virus syndrome. <sup>†</sup> <i>Fetal abnormalities present:</i> repeat Zika virus rRT-PCR and IgM test; base clinical management on corresponding laboratory results. <i>Fetal abnormalities absent:</i> base obstetric care on the ongoing risk for Zika virus exposure risk to the pregnant woman.	

**Abbreviations:** CSF = cerebrospinal fluid; IgM = immunoglobulin M; IHC = immunohistochemical; PRNT = plaque reduction neutralization test; rRT-PCR = real-time reverse transcription–polymerase chain reaction.

\* Refer to the previously published guidance for testing interpretation (<http://www.cdc.gov/mmwr/volumes/65/wr/mm6521e1.htm>).

<sup>†</sup> Fetal abnormalities consistent with congenital Zika virus syndrome include microcephaly, intracranial calcifications, and brain and eye abnormalities.

<sup>§</sup> Health care providers should discuss risks and benefits of amniocentesis with their patients. It is not known how sensitive or specific rRT-PCR testing of amniotic fluid is for congenital Zika virus infection, whether a positive result is predictive of a subsequent fetal abnormality, and if it is predictive, what proportion of infants born after infection will have abnormalities.

<sup>¶</sup> Refer to pathology guidance for collection and submission of fetal tissues for Zika virus testing for detailed information on recommended specimen types (<http://www.cdc.gov/zika/laboratories/test-specimens-tissues.html>).

\*\* rRT-PCR or PRNT should be performed for positive or equivocal IgM results as indicated. PRNT results that indicate recent flavivirus infection should be interpreted in the context of the currently circulating flaviviruses. Refer to the laboratory guidance for updated testing recommendations (<http://www.cdc.gov/zika/laboratories/lab-guidance.html>). Because of the overlap of symptoms and areas where other viral illnesses are endemic, evaluate for possible dengue or chikungunya virus infection.

<sup>††</sup> [http://apps.who.int/iris/bitstream/10665/44188/1/9789241547871\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44188/1/9789241547871_eng.pdf).

The clinical implications of prolonged detection of Zika virus RNA in serum are not known; however, repeat rRT-PCR testing has been performed in some cases (5,7).

### Updated Recommendations for Postnatal Management of Pregnant Women with Laboratory Evidence of Confirmed or Possible Zika Virus Infection

Infants born to women with laboratory evidence of confirmed or possible Zika virus infection should be evaluated for congenital Zika virus infection in accordance with CDC interim guidance for health care providers caring for infants with possible Zika virus infection. (16). Zika virus testing is recommended for these infants regardless of the presence or absence of phenotypic abnormalities (14). Previous published guidance recommended that testing be performed on cord blood or infant serum; however, the use of cord blood to diagnose other congenital viral infections, such as HIV and syphilis, has sometimes yielded inaccurate results (17–20). Maternal blood can contaminate cord blood specimens leading to false-positive results, whereas Wharton's jelly in the umbilical cord can yield false-negative results (19,20). Cord blood samples can also become clotted, which does not allow for appropriate

serologic testing. Therefore, although collection and testing of cord blood for Zika virus testing can be performed, these results should be interpreted in conjunction with infant serum results. Pathology evaluation of fetal tissue specimens (e.g., placenta and umbilical cord)\*\*\* is another important diagnostic tool to establish the presence of maternal Zika virus infection and can provide a definitive diagnosis for pregnant women with Zika virus infection whose serology results indicate recent unspecified flavivirus infection. In addition, pathology findings might also be helpful in evaluating pregnant women who seek care >12 weeks after symptom onset or possible exposure; Zika virus RNA has been reported to persist in tissue specimens including placenta and fetal brain (21). A positive rRT-PCR or immunohistochemical staining on the placenta indicates the presence of maternal infection (21).

Pregnant women with laboratory evidence of confirmed or possible Zika virus infection who experience a fetal loss or stillbirth should be offered pathology testing for Zika virus infection; testing includes rRT-PCR and immunohistochemical staining of fixed tissue (21). This testing might provide insight into the etiology of the fetal loss, which could inform a woman's future pregnancy planning. Additional information is available at <http://www.cdc.gov/zika>.

\*\*\* <http://www.cdc.gov/zika/laboratories/test-specimens-tissues.html>.

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## References

- Rasmussen SA, Jamieson DJ, Honein MA, Petersen LR. Zika virus and birth defects—reviewing the evidence for causality. *N Engl J Med* 2016;374:1981–7. <http://dx.doi.org/10.1056/NEJMSr1604338>
- Meaney-Delman D, Rasmussen SA, Staples JE, et al. Zika virus and pregnancy: what obstetric health care providers need to know. *Obstet Gynecol* 2016;127:642–8. <http://dx.doi.org/10.1097/AOG.0000000000001378>
- Simeone RM, Shapiro-Mendoza CK, Meaney-Delman D, et al.; Zika and Pregnancy Working Group. Possible Zika virus infection among pregnant women—United States and Territories, May 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:514–9. <http://dx.doi.org/10.15585/mmwr.mm6520e1>
- Bocanegra C, Sulleiro E, Soriano-Arandes A, et al. Zika virus infection in pregnant women in Barcelona, Spain. *Clin Microbiol Infect*. In press 2016.
- Driggers RW, Ho CY, Korhonen EM, et al. Zika virus infection with prolonged maternal viremia and fetal brain abnormalities. *N Engl J Med* 2016;374:2142–51. <http://dx.doi.org/10.1056/NEJMoa1601824>
- Pacheco O, Beltrán M, Nelson CA, et al. Zika virus disease in Colombia—preliminary report. *N Engl J Med* 2016;NEJMoa1604037. <http://dx.doi.org/10.1056/NEJMoa1604037>
- Meaney-Delman D, Oduyebo T, Polen KND, et al. Prolonged detection of Zika virus RNA in pregnant women. *Obstet Gynecol* In press 2016.
- Rabe IB, Staples JE, Villanueva J, et al. Interim guidance for interpretation of Zika virus antibody test results. *MMWR Morb Mortal Wkly Rep* 2016;65:543–6. <http://dx.doi.org/10.15585/mmwr.mm6521e1>
- Oduyebo T, Petersen EE, Rasmussen SA, et al. Update: interim guidelines for health care providers caring for pregnant women and women of reproductive age with possible Zika virus exposure—United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:122–7. <http://dx.doi.org/10.15585/mmwr.mm6505e2>
- Petersen EE, Staples JE, Meaney-Delman D, et al. Interim guidelines for pregnant women during a Zika virus outbreak—United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:30–3. <http://dx.doi.org/10.15585/mmwr.mm6502e1>
- Oster AM, Russell K, Stryker JE, et al. Update: interim guidance for prevention of sexual transmission of Zika virus—United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:323–5. <http://dx.doi.org/10.15585/mmwr.mm6512e3>
- CDC. CDC Recommendations for subsequent Zika IgM antibody testing. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <http://emergency.cdc.gov/han/han00392.asp>
- Petersen EE, Polen KN, Meaney-Delman D, et al. Update: interim guidance for health care providers caring for women of reproductive age with possible Zika virus exposure—United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:315–22. <http://dx.doi.org/10.15585/mmwr.mm6512e2>
- Franca GV, Schuler-Faccini L, Oliveira WK, et al. Congenital Zika virus syndrome in Brazil: a case series of the first 1501 livebirths with complete investigation. *Lancet* 2016. Epub June 29, 2016. [http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(16\)30902-3.pdf](http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)30902-3.pdf)
- Meaney-Delman D, Hills SL, Williams C, et al. Zika Virus infection among U.S. pregnant travelers—August 2015–February 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:211–4. <http://dx.doi.org/10.15585/mmwr.mm6508e1>
- Fleming-Dutra KE, Nelson JM, Fischer M, et al. Update: interim guidelines for health care providers caring for infants and children with possible Zika virus infection—United States, February 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:182–7. <http://dx.doi.org/10.15585/mmwr.mm6507e1>
- Lo YM, Lo ES, Watson N, et al. Two-way cell traffic between mother and fetus: biologic and clinical implications. *Blood* 1996;88:4390–5.
- Masuzaki H, Miura K, Miura S, et al. Labor increases maternal DNA contamination in cord blood. *Clin Chem* 2004;50:1709–11. <http://dx.doi.org/10.1373/clinchem.2004.036517>
- Chhabra RS, Brion LP, Castro M, Freundlich L, Glaser JH. Comparison of maternal sera, cord blood, and neonatal sera for detecting presumptive congenital syphilis: relationship with maternal treatment. *Pediatrics* 1993;91:88–91.
- Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm Rep* 2015;64(RR-03).
- Martines RB, Bhatnagar J, de Oliveira Ramos AM, et al. Pathology of congenital Zika syndrome in Brazil: a case series. *Lancet* 2016. Epub June 29, 2016. [http://thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(16\)30883-2.pdf](http://thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)30883-2.pdf)

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## Update: Interim Guidance for Preconception Counseling and Prevention of Sexual Transmission of Zika Virus for Persons with Possible Zika Virus Exposure — United States, September 2016

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On September 30, 2016, this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).

CDC has updated its interim guidance for persons with possible Zika virus exposure who are planning to conceive (1) and interim guidance to prevent transmission of Zika virus through sexual contact (2), now combined into a single document. Guidance for care for pregnant women with possible Zika virus exposure was previously published (3). Possible Zika virus exposure is defined as travel to or residence in an area of active Zika virus transmission (<http://www.cdc.gov/zika/geo/index.html>), or sex\* without a condom† with a partner who traveled to or lived in an area of active transmission. Based on new though limited data, CDC now recommends that all men with possible Zika virus exposure who are considering attempting conception with their partner, regardless of symptom status,§ wait to conceive until at least 6 months after symptom onset (if symptomatic) or last possible Zika virus exposure (if asymptomatic). Recommendations for women planning to conceive remain unchanged: women with possible Zika virus exposure are recommended to wait to conceive until at least 8 weeks after symptom onset (if symptomatic) or last possible Zika virus exposure (if asymptomatic). Couples with possible Zika virus exposure, who are not pregnant and do not plan to become pregnant, who want to minimize their risk for sexual transmission of Zika virus should use a condom or abstain from sex for the same periods for men and women described above. Women of reproductive age who have had or anticipate future Zika virus exposure who do not want to become pregnant should use the most effective contraceptive method that can be used correctly and consistently. These recommendations will be further updated when additional data become available.

\* For the purpose of this guidance, sex is specifically defined as vaginal sex (penis-to-vagina sex), anal sex (penis-to-anus sex), oral sex (mouth-to-penis sex or mouth-to-vagina sex), and the sharing of sex toys.

† Condoms include the use of male or female condoms for vaginal or anal sex, male condoms for oral sex (mouth-to-penis), and male condoms cut to create a flat barrier or dental dams for oral sex (mouth-to-vagina).

§ A person is considered symptomatic if one or more signs or symptoms (acute onset of fever, rash, arthralgia, or conjunctivitis) consistent with Zika virus disease is reported. A person is considered asymptomatic if these symptoms are not reported.

### Review of Evidence

Zika virus infection during pregnancy is a cause of congenital microcephaly and serious brain abnormalities (4). The risk for adverse pregnancy outcomes associated with maternal Zika virus infection around the time of conception is unknown. To date, there have been no published reports of adverse pregnancy outcomes after periconceptual Zika virus infection. Infections with other viruses (e.g., cytomegalovirus, rubella, parvovirus) around the time of conception have been associated with congenital infection and adverse pregnancy outcomes, although the exact timing of infection relative to conception was sometimes uncertain (5–9).

Zika virus is transmitted primarily through the bite of *Aedes aegypti* mosquitoes. Zika virus can also be transmitted through sex without a condom. The risk for sexual transmission of Zika virus from a person infected with Zika virus remains unknown. Most reported sexual transmissions have been from persons with symptomatic Zika virus infections, including from men to female sex partners (10–12), from a man to his male sex partner (13), and from a woman to her male sex partner (14). Two new reports describe one presumed and one more definitive case of sexual transmission from men with asymptomatic Zika virus infection to female sex partners (15,16). Sexual transmission of Zika virus has been associated with condomless anal sex and vaginal sex and possibly also with fellatio (17). Among reported cases of sexually transmitted Zika virus infection, the longest reported period between sexual contact that might have transmitted Zika virus and symptom onset was 32–41 days (based on an incubation period of 3–12 days) (18).

Data on the detection of Zika virus RNA in semen can inform estimates of the periods during which sexual transmission might occur. However, detection of Zika virus RNA in semen might not indicate the presence of infectious virus and thus the potential for sexual transmission. Reports indicate that concentrations of detectable Zika virus RNA in semen decrease after infection (17,19–28). Zika virus RNA was detected in semen of five men more than 90 days after symptom onset,

with the longest period of reported detection 188 days after symptom onset (20,26,29,30). Culture is considered the gold standard for demonstrating the presence of replicative and thus infectious virus, and among four published reports of Zika virus cultured from semen, virus was reported in semen up to 69 days after symptom onset (17,19,21,31). Culture methods varied in these studies and additional studies are needed to confirm the presence of infectious virus in semen.

New data on the persistence of Zika virus RNA in serum and whole blood might have implications, both for sexual transmission of Zika virus and for fetal exposure to Zika virus. Zika virus RNA has been detected in the serum of nonpregnant persons up to 11–13 days after symptom onset (32); in the serum of pregnant women, Zika virus RNA has been detected up to 10 weeks after symptom onset (33,34). Zika virus RNA was detected in whole blood of a nonpregnant person up to 58 days after symptom onset followed by a negative result at 79 days; however, Zika virus could not be cultured at 58 days (35). Experience with other flaviviruses suggests that if a person's immune system has activated an antibody response, viral transmission (i.e., through blood transfusion) is unlikely (36). Detection of Zika virus RNA in blood might not indicate the presence of infectious virus, and thus the potential risk for maternal-fetal Zika virus transmission periconceptionally is unknown.

### Guidance for Preconception Counseling and Prevention of Sexual Transmission

CDC is updating its guidance on timing of conception after possible Zika virus exposure and prevention of sexual transmission of Zika virus. CDC continues to evaluate all available evidence and update recommendations as new data become available. Most of the recommendations for preconception counseling and prevention of sexual transmission are dependent on whether persons live in or travel to areas of active Zika virus transmission.<sup>¶</sup> As of September 26, 2016, 59 countries and U.S. territories reported active Zika virus transmission. The Florida Department of Health identified two areas of Miami-Dade County with active local mosquito-borne Zika virus transmission; as of September 20, 2016, only one remains an area of active transmission (37). Updates on areas with active Zika virus transmission are available online at <http://www.cdc.gov/zika/geo/index.html>.

**For Couples Planning to Conceive Who Do Not Live in Areas with Active Zika Virus Transmission.** Health care providers should discuss couples' travel plans in preconception counseling. Women and men who are planning to conceive in

the near future should consider avoiding nonessential travel to areas with active Zika virus transmission.

Women who have had possible Zika virus exposure through travel or sexual contact and do not have ongoing risks for exposure should wait at least 8 weeks from symptom onset (if symptomatic) or last possible exposure (if asymptomatic) to attempt conception. Women who wait at least 8 weeks to conceive might have an increased likelihood that Zika virus no longer presents a risk for maternal-fetal transmission.

CDC now recommends that men with possible Zika virus exposure, regardless of symptom status, wait at least 6 months from symptom onset (if symptomatic) or last possible exposure (if asymptomatic) before attempting conception with their partner. CDC previously recommended that men with possible Zika virus exposure who were asymptomatic wait at least 8 weeks from last possible exposure. The updated recommendation minimizes the likelihood that periconceptional sexual transmission will result in fetal exposure to Zika virus. The recommendation to wait at least 6 months for asymptomatic men is based on the range of time after symptom onset that Zika virus RNA has been detected in semen of symptomatic men and the absence of definitive data that the risk for sexual transmission differs between symptomatic and asymptomatic men. Zika virus has not been definitively cultured from semen more than 3 months after symptom onset. It is unknown whether detection of Zika virus RNA in semen indicates presence of infectious virus and the potential for transmission. Current recommendations provide couples planning to conceive with periods that, based on existing data, are expected to minimize risk for Zika virus transmission to an uninfected partner. Studies are underway to better understand the persistence of infectious Zika virus in semen and the associated risk for sexual transmission of the virus. Given that limited data are available, some couples in whom a partner had possible Zika virus exposure might choose to wait longer or shorter than the recommended period to conceive, depending on individual circumstances (e.g., age, fertility, details of possible exposure) and risk tolerance. For example, after consultation with their health care provider, symptomatic persons with negative test results who received testing in the appropriate time window and in accordance with the testing algorithm (38) might choose not to wait to conceive.

**For Couples Who Want to Conceive, in Which One or Both Partners Live in Areas with Active Zika Virus Transmission.** Women and men who reside in areas with active Zika virus transmission and who experience symptoms of Zika virus disease should be tested for Zika virus infection (38). Men with results that indicate recent Zika virus or unspecified flavivirus infection should wait at least 6 months from symptom

<sup>¶</sup><http://www.cdc.gov/zika/geo/index.html>.

onset to attempt conception with their partner; women with results that indicate recent Zika virus or unspecified flavivirus infection should wait at least 8 weeks from symptom onset to attempt conception. Persons who have had symptoms of Zika virus disease with negative Zika virus test results should talk with their health care provider about timing of conception in the setting of ongoing risk for possible exposure.

Persons living in an area with active Zika virus transmission should be counseled on the possible risk for Zika virus infection during the periconception period. CDC has developed tools to assist health care providers with preconception counseling (39). Health care providers should provide counseling about the potential consequences to the fetus associated with Zika virus infection during pregnancy, such as microcephaly and other serious brain abnormalities. Women and men should discuss their reproductive life plans\*\* with their health care provider, in the context of potential and ongoing Zika virus exposure. Health care providers should review factors that might influence pregnancy timing (e.g., unknown duration of Zika virus outbreak, fertility, age, reproductive history, medical history, personal values and preferences). For couples who choose to conceive, health care providers should stress use of mosquito bite prevention strategies†† while attempting pregnancy and during pregnancy. Health care providers should counsel couples who decide to wait to attempt conception about strategies to prevent unintended pregnancy, including the most effective contraceptive methods (i.e., long-acting reversible contraception) and provide contraception or referral to appropriate providers for contraception care (40).

**Special Considerations for Women Undergoing Fertility Treatment.** Zika virus transmission through assisted reproductive technology has not been reported. However, transmission through gametes or embryos is theoretically possible. Recommendations for sexually intimate couples with Zika virus infection or possible Zika virus exposure undergoing fertility treatment with their own gametes and embryos should follow the testing and timing recommendations as described above; recommendations might need to be adjusted depending on individual circumstances and risk tolerance. The Food and Drug Administration has issued guidance to reduce the risk for Zika virus transmission by donated human cells, tissues, and cellular and tissue-based products, including reproductive tissues (41).

**For Couples Who Are Not Pregnant and Are Not Planning to Become Pregnant in the Near Future.** Couples in whom the man or woman has had possible Zika virus exposure who want to maximally reduce their risk for sexually transmitting

Zika virus to the uninfected partner should use condoms consistently and correctly or abstain from sex for at least 6 months for men or 8 weeks for women after symptom onset (if symptomatic) or last possible Zika virus exposure (if asymptomatic). Some couples might choose to use condoms or abstain from sex for a shorter or longer period than recommended depending on individual circumstances. Couples should be advised that correct and consistent use of condoms reduces the risk for other sexually transmitted infections.

Health care providers should discuss strategies to prevent unintended pregnancy with couples who do not want to become pregnant. Safety, effectiveness, availability, and acceptability should be considered when choosing a contraceptive method (42). Patients should be counseled to use the most effective contraceptive method that can be used correctly and consistently. Long-acting reversible contraception, including contraceptive implants and intrauterine devices, provide highly effective reversible options.

**For Pregnant Women and Their Partners.** Pregnant women living in areas without active Zika virus transmission should be advised to avoid nonessential travel to areas with active transmission. Persons who have traveled to or live in an area with active Zika virus transmission and whose partner is pregnant should be advised to consistently and correctly use condoms during sex or abstain from sex for the duration of the pregnancy. These actions reduce the risk for sexual transmission of Zika virus during pregnancy. Health care providers should ask pregnant women about their own and their sex partner's history of travel to areas with active Zika virus transmission. Pregnant women with possible Zika virus exposure, either through sex or through traveling to or living in an area with active Zika virus transmission, should be tested for Zika virus infection in accordance with CDC's "Updated Interim Pregnancy Guidance: Testing and Interpretation Recommendations for a Pregnant Women with Possible Exposure to Zika Virus" ([http://www.cdc.gov/zika/pdfs/testing\\_algorithm.pdf](http://www.cdc.gov/zika/pdfs/testing_algorithm.pdf)), including pregnant women with possible sexual exposure whose sex partner has had no symptoms of Zika virus disease. Further guidance for care of pregnant women with possible Zika virus exposure has been published (3).

### Zika Virus Testing

Persons with possible Zika virus exposure who have symptoms of Zika virus disease should receive testing in accordance with CDC interim guidance: "Algorithm for U.S. Testing of Symptomatic Individuals" (38). CDC does not recommend Zika virus testing of nonpregnant persons with possible Zika virus exposure who do not have symptoms of Zika virus disease, including persons who are planning to attempt conception, or to assess the risk for sexual transmission of Zika virus. Zika virus testing for this purpose remains of uncertain value, because

\*\* <http://www.cdc.gov/preconception/reproductiveplan.html>.

†† <https://www.cdc.gov/zika/prevention/prevent-mosquito-bites.html>.

current understanding of the duration and pattern of shedding of Zika virus in reproductive tissues is limited. Information on the performance of serologic Zika virus testing remains limited, with falsely positive tests resulting in avoidable stress and expense and falsely negative tests providing false reassurance and possibly leading to inadvertent fetal exposure to Zika virus.

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## References

- Petersen EE, Polen KN, Meaney-Delman D, et al. Update: interim guidance for health care providers caring for women of reproductive age with possible Zika virus exposure—United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:315–22. <http://dx.doi.org/10.15585/mmwr.mm6512e2>
- Brooks JT, Friedman A, Kachur RE, LaFlam M, Peters PJ, Jamieson DJ. Update: interim guidance for prevention of sexual transmission of Zika virus—United States, July 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:745–7. <http://dx.doi.org/10.15585/mmwr.mm6529e2>
- Oduyebo T, Igbinoza I, Petersen EE, et al. Update: interim guidance for health care providers caring for pregnant women with possible Zika virus exposure—United States, July 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:739–44. <http://dx.doi.org/10.15585/mmwr.mm6529e1>
- Rasmussen SA, Jamieson DJ, Honein MA, Petersen LR. Zika virus and birth defects—reviewing the evidence for causality. *N Engl J Med* 2016;374:1981–7. <http://dx.doi.org/10.1056/NEJMSr1604338>
- Daiminger A, Bäder U, Enders G. Pre- and periconceptional primary cytomegalovirus infection: risk of vertical transmission and congenital disease. *BJOG* 2005;112:166–72. <http://dx.doi.org/10.1111/j.1471-0528.2004.00328.x>
- Enders G, Miller E, Nickerl-Pacher U, Cradock-Watson JE. Outcome of confirmed periconceptional maternal rubella. *Lancet* 1988;331:1445–7. [http://dx.doi.org/10.1016/S0140-6736\(88\)92249-0](http://dx.doi.org/10.1016/S0140-6736(88)92249-0)
- Picone O, Vauloup-Fellous C, Cordier AG, et al. A series of 238 cytomegalovirus primary infections during pregnancy: description and outcome. *Prenat Diagn* 2013;33:751–8. <http://dx.doi.org/10.1002/pd.4118>
- Revello MG, Zavattoni M, Furione M, Lilleri D, Gorini G, Gerna G. Diagnosis and outcome of preconceptional and periconceptional primary human cytomegalovirus infections. *J Infect Dis* 2002;186:553–7. <http://dx.doi.org/10.1086/341831>
- Nunoue T, Kusuhara K, Hara T. Human fetal infection with parvovirus B19: maternal infection time in gestation, viral persistence and fetal prognosis. *Pediatr Infect Dis J* 2002;21:1133–6. <http://dx.doi.org/10.1097/00006454-200212000-00009>
- Foy BD, Kobylinski KC, Chilson Foy JL, et al. Probable non-vector-borne transmission of Zika virus, Colorado, USA. *Emerg Infect Dis* 2011;17:880–2. <http://dx.doi.org/10.3201/eid1705.101939>
- Hills SL, Russell K, Hennessey M, et al. Transmission of Zika virus through sexual contact with travelers to areas of ongoing transmission—Continental United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:215–6. <http://dx.doi.org/10.15585/mmwr.mm6508e2>
- Venturi G, Zammarchi L, Fortuna C, et al. An autochthonous case of Zika due to possible sexual transmission, Florence, Italy, 2014. *Euro Surveill* 2016;21:30148. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.8.30148>
- Deckard DT, Chung WM, Brooks JT, et al. Male-to-male sexual transmission of Zika virus—Texas, January 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:372–4. <http://dx.doi.org/10.15585/mmwr.mm6514a3>
- Davidson A, Slavinski S, Komoto K, Rakeman J, Weiss D. Suspected female-to-male sexual transmission of Zika virus—New York City, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:716–7. <http://dx.doi.org/10.15585/mmwr.mm6528e2>
- Fréour T, Mirallié S, Hubert B, et al. Sexual transmission of Zika virus in an entirely asymptomatic couple returning from a Zika epidemic area, France, April 2016. *Euro Surveill* 2016;21:30254. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.23.30254>
- Brooks RB, Carlos MP, Myers RA, et al. Likely sexual transmission of Zika virus from a man with no symptoms of infection—Maryland, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:915–6. <http://dx.doi.org/10.15585/mmwr.mm6534e2>
- D'Ortenzio E, Matheron S, de Lamballerie X, et al. Evidence of sexual transmission of Zika virus. *N Engl J Med* 2016;374:2195–8. <http://dx.doi.org/10.1056/NEJMc1604449>
- Turmel JM, Abgueguen P, Hubert B, et al. Late sexual transmission of Zika virus related to persistence in the semen. *Lancet* 2016;387:2501. [http://dx.doi.org/10.1016/S0140-6736\(16\)30775-9](http://dx.doi.org/10.1016/S0140-6736(16)30775-9)
- Musso D, Roche C, Robin E, Nhan T, Teissier A, Cao-Lormeau VM. Potential sexual transmission of Zika virus. *Emerg Infect Dis* 2015;21:359–61. <http://dx.doi.org/10.3201/eid2102.141363>
- Mansuy JM, Suberbielle E, Chapuy-Regaud S, et al. Zika virus in semen and spermatozoa. *Lancet Infect Dis* 2016;16:1106–7. [http://dx.doi.org/10.1016/S1473-3099\(16\)30336-X](http://dx.doi.org/10.1016/S1473-3099(16)30336-X)
- Mansuy JM, Dutertré M, Mengelle C, et al. Zika virus: high infectious viral load in semen, a new sexually transmitted pathogen? *Lancet Infect Dis* 2016;16:405. [http://dx.doi.org/10.1016/S1473-3099\(16\)00138-9](http://dx.doi.org/10.1016/S1473-3099(16)00138-9)
- Atkinson B, Hearn P, Afrough B, et al. Detection of Zika virus in semen. *Emerg Infect Dis* 2016;22:940. <http://dx.doi.org/10.3201/eid2205.160107>
- Reusken C, Pas S, GeurtsvanKessel C, et al. Longitudinal follow-up of Zika virus RNA in semen of a traveller returning from Barbados to the Netherlands with Zika virus disease, March 2016. *Euro Surveill* 2016;21:30251. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.23.30251>
- Matheron S, d'Ortenzio E, Leparç-Goffart I, Hubert B, de Lamballerie X, Yazdanpanah Y. Long-lasting persistence of Zika virus in semen. *Clin Infect Dis* 2016. E-pub July 28, 2016. <http://dx.doi.org/10.1093/cid/ciw509>
- Harrower J, Kiedrzyński T, Baker S, et al. Sexual transmission of Zika virus and persistence in semen, New Zealand, 2016. *Emerg Infect Dis* 2016;22:1855–7. <http://dx.doi.org/10.3201/eid2210.160951>
- Mansuy JM, Pasquier C, Daudin M, et al. Zika virus in semen of a patient returning from a non-epidemic area. *Lancet Infect Dis* 2016;16:894–5. [http://dx.doi.org/10.1016/S1473-3099\(16\)30153-0](http://dx.doi.org/10.1016/S1473-3099(16)30153-0)
- Frank C, Cadar D, Schlaphof A, et al. Sexual transmission of Zika virus in Germany, April 2016. *Euro Surveill* 2016;21:30252. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.23.30252>
- Huits B, Arien KK, Van Esbroeck M, de Jong BC, Bottieau E, Cnops L. Kinetics of Zika virus persistence in semen. *Bull World Health Organ* 2016. E-pub July 6, 2016. [http://www.who.int/bulletin/online\\_first/16-181370.pdf](http://www.who.int/bulletin/online_first/16-181370.pdf)
- Barzon L, Pacenti M, Franchin E, et al. Infection dynamics in a traveller with persistent shedding of Zika virus RNA in semen for six months after returning from Haiti to Italy, January 2016. *Euro Surveill* 2016;21:30316. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.32.30316>
- Nicastri E, Castilletti C, Liuzzi G, Iannetta M, Capobianchi MR, Ippolito G. Persistent detection of Zika virus RNA in semen for six months after symptom onset in a traveller returning from Haiti to Italy, February 2016. *Euro Surveill* 2016;21:30314. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.32.30314>
- Arzuaga M, Bujalance SG, Díaz-Menéndez M, Vázquez A, Arribas JR. Probable sexual transmission of Zika virus from a vasectomised man. *Lancet Infect Dis* 2016;16:1107. [http://dx.doi.org/10.1016/S1473-3099\(16\)30320-6](http://dx.doi.org/10.1016/S1473-3099(16)30320-6)

32. Lanciotti RS, Kosoy OL, Laven JJ, et al. Genetic and serologic properties of Zika virus associated with an epidemic, Yap State, Micronesia, 2007. *Emerg Infect Dis* 2008;14:1232–9. <http://dx.doi.org/10.3201/eid1408.080287>
33. Driggers RW, Ho CY, Korhonen EM, et al. Zika virus infection with prolonged maternal viremia and fetal brain abnormalities. *N Engl J Med* 2016;374:2142–51. <http://dx.doi.org/10.1056/NEJMoa1601824>
34. Meaney-Delman D, Oduyebo T, Polen KN, et al.; U.S. Zika Pregnancy Registry Prolonged Viremia Working Group. Prolonged detection of Zika virus RNA in pregnant women. *Obstet Gynecol* 2016;128:724–30. <http://dx.doi.org/10.1097/AOG.0000000000001625>
35. Lustig Y, Mendelson E, Paran N, Melamed S, Schwartz E. Detection of Zika virus RNA in whole blood of imported Zika virus disease cases up to 2 months after symptom onset, Israel, December 2015 to April 2016. *Euro Surveill* 2016;21:30269. <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.26.30269>
36. Busch MP, Kleinman SH, Tobler LH, et al. Virus and antibody dynamics in acute West Nile virus infection. *J Infect Dis* 2008;198:984–93. <http://dx.doi.org/10.1086/591467>
37. CDC. CDC updates guidance for travel and testing of pregnant women and women of reproductive age for Zika virus infection related to the ongoing investigation of local mosquito-borne Zika virus transmission in Miami-Dade County, Florida. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <https://emergency.cdc.gov/han/han00396.asp>
38. CDC. Guidance for U.S. laboratories testing for Zika virus infection. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <http://www.cdc.gov/zika/laboratories/lab-guidance.html>
39. CDC. Preconception counseling for women and men living in areas with ongoing spread of Zika virus who are interested in conceiving. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <https://www.cdc.gov/zika/pdfs/preconception-counseling.pdf>
40. CDC. Effectiveness of family planning methods. Atlanta, GA: US Department of Health and Human Services, CDC; 2016. [https://www.cdc.gov/reproductivehealth/unintendedpregnancy/pdf/contraceptive\\_methods\\_508.pdf](https://www.cdc.gov/reproductivehealth/unintendedpregnancy/pdf/contraceptive_methods_508.pdf)
41. Food and Drug Administration. Donor screening recommendations to reduce the risk of transmission of Zika virus by human cells, tissues, and cellular and tissue-based products. Silver Spring, MD: US Department of Health and Human Services, Food and Drug Administration; 2016. <http://www.fda.gov/downloads/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/Guidances/Tissue/UCM488582.pdf>
42. Curtis KM, Jatlaoui TC, Tepper NK, et al. U.S. selected practice recommendations for contraceptive use, 2016. *MMWR Recomm Rep* 2016;65(No. RR-4). <http://dx.doi.org/10.15585/mmwr.rr6504a1>

# Resources and References

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## Utah Department of Health

- Bureau of Epidemiology  
Phone: 801-538-6191  
24-Hour Urgent Event & Disease Reporting  
1-888-EPI-UTAH (374-8824)
- Utah Birth Defects Network  
Children with Special Health Care Needs  
1-866-818-7096
- Mother to Baby- Utah  
Pregnancy Risk Line  
1-866-626-6847

## Office of Population Affairs (OPA)

- Zika Toolkit for Healthcare Providers  
OPA has developed a Zika Toolkit for Title X-funded grantees and other healthcare providers that care for non-pregnant women and men of reproductive age. The toolkit suggests ways to put the CDC guidance into practice. It contains information about how to counsel women and men about family planning in the context of Zika, job aids and client handouts, and outreach materials. Download the Zika toolkit [here](#).





# Pregnant?

**Warning:** Zika can cause certain birth defects  
**There is no vaccine to prevent Zika virus infection**

## Protect your pregnancy

### From getting Zika from mosquito bites



#### Daytime is most dangerous

Mosquitoes that spread Zika are aggressive daytime biters. They can also bite at night.

#### Use insect repellent

**It's safe and it works!** Read the label and follow the directions.



#### Cover your skin

Wear long-sleeved shirts and long pants. For extra protection, treat clothing with permethrin.

#### Mosquito-proof your home

Use screens on windows and doors.  
Use air conditioning when available.  
Eliminate standing water.



### From getting Zika from sex



#### Don't have sex

Don't have sex with your male partner during your pregnancy.

OR

#### Use a condom

Use a condom the right way every time you have vaginal, anal, or oral sex during your pregnancy.



#### Talk to your healthcare provider

If you think your male partner may have or had Zika, tell your healthcare provider if you had sex without a condom.

#### For more information:

[www.cdc.gov/chikungunya](http://www.cdc.gov/chikungunya)

[www.cdc.gov/dengue](http://www.cdc.gov/dengue)

[www.cdc.gov/zika](http://www.cdc.gov/zika)



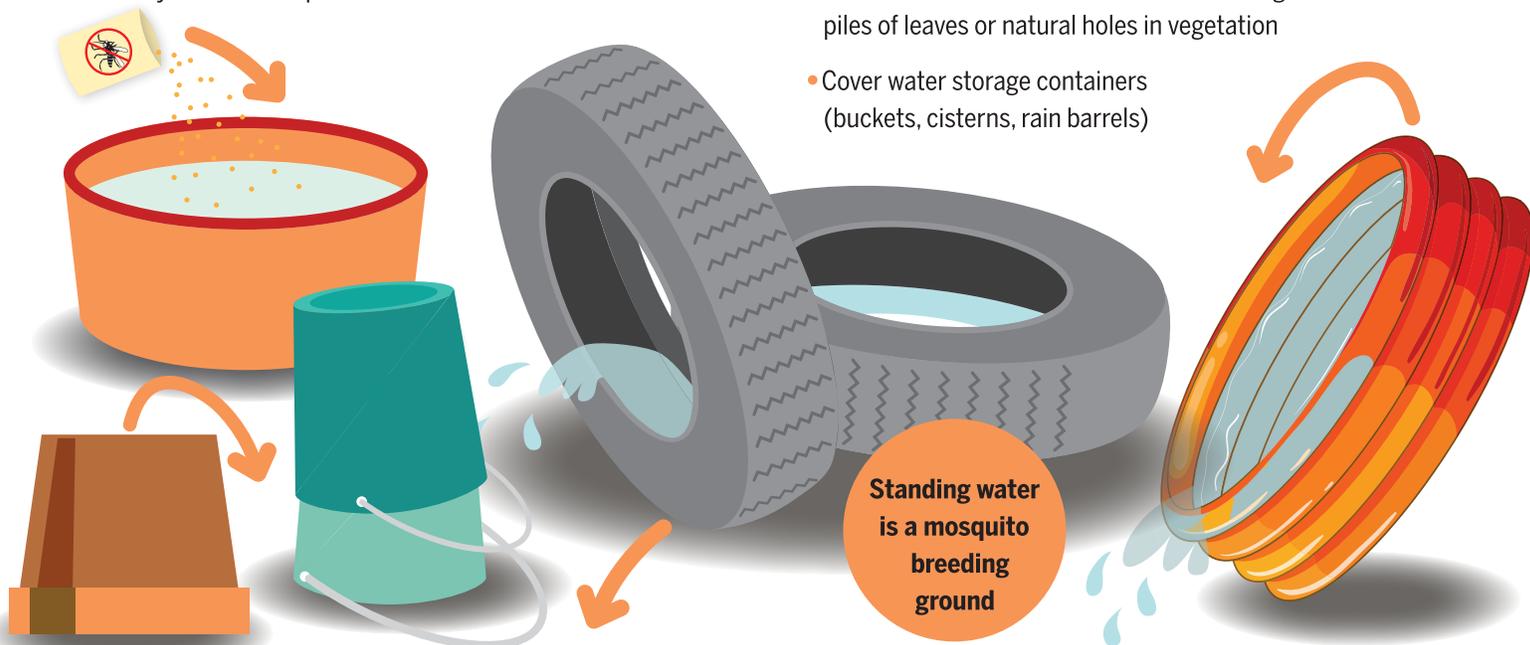
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Control and Prevention

# HOW DO YOU PREVENT ZIKA IN UTAH?

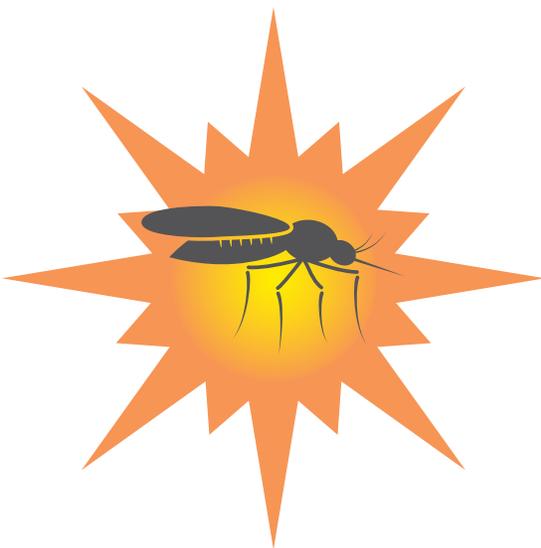
## TIP 'n TOSS

### WHAT ARE SOME THINGS I CAN DO?

- Clean up around your home and yard
- Get rid of anything you don't need that can hold water
- Use larvicides (**Mosquito Dunks**® or **Mosquito Torpedoes**®) where you can't dump out water
- **Tip 'n Toss** containers after every rain and at least once a week
- Dump out standing water in flowerpots and planters, children's toys, pet dishes
- Don't let water accumulate in old tires, rain gutters, piles of leaves or natural holes in vegetation
- Cover water storage containers (buckets, cisterns, rain barrels)

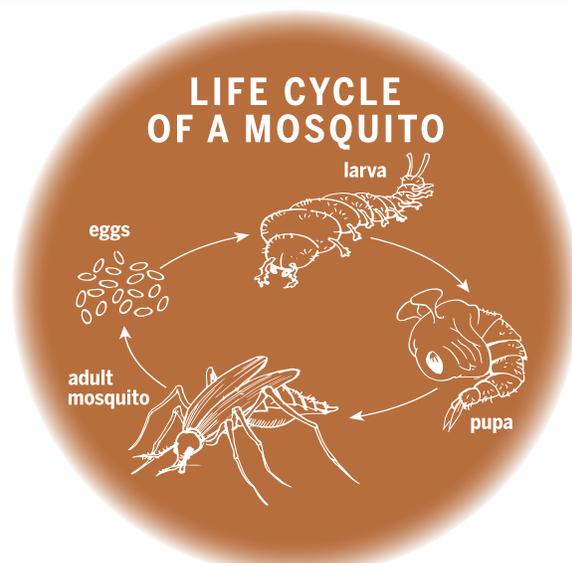


NO VACCINE TO PREVENT • NO MEDICINE TO TREAT



### MOSQUITO LIFE CYCLE

- Mosquitoes need standing water to breed
- Adult, female mosquitoes lay their eggs inside containers
- Mosquitoes lay hundreds of eggs at a time
- Mosquitoes go from eggs to adults in a week to 10 days
- Only female mosquitoes bite
- *Aedes* mosquitoes bite primarily during the day, but some bite at night



*Find out what it takes to stop Zika*  
Please visit [health.utah.gov/epi/diseases/zika](http://health.utah.gov/epi/diseases/zika)



UTAH DEPARTMENT OF  
**HEALTH**

# For Pregnant Women: A Positive Zika Virus Test

## What does it mean for me?



**CDC understands that pregnant women may be worried and have questions about Zika virus. A positive test result might cause concerns, but it doesn't mean your baby will have birth defects. Learn more about what you might expect for your pregnancy if you get a positive test result for Zika.**



### **I tested positive. What happens next?**

If you get a positive test result for Zika during pregnancy, it signals to your doctor or other healthcare provider to watch your pregnancy more carefully. CDC recommends steps your doctor can take to help care for you during your pregnancy. Your doctor or other healthcare provider might do more ultrasounds or other tests to check the growth and development of your fetus and to look for signs of Zika virus infection during your pregnancy.

### **What are ultrasounds?**

Ultrasounds are a safe and routine way for doctors or other healthcare providers to see the fetus during pregnancy. An ultrasound is usually done between 18-20 weeks of pregnancy as part of normal care. Extra ultrasounds are sometimes done later in pregnancy when doctors need more information about the fetus.

### **Does Zika virus cause microcephaly or other problems for the fetus?**

Recently, researchers concluded that Zika virus infection during pregnancy can cause microcephaly and other severe brain defects. They are working quickly to study the full range of other potential health problems that Zika virus infection during pregnancy may cause.

### **Does a positive Zika virus test mean my baby will have birth defects?**

Studies reported that some, but not all, babies born to women with positive Zika test results during pregnancy were born with microcephaly and other problems. At this time, we don't know how often a baby will have microcephaly or other problems if a woman is infected with Zika while she is pregnant. Your doctor or other healthcare provider will watch your pregnancy more closely if you have a positive Zika virus test.

### **How will my doctor or other healthcare provider know if my baby has microcephaly?**

Your doctor or other healthcare provider will use ultrasound screening to look for microcephaly and other birth defects during your pregnancy. Ultrasounds can show some, but not all, problems with your baby's development during pregnancy. For example, microcephaly can sometimes be seen on the 18-20 week ultrasound but is more commonly detected later in the second trimester or early in the third trimester. To look for problems after birth, your baby's doctor will perform a careful physical exam of your baby, recommend routine hearing screening, and follow up with more exams and tests as needed.

# US Zika Pregnancy Registry

## What Pregnant Women Need to Know



### What is the purpose of the registry?

CDC developed the US Zika Pregnancy Registry to:

- ◆ Learn more about the effects of Zika virus infection (Zika) during pregnancy.
- ◆ Learn more about the growth and development of babies whose mothers had Zika while pregnant.

CDC will collect health information about Zika among pregnant women and babies across the United States for the Registry. CDC and health departments will use the information from this Registry to help pregnant women and families affected by Zika. The knowledge gained from this Registry will help doctors and other healthcare providers care for pregnant women and their babies.

### Who is being included in the registry?

Women in the United States who may have been infected with Zika during pregnancy (but did not necessarily show symptoms of Zika) and their babies can be included in the Registry. Puerto Rico has established a separate Zika Active Pregnancy Surveillance System (ZAPSS).

### What will be done with the information collected?

The identity of people in the Registry will be kept private and secured. The information your doctor or other healthcare provider shares will be added to the Registry with information about other pregnant patients with Zika, and the babies born to these mothers, to help CDC and health departments develop a clearer picture of how Zika affects pregnant women and their babies.

### What do I have to do to be in the registry?

You will not need to do extra paperwork, go to extra appointments, or have extra tests to be part of the Registry. If your healthcare provider is participating in this Registry, she/he will share information about your health with your health department and the CDC. Your health department and CDC will work with your doctor and other healthcare providers to collect all of the information needed. For this Registry, your health department and CDC will:

- ◆ Collect information about your pregnancy,
- ◆ Collect information about you and your baby around the time the baby is born, and
- ◆ Contact the baby's doctor or other healthcare provider to collect information about the baby's growth and development up to his or her first birthday.

If you change doctors or healthcare providers, please refer the new healthcare providers to CDC's US Zika Pregnancy Registry webpage (shown below).

As established in the HIPAA Privacy Rule (45 CFR 164.528), you have the right to request from your healthcare provider an accounting of the disclosure of your protected health information at any time.

### How much does this cost?

Being in the Registry will not cost you any money.

### What if I have questions?

- ◆ For more information about the Registry, visit CDC's Registry webpage ([www.cdc.gov/zika/hc-providers/registry.html](http://www.cdc.gov/zika/hc-providers/registry.html)) or contact CDC-INFO by calling 800-232-4636 (TTY 888-232-6348) or submitting an online inquiry ([wwwn.cdc.gov/dcs/ContactUs/Form](http://wwwn.cdc.gov/dcs/ContactUs/Form)).
- ◆ If you have questions about testing for Zika virus infection, please contact your healthcare provider.
- ◆ If you would like to speak to someone about a possible Zika virus infection or diagnosis during pregnancy, Mother to Baby experts are available to answer questions in English or Spanish by phone, text, or chat ([www.MotherToBaby.org](http://www.MotherToBaby.org)). The free, confidential service is available Monday - Friday from 8am - 5pm (local time).



# WHEN TO TEST FOR ZIKA VIRUS

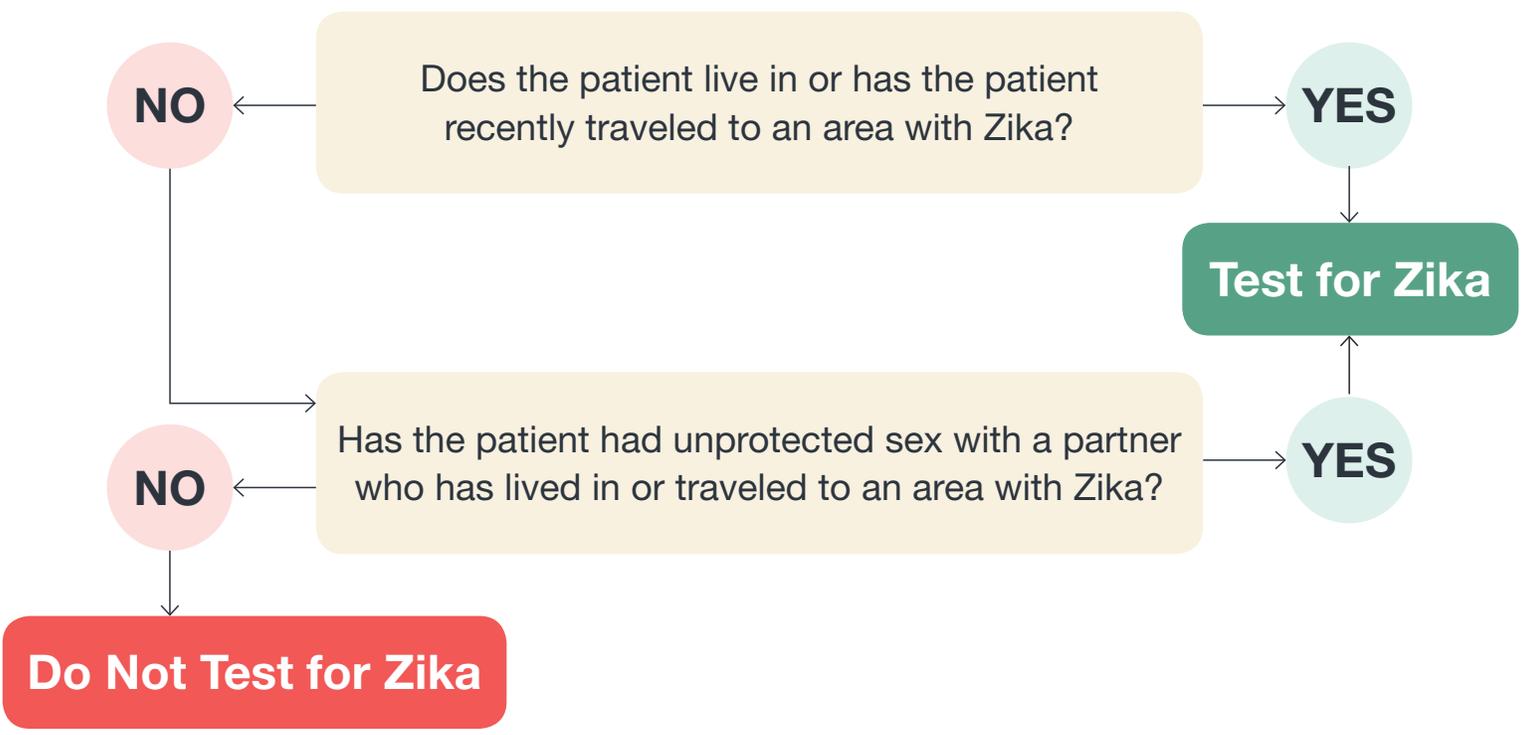


As a healthcare provider, you decide if a patient should be tested for Zika virus infection. The algorithm below will help you determine whether or not to test your patient for Zika virus infection. For information on which test to use, see [CDC's interim guidance](#).

**If your patient is**

- Experiencing or has recently experienced symptoms of Zika\*
- An asymptomatic pregnant woman

**Ask the following questions**



\*Healthcare providers should review their local and state health jurisdiction guidelines regarding testing of patients with clinically compatible illness without known travel or sexual exposures.

## CDC does not recommend Zika virus testing for asymptomatic

- Men
- Children
- Women who are not pregnant



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# Doctor's Visit Checklist: For Pregnant Women Who Traveled to an Area with Zika\*



**If you are pregnant and traveled to an area with Zika, you should talk to your doctor or other healthcare provider, even if you don't feel sick.**

Bring this checklist to your visit to make sure you don't forget to discuss anything important.

**Here are some topics and questions you may want to discuss with your doctor or other healthcare provider:**

- ✓ When did you travel to an area with Zika?
  - » Where did you travel?
- ✓ In what trimester was your pregnancy when you traveled to an area with Zika?
- ✓ Did you have any symptoms of Zika during your trip or within 2 weeks of returning?
  - » The most common symptoms of Zika are fever, rash, joint pain, and red eyes.
- ✓ Should you be tested for Zika virus?
  - » If you have symptoms of Zika, testing for Zika should be done within 7 days of when the symptoms began.
  - » In some cases, if you do not have symptoms of Zika, testing for Zika can be offered.
- ✓ Do you need an ultrasound?
- ✓ Do you need to be referred to a maternal-fetal medicine specialist?
- ✓ How can you prevent sexual transmission of Zika virus?

\* Check <http://wwwnc.cdc.gov/travel/notices/> for the most up-to- date travel recommendations.

## Resource List:

Areas with Zika Virus: <http://wwwnc.cdc.gov/travel/page/zika-information>

Facts About Microcephaly: <http://www.cdc.gov/ncbddd/birthdefects/microcephaly.html>

Zika Virus and Pregnancy: <http://www.cdc.gov/zika/pregnancy/index.html>

Pregnant Women: How to Protect Yourself: <http://www.cdc.gov/zika/pregnancy/protect-yourself.html>

Zika Virus Prevention: <http://www.cdc.gov/zika/prevention/index.html>

Zika and Sexual Transmission: <http://www.cdc.gov/zika/transmission/sexual-transmission.html>

[www.cdc.gov/zika](http://www.cdc.gov/zika)



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# ZIKA VIRUS TESTING FOR ANY PREGNANT WOMAN NOT LIVING IN AN AREA WITH ZIKA



CDC understands that a pregnant woman may be worried and have questions about Zika virus infection (Zika) during pregnancy. Learn more about Zika virus testing for a pregnant woman and what you might expect if you have Zika during your pregnancy.



## How Zika spreads.

A pregnant woman who does not live in an area with Zika can catch the virus from a mosquito bite while visiting an area where mosquitoes are spreading Zika. She can also get Zika through sex with an infected partner. For more information on transmission of Zika, visit [www.cdc.gov/zika/transmission](http://www.cdc.gov/zika/transmission).

## What CDC knows about Zika virus and pregnancy.

- Zika virus can spread from mother to fetus during pregnancy and around the time of birth.
- Zika virus can cause birth defects and has been linked with other problems in infants.



## What CDC doesn't yet know about Zika virus and pregnancy and is researching quickly to find out.

If a woman is infected during pregnancy, we don't know

- How likely it is that the virus will affect her or her pregnancy.
- How likely it is that the virus will be passed to the fetus.
- How likely it is that the fetus, if infected, will have birth defects.
- When in pregnancy the infection might harm the fetus.

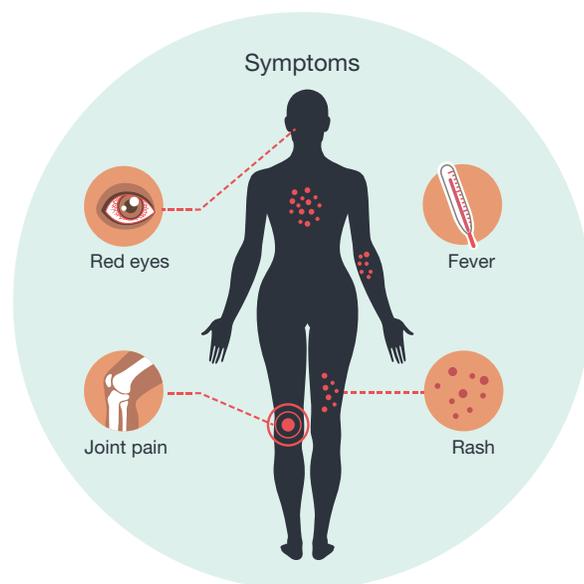
[www.cdc.gov/zika](http://www.cdc.gov/zika)



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## How can a pregnant woman find out if she has Zika?

- If a pregnant woman gets infected with Zika, the virus will be in her blood and urine for up to two weeks. If she gets sick with a fever, joint pain, rash, or red eyes, doctors or other healthcare providers can test small amounts of her blood and urine and test them for Zika virus.
- If she never feels sick, or if more than two weeks have gone by since possible exposure to Zika (through travel or sexual contact with an infected partner), doctors can order a different test to look for evidence of Zika infection.



## What do the test results mean?

### What happens if samples from a pregnant woman test positive?

If a woman has a positive test result for Zika during pregnancy, it signals to her doctor or other healthcare provider to watch her pregnancy more closely, meaning the provider might do more ultrasounds or other tests to check the growth and development of her fetus and check for any signs of Zika virus infection. CDC recommends steps for doctors or other healthcare providers to help care for pregnant women.

### What happens if a pregnant woman's test results are inconclusive (not positive or negative)?

Sometimes, if the tests aren't clearly positive or negative, the results are considered inconclusive. If the test results are inconclusive, her doctor may follow the CDC recommendations for a positive test result, meaning he or she might do more ultrasounds or other tests to monitor your pregnancy.

### What happens if a pregnant woman tests negative?

If she tests negative, her doctor may check the growth and development of the fetus during an ultrasound and check for any signs of Zika virus infection. If there are no signs of Zika virus infection, routine prenatal care is recommended. If her doctor sees signs of Zika virus infection during an ultrasound, then the doctor may do additional tests.



# KEY ZIKA CONSIDERATIONS FOR HEALTHCARE SETTINGS



## Background

Zika is a mosquito-borne disease that is currently spreading throughout many countries and territories, including a small area in the continental United States. CDC recommends that healthcare systems (including urgent care, hospitals, physician offices, etc.) prepare for patients seeking a diagnosis and /or symptom management.

CDC continues to evaluate cases of Zika in the United States and US territories and updates guidance as new information becomes available. For more information, visit CDC's Zika website ([www.cdc.gov/zika/index.html](http://www.cdc.gov/zika/index.html)).

## Purpose

In order to prepare for Zika patients coming to your clinics, hospital, or physicians' offices, healthcare systems leaders should ensure the following:

- 1. Healthcare providers** should know the clinical manifestation of Zika virus infection and how to access information about areas with active transmission. Clinicians should be able to assess for risk factors and exposures\* to Zika virus when evaluating patients. It is important that providers are aware that people with Zika virus infection can be asymptomatic or mildly symptomatic, and therefore providers should consider Zika virus disease in the differential diagnosis for patients with appropriate risk factors.
- 2. Healthcare providers** should assess all pregnant women for possible Zika virus exposure\* and evaluate for signs and symptoms of Zika virus disease at every clinical encounter. Testing may be indicated. (Updated Interim Pregnancy Guidance Testing Algorithm: [www.cdc.gov/zika/pdfs/testing\\_algorithm.pdf](http://www.cdc.gov/zika/pdfs/testing_algorithm.pdf)) The Zika Pregnancy Hotline can be accessed by clinicians for questions; call 770-488-7100 and ask for the Pregnancy Hotline.
- 3. Healthcare providers** should advise pregnant women about how to prevent sexual transmission of Zika during pregnancy. ([www.cdc.gov/zika/prevention/protect-yourself-during-sex.html](http://www.cdc.gov/zika/prevention/protect-yourself-during-sex.html))
- 4. Discuss preventive measures** with patients and families. Provide materials with information about risk factors to encourage the use of mosquito bite prevention actions. Patients should protect themselves from mosquito bites for 3 weeks post exposure to prevent further spread of
- the virus. Emphasize risks to families and household contacts as these are at the greatest risk for human-mosquito-human transmission.
- 5. All healthcare personnel** should follow Standard Precautions for all patient care ([www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf](http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf)).
- 6. Healthcare providers** caring for pregnant women should be aware of the requirement for Standard Precautions to be used for labor and delivery care. ([www.cdc.gov/mmwr/volumes/65/wr/mm6511e3.htm](http://www.cdc.gov/mmwr/volumes/65/wr/mm6511e3.htm))
- 7. Internal and external hospital websites** should include a link to ([www.cdc.gov/zika/index.html](http://www.cdc.gov/zika/index.html)) CDC's Zika website to ensure that all staff have access to the most up-to-date guidance and other training and clinical resources.
- 8. Appropriate healthcare staff** should report suspected cases to state or local health departments to facilitate diagnosis.
- 9. Healthcare personnel** should report all pregnant women with laboratory evidence of possible Zika virus infection, with or without symptoms, as well as infants born to these women, to state, tribal, territorial, or local health department officials for enrollment in the US Zika Pregnancy Registry ([www.cdc.gov/zika/hc-providers/registry.html](http://www.cdc.gov/zika/hc-providers/registry.html)).



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## Other Considerations

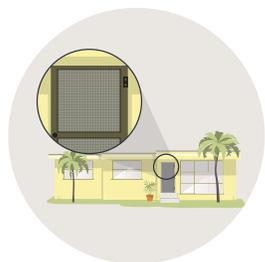
Healthcare systems, urgent care centers, and physician's offices are among the places where patients and visitors expect to see and hear health information. CDC recommends that easy-to-understand educational materials be widely available within healthcare systems for all providers, employees, patients, families, and visitors. **These materials should:**



Encourage pregnant women to avoid travel to areas with Zika and to take steps to prevent mosquito bites.



Wear long-sleeved shirts and long pants.



Stay in places with air conditioning and window and door screens to keep mosquitoes outside.



Treat clothing and gear with permethrin or buy pre-treated items.



Take steps to prevent getting Zika through sex (i.e., use a condom or other barrier against infection).



Encourage patients to contact their healthcare provider if they have other questions about Zika.



Encourage patients and family members to practice simple but effective measures to control mosquitoes at home.



Reducing larval development sites by dumping out small water containers and covering larger water containers are easy ways to reduce the number of mosquitoes around the home. [www.cdc.gov/zika/vector/index.html](http://www.cdc.gov/zika/vector/index.html)

Additional information can be found at: [www.cdc.gov/zika/hc-providers/index.html](http://www.cdc.gov/zika/hc-providers/index.html)

\*Exposure includes travel to an area with Zika and sex without a condom or other barrier protection with a partner who lives in or has traveled to an area with Zika.