



Zika Virus: A Primer

Grand Rounds



First time in history...

“Never before in history has there been a situation where a bite from a mosquito could result in a devastating malformation.”

– Dr. Tom Frieden, former CDC Director
Fortune, April 13, 2016





Today's Presentation

- Zika Virus: The Basics
- CDC Guidance
 - Pregnancy Planning and Contraception
 - Zika and Pregnancy
 - Infants with Possible Congenital Zika Virus Infection
- Preventing Zika Virus Infection
- Preventing the Spread of Zika Virus During Healthcare Delivery
- What is CDC Doing?
- What Can You Do?



Zika Virus: The Basics

What is Zika Virus?

- Single-stranded RNA virus
- Closely related to dengue, yellow fever, Japanese encephalitis, and West Nile viruses
- Primarily transmitted by two *Aedes* species mosquitoes
 - *Aedes aegypti* and *Aedes albopictus* mosquitoes
- Additional modes of transmission
 - Intrauterine and perinatal (mother to fetus)
 - Periconceptual
 - Sexual
 - Laboratory exposure
 - Probable: Blood transfusion



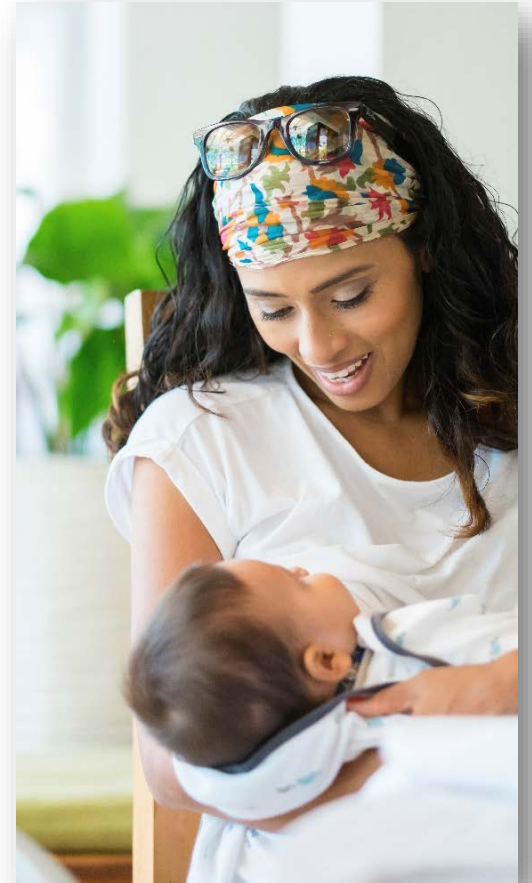
Aedes aegypti mosquito



Aedes albopictus mosquito

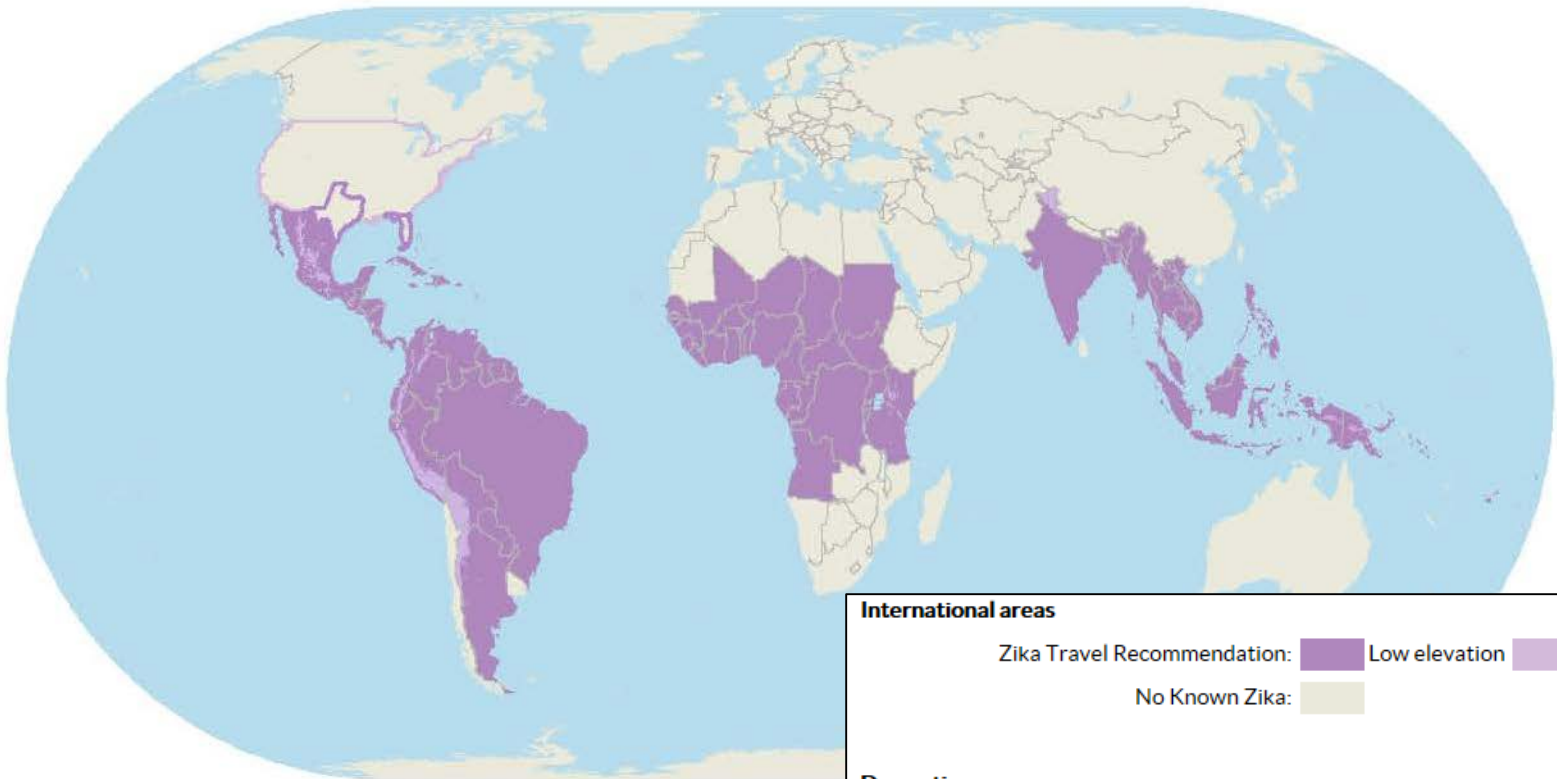
Zika Virus and Breastfeeding

- There are no reports of transmission of Zika virus infection through breastfeeding.
- Benefits of breastfeeding outweigh theoretical risk of possible Zika virus transmission through breast milk
- CDC and the World Health Organization recommend that infants born to women with suspected, probable, or confirmed Zika virus infection, or who live in or have traveled to areas of with risk of Zika, should be fed according to usual infant feeding guidelines





Areas with Risk of Zika



International areas

Zika Travel Recommendation: Low elevation High elevation

No Known Zika:

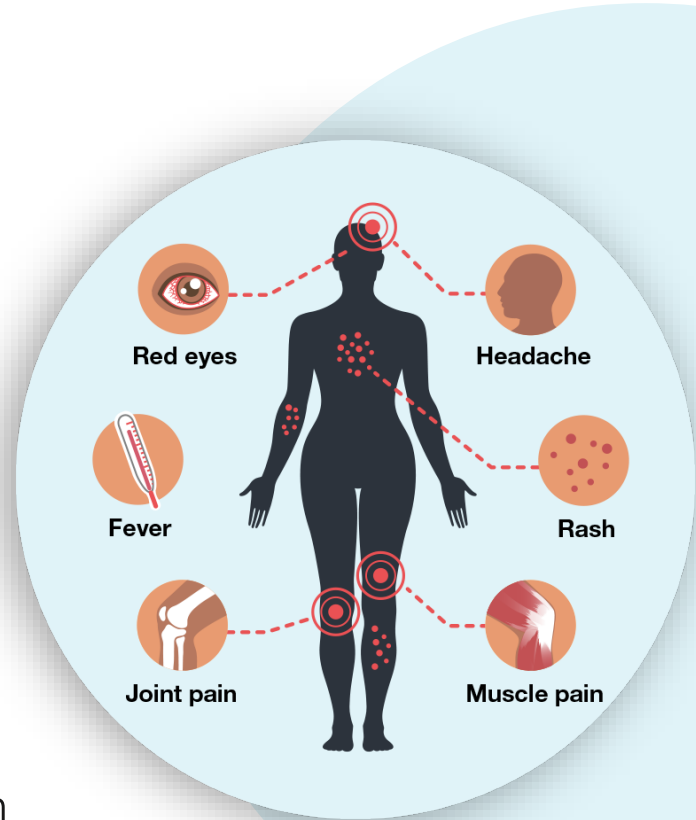
Domestic areas

State reporting Zika:

As of May 16, 2017

Clinical Presentation

- Clinical illness usually mild
- Most common symptoms
 - Conjunctivitis (red eyes)
 - Fever
 - Joint pain
 - Headache
 - Rash
 - Muscle pain
- Symptoms last several days to a week
- Severe disease uncommon
- Fatalities are rare
- Once infected, a person may be protected from future infections



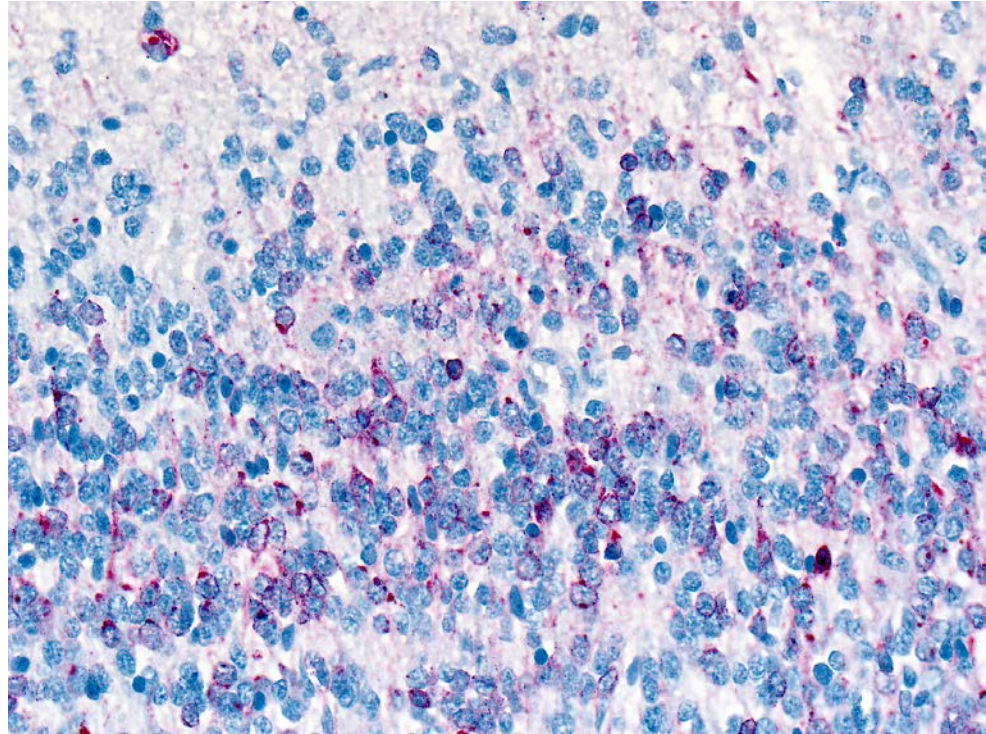
Clinical Management

- No vaccine or specific antiviral treatment
- Treat the symptoms
 - Rest
 - Drink fluids to prevent dehydration
 - Take medicine such as acetaminophen to reduce fever and pain
 - Avoid aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) until dengue can be ruled out to reduce the risk of bleeding



CDC Lab Confirms Zika Virus In Fetal Tissues

- Zika virus has been shown to be present in fetal tissue
- Evidence of Zika virus has been detected in
 - Amniotic fluid
 - Placenta
 - Fetal brain tissue
 - Products of conception
- Zika virus has been found to continue to replicate in infants' brains after birth (Bhatnagar et.al., 2017)



Immunohistochemical staining of Zika virus antigen (red stain) in fetal brain tissue. This staining is present in the same areas where neuronal cell death/necrosis was identified by microscopic review of tissue morphology.

Bhatnagar J, Rabeneck DB, Martines RB, Reagan-Steiner S, Ermias Y, Estetter LBC, et al. Zika virus RNA replication and persistence in brain and placental tissue. *Emerg Infect Dis*. 2017 Mar [Epub ahead of print].

Reference/attribution for image: Ritter JM, Martines RB, Zaki SR. Zika Virus: Pathology From the Pandemic. *Arch Pathol Lab Med*. 2016 Oct 5. [Epub ahead of print]

CDC Lab Confirms Zika Virus In Body Fluids

- Evidence of Zika virus identified in
 - Blood
 - Semen
 - Vaginal fluids
 - Urine
 - Saliva
 - Breast milk



Zika Virus Duration of Detection in Infected People

Body Fluid and Population	Maximum Duration of Detection
Zika virus RNA in serum of non-pregnant people	11-13 days after symptom onset
Zika virus RNA in serum of pregnant women	80 days after symptom onset
Zika virus RNA in whole blood of non-pregnant person	58 days (could not be cultured)
Zika virus RNA in semen <i>Cultured virus from semen</i>	>120 days after symptom onset <i>69 days after symptom onset</i>

- What does prolonged detection of Zika virus RNA mean?
 - Correlation of RNA detection and infectious risk is not known; antibody response may mitigate risk of infectivity and transmission
 - Possible predictor of fetal infection or adverse outcomes
 - Difficult to determine timing of infection
- Most data are individual case reports or small case series and it is unclear how representative they are of population-level risk
- CDC conducting several studies in the continental United States and Puerto Rico

Zika Virus Infection in Pregnant Women

- Pregnant women can be infected
 - Through the bite of an infected mosquito
 - Through sex without a condom with an infected partner
- If a woman is infected around conception
 - Zika virus infection might present risk to fetus
- If infected during pregnancy
 - Zika virus can be passed to the fetus during pregnancy or around the time of birth



Zika Virus in Pregnant Women



- Incidence of Zika virus infection in pregnant women is highly variable by place and time
- Infection can occur in any trimester
- No evidence of increased susceptibility
- No evidence of more severe disease compared with non-pregnant people
- Does not appear to be a higher incidence of Guillain–Barré syndrome

Reynolds MR, Jones AM, Petersen EE, et al. Vital Signs: Update on Zika Virus–Associated Birth Defects and Evaluation of All U.S. Infants with Congenital Zika Virus Exposure — U.S. Zika Pregnancy Registry, 2016. *MMWR Morb Mortal Wkly Rep* 2017;66:366-373. Centers for Disease Control and Prevention, *CDC Health Advisory: Recognizing, Managing, and Reporting Zika Virus Infections in Travelers Returning from Central America, South America, the Caribbean and Mexico*, 2016.

Besnard, M., et al., Evidence of Perinatal Transmission of Zika Virus, French Polynesia, December 2013 and February 2014. *Euro Surveill*, 2014. 19(14): p. 1-5.

Oliveira Melo, A., et al., Zika Virus Intrauterine Infection Causes Fetal Brain Abnormality and Microcephaly: Tip of the Iceberg? *Ultrasound in Obstetrics & Gynecology*, 2016. 47(1): p. 6-7.

Zika Virus Infection is a Cause of Microcephaly

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL REPORT

Zika Virus and Birth Defects — Reviewing the Evidence for Causality

Sonja A. Rasmussen, M.D., Denise J. Jamieson, M.D., M.P.H.,
Margaret A. Honein, Ph.D., M.P.H., and Lyle R. Petersen, M.D., M.P.H.

SUMMARY

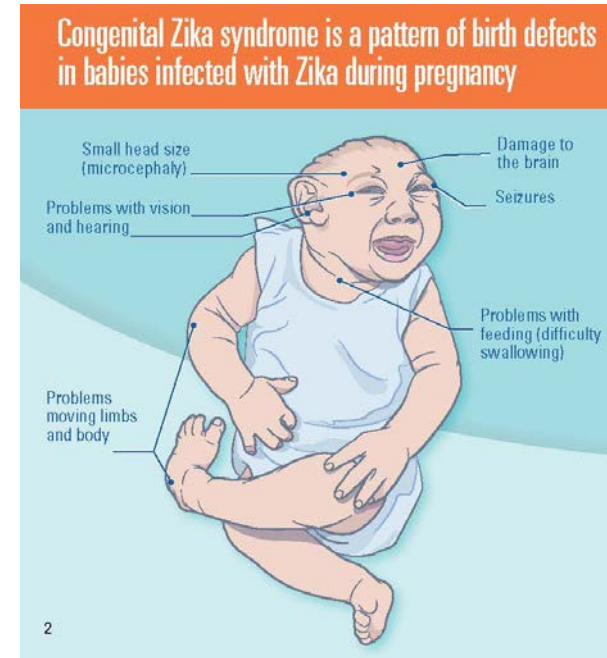
The Zika virus has spread rapidly in the Americas since its first identification in Brazil in early 2015. Prenatal Zika virus infection has been linked to adverse pregnancy and birth outcomes, most notably microcephaly and other serious brain anomalies. To determine whether Zika virus infection

POTENTIAL RELATIONSHIP BETWEEN ZIKA VIRUS INFECTION AND BIRTH DEFECTS

Since the identification of the Zika virus in Brazil in early 2015, the virus has spread rapidly throughout the Americas (www.cdc.gov/zika/geo/active-countries.html). An increase in the number of infants with microcephaly in Brazil

Congenital Zika Syndrome (CZS)

- Pattern of congenital anomalies associated with Zika virus infection during pregnancy that includes
 - Severe microcephaly (small head size) resulting in a partially collapsed skull
 - Thin cerebral cortices with subcortical calcifications
 - Eye anomalies, including macular scarring and focal pigmentary retinal mottling
 - Congenital contractures or limited range of joint motion, such as clubfoot
 - Marked early hypertonia, or too much muscle tone, and symptoms of extrapyramidal involvement
- Infants with normal head circumference at birth may
 - Have brain abnormalities consistent with congenital Zika syndrome
 - Develop microcephaly after birth



Zika Virus (ZIKV) Duration of Detection in Infected People

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

September 30, 2016

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

Emily E. Petersen, MD¹; Dana Meaney-Delman, MD¹; Robyn Neblett-Fanfair, MD¹; Fiona Havers, MD¹; Titilope Oduyebo, MD¹; Susan L. Hills, MBBS¹; Ingrid B. Rabe, MBChB¹; Amy Lambert, PhD¹; Julia Abercrombie, MPH¹; Stacey W. Martin, MSc¹; Carolyn V. Gould, MD¹; Nadia Oussayef, JD¹; Kara N.D. Polen, MPH¹; Matthew J. Kuehnert, MD¹; Satish K. Pillai, MD¹; Lyle R. Petersen, MD¹; Margaret A. Honein, PhD¹; Denise J. Jamieson, MD¹; John T. Brooks, MD¹

US Zika Pregnancy Registry: First Report

Research

JAMA | Original Investigation

Birth Defects Among Fetuses and Infants of US Women With Evidence of Possible Zika Virus Infection During Pregnancy

- Among pregnant women in the United States with laboratory evidence of possible Zika virus infection:
 - Overall about **6%** of fetuses or infants had birth defects potentially related to Zika virus
 - The proportion of pregnancies with birth defects was similar (around **6%**) among symptomatic and asymptomatic pregnant women
 - Among women with infection in the 1st trimester of pregnancy, birth defects were reported in **11%** of fetuses or infants

Baseline Prevalence of Birth Defects Observed with Zika Virus

- Used data from birth defects surveillance systems in Massachusetts, North Carolina, and Atlanta, Georgia, during pre-Zika outbreak years (2013-2014)
- Compared with data from US Zika Pregnancy Registry
- Prevalence of Zika-related birth defects before Zika outbreak in the Americas:

3 out of every 1,000 births

- Proportion of infants with birth defects among completed pregnancies with possible Zika infection (2016):

58 out of every 1,000 completed pregnancies

Researchers estimate a

**20-fold
increase**

in Zika-related birth defects in pregnancies with possible Zika virus infection compared with pre-Zika outbreak years

Vital Signs Report

Zika Virus: Protecting Pregnant Women and Babies

44

States reported pregnant women with evidence of Zika virus infection in 2016

about
1 in 10

Pregnant women with confirmed Zika virus infection had a fetus or baby with birth defects

only
1 in 4

Babies with possible congenital Zika infection were reported to have received brain imaging after birth



Vital^{CDC}signs™

www.cdc.gov/vitalsigns/zika-babies





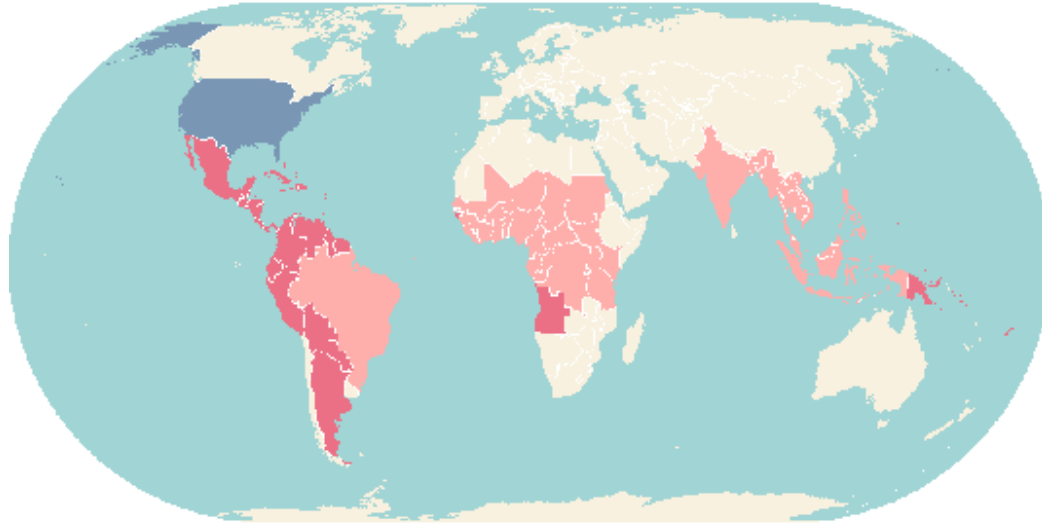
CDC Guidance: Pregnancy Planning and Contraception

Zika Virus and Sexual Transmission

- Zika virus can be passed through sex from a person who has the virus
 - Even if the infected person does not have symptoms at the time.
 - Before their symptoms start, while they have symptoms, and after their symptoms end.
 - Even if the infected person never develops symptoms.
- Sex includes vaginal, anal, oral sex, and the sharing of sex toys
- Sexual exposure includes sex without a condom with a person who traveled to or lives in an area with risk of Zika.



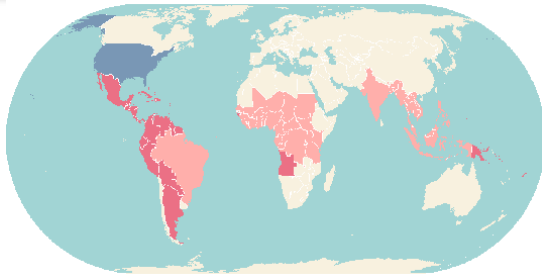
Testing Recommendations and Timeframes to Wait Before Trying to Conceive by Geographic Location



- Areas with a CDC Zika travel notice
- Areas with risk of Zika but no CDC Zika travel notice
- United States

Women and Their Partners Thinking about Pregnancy

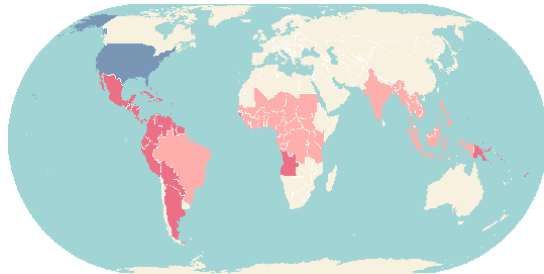
Length of time to wait to conceive after travel to areas with a CDC Zika travel notice	
Female Traveler	Male Traveler
Use condoms or do not have sex for at least 8 weeks after travel to an area with risk of Zika (if she doesn't have symptoms) or for at least 8 weeks from the start of her symptoms (or Zika virus infection diagnosis)	Use condoms or do not have sex for at least 6 months after travel to an area with risk of Zika (if he doesn't have symptoms) or for at least 6 months from the start of his symptoms (or Zika virus infection diagnosis)



- Areas with a CDC Zika travel notice
- Areas with risk of Zika but no CDC Zika travel notice
- United States

Women and Their Partners Thinking About Pregnancy

Length of time to wait after travel to areas with a risk of Zika but no CDC travel notice		
	Women	Men
Positive Zika test <u>or</u> Zika virus infection symptoms	Wait <i>at least</i> 8 weeks after positive result or symptoms start	Wait <i>at least</i> 6 months after positive result or symptoms start
No testing performed or negative test	Talk with doctor or healthcare provider	Talk with doctor or healthcare provider

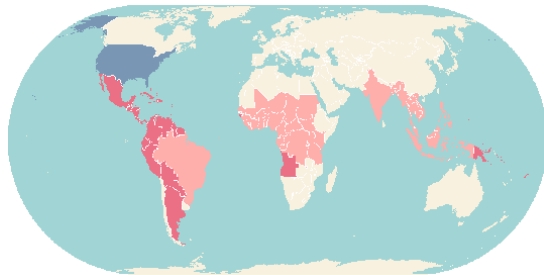


- Areas with a CDC Zika travel notice
- Areas with risk of Zika but no CDC Zika travel notice
- United States

Women and Their Partners Thinking About Pregnancy

People who live in areas with a risk of Zika, with or without a CDC travel notice

- Take steps to [prevent mosquito bites](#).
- Talk with a healthcare provider about pregnancy plans, their risk of Zika virus infection, the possible health effects of Zika virus infection on a baby, and ways to prevent Zika.
- If they develop symptoms of Zika virus infection and test positive for the virus, they should follow the suggested timeframes mentioned previously before trying to conceive.



- Areas with a CDC Zika travel notice
- Areas with risk of Zika but no CDC Zika travel notice
- United States



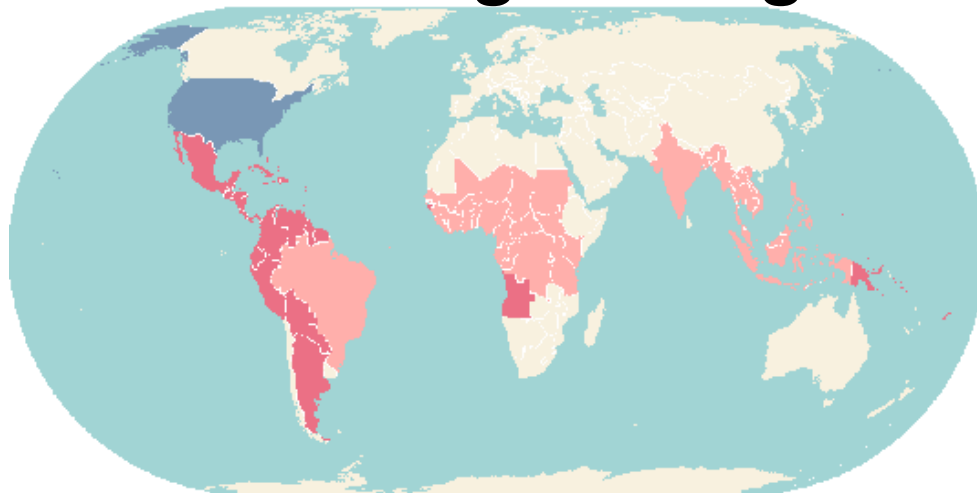
Pregnancy Planning and Access to Contraception

- Preventing Zika virus infections during pregnancy includes supporting women who want to delay or avoid pregnancy to reduce risk of Zika-related pregnancy complications
- If a woman decides to wait to conceive, HCPs should discuss
 - Strategies to prevent unintended pregnancy
 - Use of the most effective contraceptive methods (including long-acting reversible contraception) that can be used correctly and consistently
 - Role of correct and consistent use of condoms, in addition to other birth control method used, in reducing the risk for STIs, including Zika virus infection



CDC Guidance: Zika Virus Infection and Pregnancy

Updated Guidance: Testing for Pregnant Women



Areas with a CDC Zika travel notice:
Pregnant women should be tested for Zika virus infection, regardless of whether or not they have symptoms.



United States: See domestic testing guidance.



Areas with risk of Zika but no CDC Zika travel notice:
Pregnant women should be tested if symptomatic or if their fetus has abnormalities on an ultrasound that may be related to Zika infection. Because the level of risk of Zika virus infection is unknown in these areas, routine testing is not recommended for pregnant women who have traveled to those areas but who do not have symptoms. However, testing may be offered on a case-by-case basis.

Updated Guidance: Testing of Asymptomatic Pregnant Women Living in or Frequently Traveling to Areas with a CDC Zika Travel Notice



“Prolonged IgM Antibody Response in People Infected with Zika Virus: Implications for Interpreting Serologic Testing Results for Pregnant Women” May 5, 2017

1. Screen pregnant women for risk of Zika virus exposure and symptoms of Zika virus infection. Promptly test pregnant women with NAT if they become symptomatic during their pregnancy or if a sexual partner tests positive for Zika virus infection.
2. Consider NAT testing at least once per trimester, unless a previous test has been positive.
3. Consider NAT testing of amniocentesis specimens if amniocentesis is performed for other reasons.
4. Counsel pregnant women each trimester on the limitations of IgM and NAT testing.

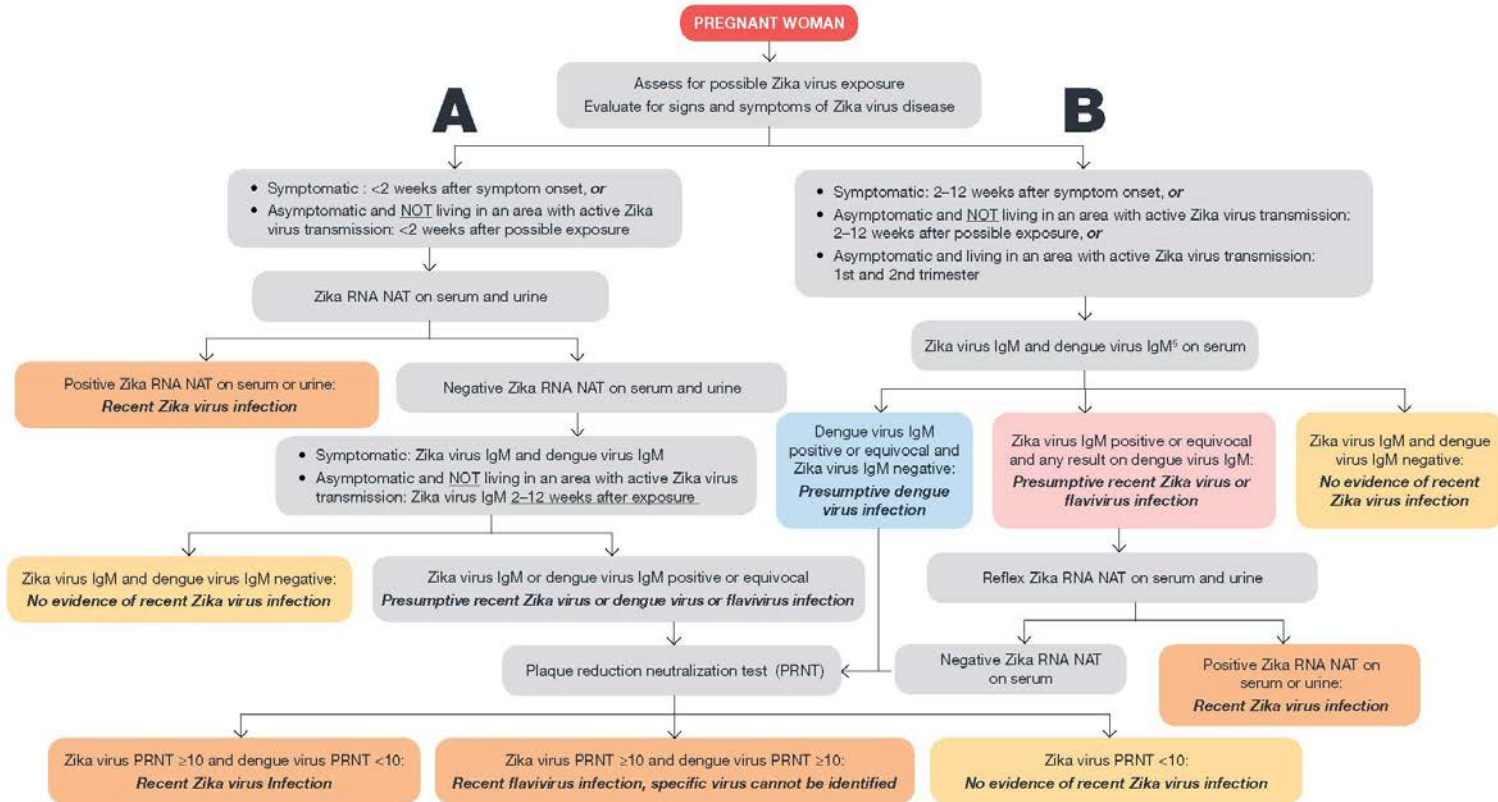
Updated Guidance: Testing as Part of Preconception Counseling for Women Living in or Frequently Traveling to Areas with a CDC Zika Travel Notice



“Prolonged IgM Antibody Response in People Infected with Zika Virus: Implications for Interpreting Serologic Testing Results for Pregnant Women” - May 5, 2017

- Consider IgM testing to determine baseline Zika virus IgM levels as part of preconception counseling
 - Testing before pregnancy can provide information that may help interpret test results in the future.
 - Antibody test results before pregnancy should not be used to determine whether or not it is safe for a woman to become pregnant.

Pregnancy Testing Algorithm



Link: <http://www.cdc.gov/mmwr/volumes/65/wr/mm6521e1.htm>



Updated Guidance: Symptomatic Pregnant Women

- Evaluated <2 weeks after symptom onset
 - Should receive Zika virus NAT testing of serum and urine
 - Positive NAT result confirms diagnosis: *recent maternal Zika virus infection*
 - Negative NAT result does not rule out Zika virus infection
 - Zika IgM and dengue IgM antibody testing should be performed immediately on the same specimen or a subsequently collected specimen
- Evaluated 2–12 weeks after symptom onset
 - Should first have a Zika virus IgM test
 - If positive or equivocal, serum and urine NAT should be performed

https://www.cdc.gov/mmwr/volumes/65/wr/mm6529e1.htm?s_cid=mm6529e1_w

<https://emergency.cdc.gov/han/han00402.asp>

Updated Guidance: Asymptomatic Pregnant Women

- Living in areas without risk of Zika, evaluated <2 weeks after last possible exposure
 - RNA NAT testing should be performed on serum and urine
 - If the RNA NAT test is negative, Zika IgM test should be performed 2–12 weeks after exposure
- Living in areas without risk of Zika, evaluated 2–12 weeks after last possible exposure
 - Should receive a Zika virus IgM antibody test
 - If positive or equivocal, serum and urine RNA NAT should be performed
- Living in areas with risk of Zika
 - Asymptomatic pregnant women who live in an area with Zika should receive Zika IgM testing at the start of prenatal care and again during the 2nd trimester.
 - Consider NAT testing at least once per trimester, unless a previous test has been positive



Updated Guidance: Testing Pregnant Women After 12 Weeks

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
 - A negative IgM antibody test or RNA NAT 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.

Clinical management of a pregnant woman with suspected Zika virus infection

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

Prenatal Management: Confirmed or Presumptive Recent Zika Virus or Flavivirus Infection

- Serial ultrasounds every 3-4 weeks to assess fetal anatomy and growth
- Amniocentesis
 - Individualized for pregnant women with confirmed recent Zika virus or flavivirus infection
 - Can be considered for pregnant women with presumptive recent Zika virus or flavivirus infection
- Prevent mosquito bites
 - Remind women who have confirmed or presumptive recent Zika virus infection to protect themselves from mosquito bites to prevent passing Zika virus to others



CDC Materials for Pregnant Women with Suspected Zika Virus Infection

CDC's Response to Zika

WHAT YOU SHOULD KNOW ABOUT ZIKA VIRUS TESTING

For Pregnant Women Who May Have Been Exposed to within the Past Two Weeks

If you or your sex partner live in or recently traveled to an area with Zika, you may have been exposed to Zika virus. You may have questions about Zika and how to find out if you've been infected. Keep reading to learn more about Zika virus testing during pregnancy.

Zika testing is complex

- You may need more than one Zika test: You may find out if you have Zika after one test, but you may need more than one test because the result of one test may not be definitive. You may need different amounts of time for results.
- Understanding test results can be challenging: Zika virus is similar to other viruses that can cause illness. Testing for Zika may also detect these other mosquito-borne viruses. Sometimes even a single type of virus you were infected with. Each test result is important, because it helps determine which virus is most likely and how best to care for you during pregnancy.



PRETESTING COUNSELING CONVERSATION GUIDE FOR HEALTH CARE PROVIDERS

For Pregnant Women with Possible Exposure to Zika or Symptom Onset within the Past Two Weeks

This guide describes recommendations for conducting pretesting counseling for pregnant women if they or their sex partner live in or recently traveled to an area with Zika virus. This material includes sample scripts for pretesting counseling for pregnant women who may have been exposed to Zika, whether or not they have symptoms. This material includes sample scripts for Zika testing and the testing process with patients. Because a lot of content is outlined for discussion, make additional information useful to understand what they are being told.

Pregnant women coming in for Zika testing may feel worried or anxious. Support them by providing them with clear information and avoiding technical terms, and expressing empathy by acknowledging their concerns and feelings during pretesting counseling.

Recommendation	Sample Script
Provide the patient with information on the complexity of Zika testing.	Use one or both of the two following sentences to begin the discussion depending on the clinical context: 1) You may be at risk of having Zika since you or your sex partner recently traveled to (replace "recently" with "within" as appropriate) a Zika-affected area. (For those without symptoms: "I have symptoms.") OR/AND 2) You may be at risk of having Zika because within the past two weeks you had sex without a condom with "him" as appropriate) a Zika-affected area. (For those without symptoms: "You could be at risk now. Based on what you've told me, I think it is best to move forward with testing you for Zika. Before we begin information on what to expect throughout this process." Patients should be informed that more than one Zika test may be required before a final result is determined. You may only need one test to find out whether you have Zika. However, you may need up to three different tests because the result of one test may not tell us the whole story, and you may need to get additional tests to be sure we take all of the necessary steps to make sure your results are accurate. Each test can take different amounts of time. As your healthcare provider, I'm here to answer any questions you may have. • Reassure the patient that this method of testing is normal. • Consider providing the fact sheet "What You Should Know about Zika Virus Testing for Pregnant Women to Zika within the Past Two Weeks."
Patients should be informed that it can be challenging to understand test results.	It can be hard to understand Zika test results for a number of reasons: Mosquitoes can carry many viruses so if someone has been infected with these other viruses in the past, it may be difficult to know which virus is the cause of the illness. It is possible that the test will: 1) detect signs that your body cleared one of these viruses, other than Zika, from your system, 2) detect signs that your body recently cleared Zika virus from your system, or 3) detect that you currently have Zika. Therefore, we may need to do additional testing to figure out whether you actually had Zika or not, and how best to care for you during your pregnancy. • Ask the patient if she has any questions before you move forward with providing information on the test.

CDC's Response to Zika

For Pregnant Women: A Positive Zika Virus Test Result. 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.

If 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 that you should be monitored more closely. CDC recommends steps your doctor can take to help during your pregnancy. Your doctor or other healthcare provider might do more ultrasounds to check the growth and development of your fetus and to look for signs of Zika virus infection.

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 most prenatal visits. 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 or other problems. 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 had 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 healthcare provider will watch your pregnancy more closely if you have a positive Zika virus test result.

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 during your pregnancy. Ultrasounds can show some, but not all, problems with development during pregnancy. For example, microcephaly can sometimes be seen on the first ultrasound but is more commonly detected later in the second trimester or early in the third trimester. Your doctor or other healthcare provider will perform a careful physical exam of your baby, routine hearing screening, and follow up with more exams and tests as needed.

CDC's Response to Zika

WHAT HAPPENS WHEN I AM TESTED FOR ZIKA AND WHEN WILL I GET MY RESULTS?

Getting tested for Zika virus is different from a flu, strep, or pregnancy test, which can be done in a doctor's office. Only a few laboratories (labs) in the U.S. are certified to test for Zika. Also, some tests often have to be shipped to a lab for testing. Several state and local health departments are certified to perform Zika testing. If your health department doesn't currently perform Zika testing, it will coordinate testing with CDC. CDC is receiving hundreds of samples each week. Depending on the lab workload, processing and reporting times may take 1 to 2 weeks. Reporting times may take longer during summer months or when other viruses spread by mosquitoes increase. Here's how testing occurs:

- Need for testing determined**
 - When you visit your doctor, you'll discuss any recent travel and symptoms. Tell your doctor if you are pregnant or planning to become pregnant.
 - Your doctor may decide to test for Zika and other viruses like dengue or chikungunya.
- Health department contacted**
 - If Zika testing is needed, your doctor will get approval from the health department before collecting samples (blood, urine, saliva).
- Samples collected**
 - Your doctor will send you to a laboratory that will collect samples for testing.
 - Your doctor will select the tests that need to be performed and complete paperwork for the health department.
- Samples shipped**
 - After samples are collected, the laboratory ships them to the health department.
 - The health department logs receipt of the samples.
- Samples tested**
 - If your health department has been certified to perform Zika testing, then your samples will be tested there.
 - If your health department is not able to perform testing, your samples will be shipped to CDC and tested.
- Results reported**
 - If your health department performed testing, it will send the results to your doctor.
 - If CDC performed testing, CDC will report results to your health department, which will report the results to your doctor. Your doctor will then report lab test results to you.

www.cdc.gov/zika

© 2016-2017



CS2016-01 July 26, 2017



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

<http://www.cdc.gov/zika/hc-providers/index.html>



CDC Guidance: Infants with Possible Congenital Zika Virus Infection

Update Posted April 2017: New Considerations

- [Evaluation and Testing: Congenital Zika Virus Infection](#)
 - New considerations and clarifying information to update the [August 2016 MMWR](#)
 - Update: Interim Guidance for the Evaluation and Management of Infants with Possible Congenital Zika virus Infection – United States, August 2016



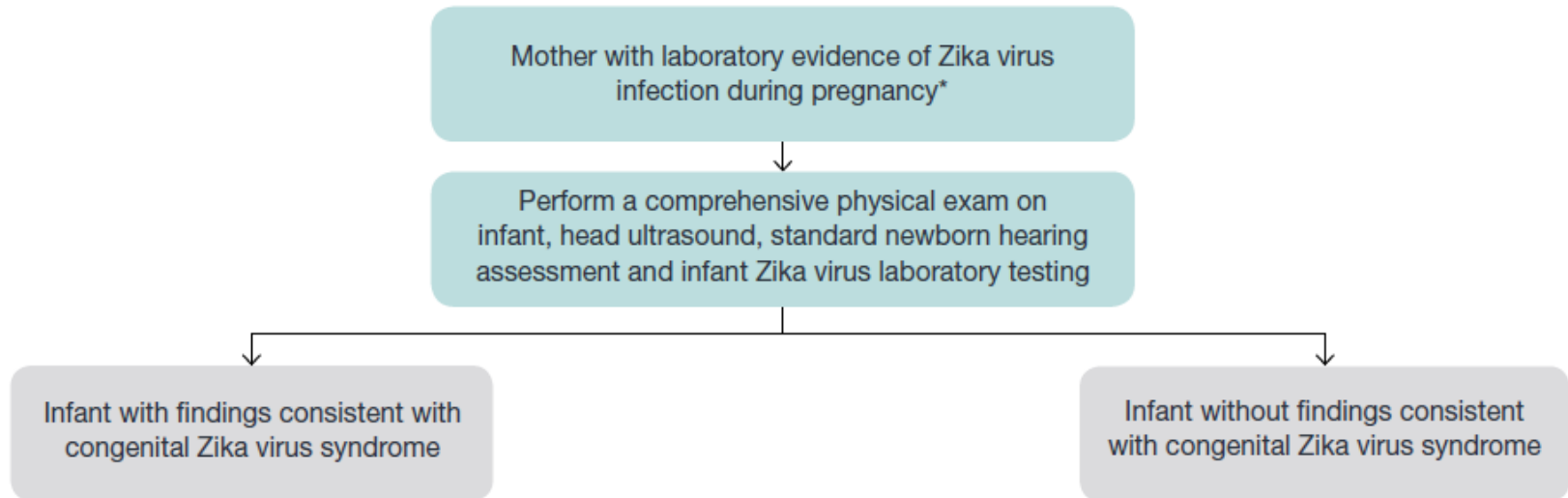


Infants with Possible Congenital Zika Virus Infection

- Testing of infants with possible congenital Zika virus infection should be guided by
 - » Whether the infant has abnormalities consistent with congenital Zika syndrome
 - Test without waiting for maternal test results when infant has clinical or neuroimaging findings suggestive of CZS
 - » The mother's Zika virus testing results
 - All infants born to mothers with laboratory evidence of Zika virus infection should receive:
 - A comprehensive physical exam
 - Neurologic assessment
 - Head ultrasound
 - Zika virus testing
 - Hearing screen
- Test infant before hospital discharge if concerns of loss to follow-up

Infants with Possible Congenital Zika Virus Infection

- Congenital Zika virus infection can be diagnosed by NAT and through serologic testing
- Collect specimens within 2 days of birth when possible
 - » Specimens collected outside this period may still be useful



Testing Babies for Zika Virus Infection: New Considerations

- **Testing of cerebrospinal fluid (CSF)**

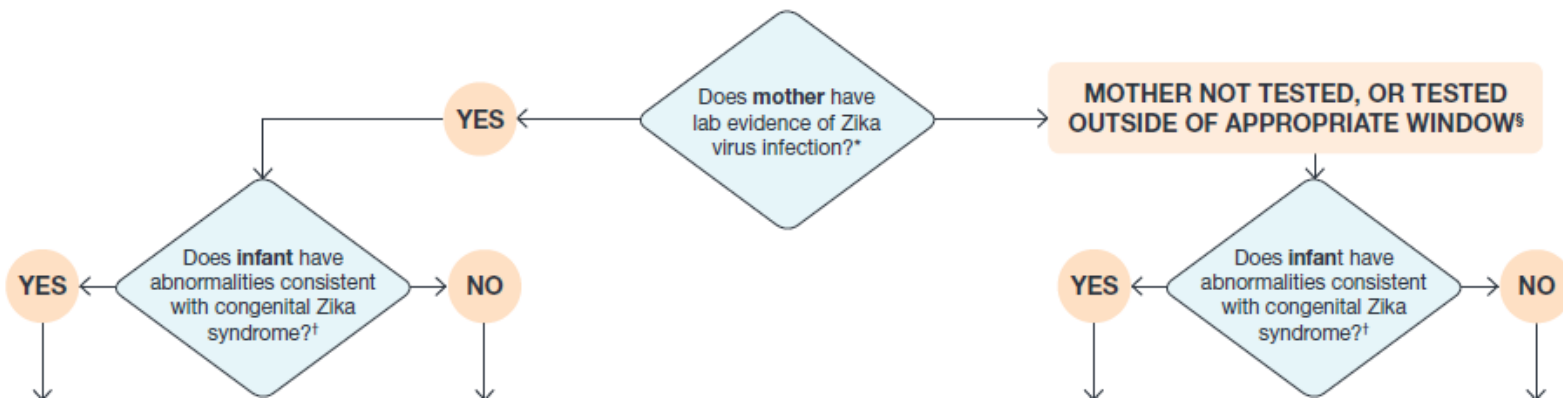
- » Consider obtaining CSF for Zika virus RNA and IgM antibody testing in infants with clinical findings of possible CZS but whose initial laboratory tests are negative on serum and urine
- » Placental Testing
 - » Consider [testing of the placenta](#) for Zika virus PCR





Infants with Possible Congenital Zika Virus Infection

Recommendations for follow up depend on whether these infants have abnormalities consistent with CZS



Initial Evaluation

Initial Evaluation

Infants with abnormalities consistent with CZS born to a mother with lab evidence of Zika virus infection

- Before hospital discharge:
 - ✓ Routine newborn care: physical exam, including occipitofrontal (head) circumference, weight, length
 - ✓ Neurologic exam
 - ✓ Universal hearing screen
 - ✓ Head ultrasound
 - ✓ Testing for congenital Zika virus infection
 - ✓ Complete blood count, metabolic panel and liver enzyme testing
 - ✓ Consult with multiple subspecialists
 - ✓ Referral for comprehensive eye exam by an ophthalmologist
 - ✓ Referral for auditory brainstem response (ABR) hearing evaluation
 - ✓ Consider advanced cranial imaging (e.g., MRI)
 - ✓ Consider transfer to hospital with specialty care
- Refer for a comprehensive ophthalmologic exam and evaluation of hearing by ABR testing before 1 month of age



Consult with Specialists

Infants with abnormalities consistent with CZS and lab evidence of Zika virus infection

- **Neurologist** to determine appropriate neuroimaging and additional evaluation
- **Infectious disease specialist** to evaluate other congenital infections
- **Ophthalmologist** to examine the eye and evaluate for possible cortical visual impairment prior to discharge from hospital or within 1 month of birth
- **Endocrinologist** to evaluate for hypothalamic or pituitary dysfunction
- **Clinical geneticist** to evaluate for other causes of microcephaly or other anomalies if present



Consult with Specialists

Infants with abnormalities consistent with CZS and lab evidence of Zika virus infection

Consultation with the following should also be considered:

- **Orthopedist, physiatrist, physical medicine, rehabilitation physician, and physical therapist** to manage hypertonia, club foot, or arthrogryptic-like conditions
- **Pulmonologist or otolaryngologist** to consult about aspiration
- **Lactation specialist, nutritionist, gastroenterologist, or speech or occupational therapist** to manage feeding issues



Outpatient Management

Infants with abnormalities consistent with CZR and lab evidence of Zika virus infection

- Establish a medical home to facilitate coordination of care
- Provide routine preventive pediatric health care, including immunizations and monthly primary care visits for at least the first 6 months
- Conduct developmental monitoring at each routine visit
- Complete neurologic exam at age 1 and 2 months, then as needed
- Refer patients to developmental specialist and early intervention services
- Repeat ophthalmology exam with retinal assessment at 3 months
- Repeat ABR hearing assessment at age 4–6 months
- Conduct thyroid screening at age 2 weeks and age 3 months
- Refer to appropriate specialists
- Provide information about family support services



Initial Evaluation & Outpatient Management

Infants with lab evidence of Zika and without abnormalities consistent with congenital Zika syndrome

- Before hospital discharge infants should receive
 - Routine care including monitoring of occipitofrontal circumference, length, and weight
- Outpatient management includes routine follow up and
 - Establish medical home
 - Conduct developmental monitoring, encourage caregivers to monitor child's development.
 - Emphasize anticipatory guidance for families.
 - Perform developmental screening at 9 months, or earlier if parental or provider concerns.
 - Refer to ophthalmology within one month of birth. Perform vision screening at every visit.
 - Evaluate hearing: consider repeat ABR testing at 4–6 months or perform behavioral diagnostic testing at age 9 months if ABR is not done at 4–6 months
 - Refer to appropriate specialists
 - Provide information about family support services

Pediatric Evaluation and Follow-Up Care: New Considerations

- **Imaging**

- Perform a head ultrasound before hospital discharge or within 1 month of birth for infants with possible Zika virus infection
- For infants with a small or absent anterior fontanelle and poor visualization of the intracranial anatomy on ultrasound, other imaging (i.e., magnetic resonance imaging or computed tomography) should be considered





Initial Evaluation & Outpatient Management

Infants with abnormalities consistent with congenital Zika syndrome born to a mother without lab evidence of Zika virus infection

- Maternal and infant Zika virus testing
- Infants should receive
 - Routine newborn care including monitoring of occipitofrontal circumference, length, and weight
 - Head ultrasound
 - Age-appropriate standardized validated developmental screening at 9 months
 - CBC, metabolic panel, liver function tests (LFTs)
 - Vision screening and assessment of visual regard
 - ABR testing
- Consider
 - Testing placenta for Zika virus
 - Further neuroimaging if available
 - Transfer to hospital with subspecialty care
- Any children identified with or suspected of delays should be referred to early intervention programs



Pediatric Evaluation and Follow Up: New Considerations

- **Maintain a level of suspicion**
 - For infants without laboratory evidence of Zika virus infection but for whom suspicion for congenital Zika virus infection remains, healthcare providers should
 - » Evaluate for other causes of congenital infection
 - » Consider an ophthalmology exam and auditory brainstem response hearing test before hospital discharge or within 1 month of birth
 - » Consider performing other evaluation and follow up in accordance with CDC guidance

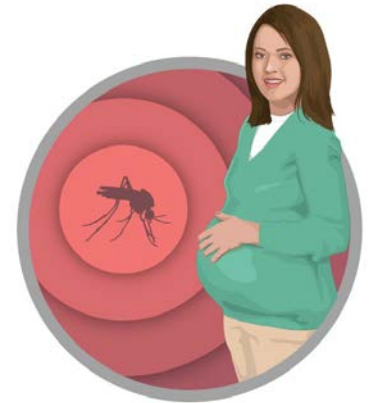


Family and Psychosocial Support

- Families and caregivers of infants with congenital Zika virus infection may require ongoing psychosocial support.
- Families should be empowered to be active participants in their child's monitoring and care.
- Healthcare providers should work closely with parents to ensure that the care plan is consistent with the infant's needs and the family's wishes.
- Families with already limited access to medical care might be affected with a disproportionate burden of Zika virus infection.
- Barriers to care for all affected infants and their families should be addressed by linking them with national, state, and local health programs as well as social services.
- Additional resources for families can be found at:
<http://www.cdc.gov/zika/parents/families-of-newborns-affected-zika.html>

Special Nursing Care Considerations for Newborns with Suspected Congenital Zika Syndrome

- Ensure that recommended screening is received
- Follow up with lab results and counseling of family
- Follow standard precautions in nursery
- [Assist with reporting to the US Zika Pregnancy Registry](#)



Pediatric Evaluation and Follow-up Tools

Initial Evaluation and Outpatient Management During the First 12 Months of Life for Infants with Possible Congenital Zika Virus Infection

CDC's Response to Zika

Interpretation of results of laboratory tests*

Infant test results**

RT-PCR

Positive

Negative

Negative

Abbreviations: RT-PCR = real-time reverse transcriptase PCR; * Infant status, either an asymptomatic infant; ** Laboratory results should be interpreted in the context of the infant's clinical presentation and laboratory evidence of Zika virus infection.

Checklist 1

Initial clinical evaluation & management of infants with laboratory evidence of Zika virus infection and abnormalities consistent with congenital Zika syndrome†

Consideration with:

- 1) Neurologist for determination of appropriate and additional evaluation.
- 2) Infectious disease specialist for diagnostic workup of congenital infections (e.g., syphilis, toxoplasmosis, cytomegalovirus infection, lymphocytic choriomeningitis, and herpes simplex virus infection).
- 3) Ophthalmologist for comprehensive eye exam and for possible cortical visual impairment prior to discharge or within 1 month of birth.
- 4) Endocrinologist for evaluation for hypothyroidism/diabetes.
- 5) Clinical geneticist to evaluate for other causes of neurodevelopmental or other anomalies if present.

Consider consultation with:

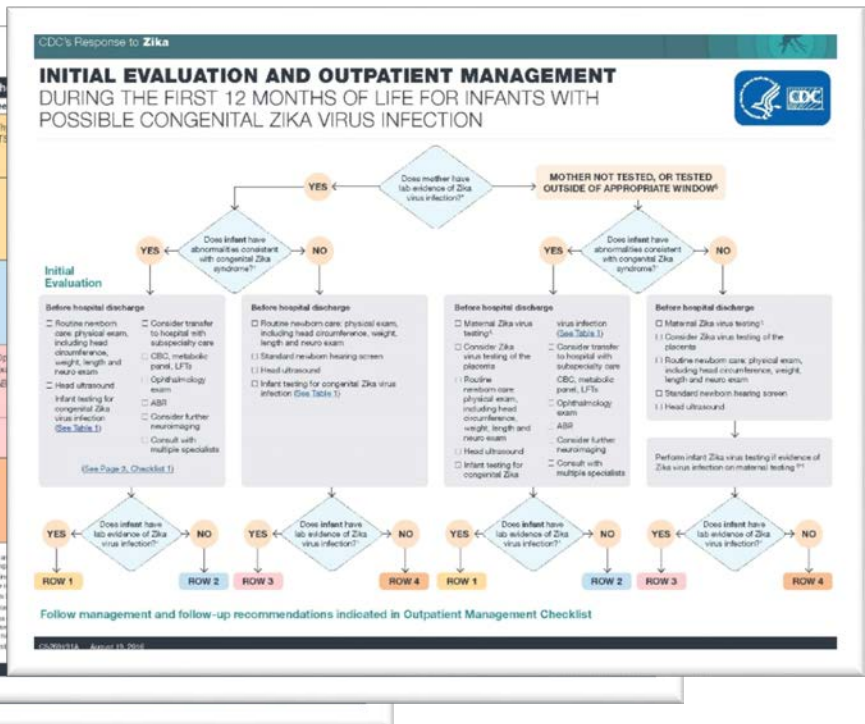
- 1) Ophthalmologist, physical and physical therapist for management of hypotonia, ataxia or other motor anomalies.
- 2) Ophthalmologist or ophthalmologist for concerns about vision.
- 3) Pediatric ophthalmologist, pediatric ophthalmologist, occupational therapist for the management of the infant.
- 4) Perform ABR to assess hearing.
- 5) Perform complete blood count and metabolic panel/liver function tests.
- 6) Provide family and supportive services.

CDC's Response to Zika

Outpatient Management Checklist

2 weeks	Infant with abnormalities consistent with congenital Zika syndrome† and laboratory evidence of Zika virus infection*	RT-PCR (1)
2 weeks	Infant with abnormalities consistent with congenital Zika syndrome† and negative for Zika virus infection*	RT-PCR (1)
2 weeks	Infant with no abnormalities consistent with congenital Zika syndrome† and laboratory evidence of Zika virus infection*	RT-PCR (1)
2 weeks	Infant with no abnormalities consistent with congenital Zika syndrome† and negative for Zika virus infection*	RT-PCR (1)

Abbreviations: RT-PCR = real-time reverse transcriptase PCR; * Infant status, either an asymptomatic infant; ** Laboratory results should be interpreted in the context of the infant's clinical presentation and laboratory evidence of Zika virus infection.



Download at:
<http://www.cdc.gov/zika/pdfs/pediatric-evaluation-follow-up-tool.pdf>



Preventing Zika Virus Infection

Do Not Travel to Areas with Risk of Zika

- Pregnant women should **not** travel to areas with risk of Zika. If a pregnant woman *must* travel, she should
 - Talk with her healthcare provider before she goes
 - Strictly follow steps to prevent mosquito bites during and after the trip
 - Take steps to prevent sexual transmission
 - Talk with her healthcare provider after she returns, even if she doesn't feel sick



Prevent Mosquito Bites

People who live in or travel to an area with risk of Zika should

- Wear long-sleeved shirts and long pants
- Stay and sleep in places with air conditioning or that use window and door screens
- Use insect repellents with one of the following EPA-registered, active ingredients
 - DEET, picaridin, IR3535, oil of lemon eucalyptus, para-menthane-diol, or 2-undecanone
- Treat clothing and gear with permethrin
- Once a week, empty and scrub, turn over, cover, or throw out items that hold water, such as trash containers, tires, buckets, toys, planters, flowerpots, birdbaths or pools



Prevent Sexual Transmission of Zika Virus

A pregnant woman whose partner lives in or has [traveled](#) to an [area with risk of Zika](#) should

- Use condoms correctly every time they have sex, or
- Not have sex

For the duration of the pregnancy, even if the pregnant woman or her partner does not have symptoms or feel sick.



Tips for Parents and Caregivers

For babies and children:

- Dress children in clothing that covers arms and legs.
- For children older than 2 months, use insect repellent on exposed skin.
 - Do not use insect repellent on babies younger than 2 months old.
- Cover crib, stroller, and baby carrier with mosquito netting.



Tips for Parents and Caregivers

Applying insect repellent for babies and children:

- Do not apply repellent onto hands, eyes, mouth, and cut or irritated skin.
- Adults: Spray onto your hands and then apply to a child's face.
- Do not use insect repellent 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.





Standard Precautions to Prevent the Spread of Zika Virus and Other Infectious Agents in Healthcare Settings

Zika Virus Disease in Healthcare Settings

- No reports to date of transmission of Zika virus from infected patients to healthcare personnel or other patients in healthcare settings
- Zika virus has been detected in blood, amniotic fluid, urine, saliva, and genital fluids (including semen and vaginal fluids)





Standard Precautions

- Basic measures to prevent infections that apply to all patient care
- Based on principle that all blood, body fluids, secretions, excretions (except sweat), non-intact skin, and mucous membranes may contain transmissible infectious agents
- Goals
 - Prevent direct contact between a patient's body fluids and the healthcare provider's (HCP) mucous membranes or broken skin
 - Protect HCP and prevent them from transmitting potentially infectious material from one patient to another
 - Avoid percutaneous exposure to contaminated sharp implements



Standard Precautions: Personal Protective Equipment (PPE)

- Healthcare personnel education and training in the use of PPE is an Occupational Safety and Health Administration (OSHA) requirement
- Gloves, gowns, face masks, face shields, goggles
- Facilities should assure availability and accessibility of PPE to HCP
- Educate all HCP on proper selection and correct use of PPE
 - HCPs must assess their risk for exposure and select appropriate PPE
- Examples of obstetric procedures that require increasing amount of PPE
 - Vaginal exam particularly during amniotomy
 - Vaginal delivery including manual removal of placenta
 - Operative procedures



What is CDC Doing?

Many Questions Remain

- What is the level of risk from a Zika virus infection during pregnancy?
- When during pregnancy does Zika virus infection pose the highest risk to the fetus?
- What is the full range of potential health problems that Zika virus infection may cause?
- What other factors (e.g., co-occurring infection, nutrition, symptomatic vs. asymptomatic) might affect the risk for birth defects?
- What is the risk for later health problems in an infant who is infected or who has had exposure to Zika virus but is born without abnormalities?



Collecting Data for Action

Surveillance of Zika virus and its Effects on Pregnant Women, Infants, & Children

US Zika Pregnancy Registry



Zika Active Pregnancy Surveillance System (Puerto Rico)



Proyecto Vigilancia de Embarazadas con Zika (Colombia)



US Zika-Related Birth Defects Surveillance



ArboNET Surveillance of Children with Postnatal Zika



Sharing Up-to-Date Information

- Providing updated clinical guidance
- Responding to your inquiries:
 - Email: ZikaMCH@cdc.gov
 - Zika Pregnancy Hotline: 770-488-7100
 - CDC-INFO: (800-232-4636)



<http://www.cdc.gov/zika>

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

July 25, 2016

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

Titilope Oduyeyo, MD¹; Iroque Igbinosa, MD²; Emily E. Petersen, MD¹; Kara N.D. Polen, MPH³; Satish K. Pillai, MD³; Elizabeth C. Ailes, PhD²; Julie M. Villanueva, PhD³; Kim Newsome, MPH⁴; Marc Fischer, MD⁴; Priya M. Gupta, MPH⁵; Ann M. Powers, PhD⁶; Margaret Lampe, MPH⁶; Susan Hills, MBBS⁴; Kathryn E. Arnold, MD⁷; Laura E. Rose, MTS⁸; Carrie K. Shapiro-Mendoza, PhD⁹; Charles B. Beard, PhD⁴; Jorge L. Muñoz, PhD⁴; Carol Y. Rao, ScD⁷; Dana Meaney-Delman, MD⁸; Denise J. Jamieson, MD⁴; Margaret A. Honsin, PhD²

Developing Tools for Healthcare Providers

Pregnancy & Zika Testing

Restart

Select your profession:

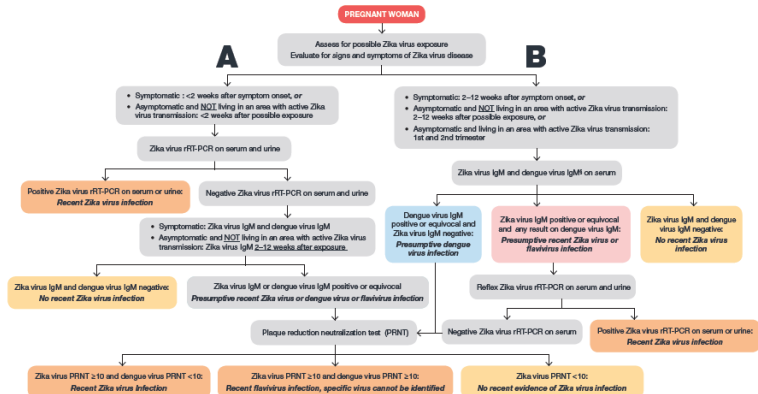
- Obstetrician/Gynecologist
- Family Physician
- Nurse
- Nurse-midwife
- Other healthcare provider
- State health department official
- Local health department official
- Other

◀ Back

CDC's Response to Zika

UPDATED INTERIM PREGNANCY GUIDANCE:

Testing and interpretation recommendations^{1,4,5,6,7} for a pregnant woman with possible exposure to Zika virus* – 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 asymptomatic 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.

¹ Testing includes Zika virus RT-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 currency of circulating flaviviruses. Refer to the laboratory guidance for updated testing recommendations (<https://www.cdc.gov/zika/hc-providers/index.html>, 11/16). Because of the overlap of symptoms in areas where other viral illnesses are endemic, consult for possible dengue or chikungunya virus infection.

² Dengue IgM antibody testing is recommended only for asymptomatic pregnant women.

³ A Zika virus rRT-PCR testing is requested from laboratories without qPCR 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.

⁴ Possible exposure to Zika virus includes travel to or residence in an area with active Zika virus transmission (<https://www.cdc.gov/zika/hc-providers/index.html>), or sex (vaginal sex, penis-to-vagina sex, and sex using penis-to-anus sex, oral sex, mouth-to-mouth sex or mouth-to-mouth 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-mouth, and male condoms cut to create a flat barrier or dental dams for oral sex/mouth-to-mouth) with a partner who traveled to, or lives in an area with active Zika virus transmission.

CDC's Response to Zika

KEY ZIKA CONSIDERATIONS FOR HEALTHCARE SETTINGS

...one disease that is currently spreading throughout many countries and a small area in the continental United States. CDC recommends that including urgent care, hospitals, physician offices, etc.) prepare for patients and/or symptom management.

...update cases of Zika in the United States and US territories and updates information becomes available. For more information, visit CDC's Zika website (<https://www.cdc.gov/zika/>)

...of Zika patients coming to your clinics, no offices, healthcare systems leaders following:

...viders should know the clinical Zika virus infection and how to access areas with active transmission. Clinicians assess for risk factors and exposures¹ in evaluating patients. It is important to be aware that people with Zika virus asymptomatic or mildly symptomatic, providers should consider Zika virus disease diagnosis for patients with appropriate

...viders should assess all pregnant women virus exposure² and evaluate for signs and a virus disease at every clinical encounter, indicated. (Updated Interim Pregnancy Algorithm: www.cdc.gov/zika/pdfs/testing-zika-pregnancy-hotline-can-be-accessed-11-16-16.pdf)

...viders should advise pregnant women about sexual transmission of Zika during (<https://www.cdc.gov/zika/hc-providers/index.html>)

...ive measures with patients and families, with information about risk factors to avoid mosquito bite prevention actions, protect themselves from mosquito bites 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/isolation0907.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/mm6511a3.html)

7. Internal and external hospital websites should include a link to (<https://www.cdc.gov/zika/pdfs/testing-zika-pregnancy-hotline-can-be-accessed-11-16-16.pdf>) 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 offices for enrollment in the US Zika Pregnancy Registry (www.cdc.gov/zika/hc-providers/index.html).



0288916-A August 22, 2016

<https://www.cdc.gov/zika/hc-providers/index.html>

*Free materials available in English, Spanish, and other languages

Resources for Families

CDC's Response to Zika
PREGNANT AND IN AN AREA WITH ZIKA?*
 WARNING: ZIKA IS LINKED TO BIRTH DEFECTS

CDC's Response to Zika
DOCTOR'S VISIT CHECKLIST:
 For Pregnant Women Who Traveled to an Area with Zika*

If you are pregnant and have traveled to pregnancy or up to 8 weeks before see talk to your healthcare provider, even if bring this checklist to your visit to make discuss anything important.

Here are some topics and questions to discuss with your healthcare provider:

INFORMATION TO SHARE

- When did you travel to an area with Zika?
 - How long did you stay?
- In what trimester was your pregnancy at an area with Zika?
- Did you have any symptoms of Zika during 2 weeks of return?
 - The most common symptoms of Zika are joint pain and red eyes.
- Did your partner travel to an area with Zika?
 - When and where did your partner travel?
 - Did your partner have any signs or symptoms including fever, rash, joint pain, or new sores on the lips, or other return?

*Check www.cdc.gov/zika

CDC's Response to Zika
Ideas for Talking to your Children about Zika

For children of all ages, start the conversation by asking: What have you heard about Zika?

- Listen to see if your children have any fears about Zika.
- Learn what your children have heard and correct any misinformation.
- Let your children know that you are open to answering questions and talking about Zika.
- Limit your children's exposure to news reports and media on Zika. When they see a lot of information, it may seem like the risk is bigger than it really is.

Explain what you know about Zika, simply and directly. Here are some facts you can talk about with children.

- Zika is mostly spread by getting bitten by a certain type of mosquito.
- Any person that lives in an area where the type of mosquito that spreads Zika lives could catch Zika through a mosquito bite.
- A mosquito that bit a person who has Zika can get infected and spread it to another person through bites.
- They can only catch Zika if they live in or travel to an area where mosquitoes are spreading Zika and are bit by a mosquito carrying Zika.
- Everyone can take steps to prevent mosquito bites to protect themselves and others. Children can help remind adults about taking steps to protect the family from mosquito bites.
- Most people infected with Zika will not get sick. The people who do get sick will probably only feel a little sick for a few days. They might not even know they have Zika.
- People who do get sick with Zika might get a fever, rash, joint pain (like in elbows or knees), or red eyes.
- There is no medicine or vaccine for Zika. If people get sick they will go to the doctor for some tests. People who get Zika can feel better by getting a lot of rest and drinking fluids and taking medicine for pain.

The government, doctors, health departments, and their community are taking steps to keep everyone healthy.

Your children may have heard about the Zika virus disease (Zika) outbreak and may have questions about it. Children can better cope with any disease outbreak when they know more about what is happening and that they can do something to help protect themselves, family, and friends.

It's important that children understand anyone living in or traveling to an area with Zika may be at risk for getting sick. People who are not living in or traveling to an area with Zika are not likely to get Zika. There are steps we can take to prevent catching and spreading Zika.

By talking your conversation to your child's age, developmental stage, and concerns, you can help him or her understand and cope with the current Zika outbreak.

www.cdc.gov/zika

CDC's Response to Zika
FOR WOMEN: A POSITIVE ZIKA VIRUS TEST

CDC's Response to Zika
HOW TO PROTECT AGAINST MOSQUITO BITES

CDC's Response to Zika
THINKING ABOUT HAVING A BABY?
 WARNING: ZIKA IS LINKED TO BIRTH DEFECTS

Plan Your Pregnancy

With the Zika outbreak, planning your pregnancy is more important than ever. There is no vaccine to prevent Zika virus infection.

If you are thinking about having a baby, your doctor or other healthcare provider can help you plan for a healthy and safe pregnancy. Talk with your doctor about:

- Your plans for having children
- The potential risk of getting Zika during pregnancy
- Your partner's potential exposures to Zika

If you decide that now is not the right time for you to have a baby, work with your doctor or other healthcare provider to find a birth control method that is safe, effective, and works for you and your lifestyle.

Protect yourselves from getting Zika from mosquito bites

Use insect repellent

- Protect yourself and your family from mosquito bites all day and night, whether you are inside or outside.
- Insect repellent is safe and 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. Empty containers with standing water.

Once you're pregnant, protect yourself from getting Zika from sex

Use a condom

- Use a condom every time you have sex during your pregnancy. To be effective, condoms must be used correctly from start to finish, every time you have sex. This includes vaginal, anal, and oral sex.

OR

Don't have sex

- Don't have sex during your pregnancy.

Talk to your healthcare provider

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

For more information: www.cdc.gov/zika

TO PROTECT THEMSELVES TO DO,

well probably be mild and only as drinking fluids to prevent a fever and pain, until dengue can be ruled out to infection, talk to your doctor or other

Zika to others?

mosquito bites. During the first 6 weeks, the virus can be passed from you to others. An infected mosquito can spread others from getting sick, during the first week of your illness. If you are sick, avoid mosquito bites. Stay indoors with air conditioning

of mosquito. Mosquitoes that are active at night. The best way to prevent Zika is to avoid mosquito bites. Mosquitoes that are active at night. The best way to prevent Zika is to avoid mosquito bites. Mosquitoes that are active at night. The best way to prevent Zika is to avoid mosquito bites.

Find the insect repellent that's right for you by using [Zika's search tool](http://www.cdc.gov/zika).

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

For more resources to share with families visit <http://www.cdc.gov/zika/fs-posters/index.html>
 Available in English, Spanish and other languages

Zika Care Connect: Improving Access to Clinical Services

1. Referral Network

Identify specialty healthcare providers

- Maternal-fetal medicine, mental health services, audiology, radiology, pediatric ophthalmology, pediatric neurology, developmental pediatrics, infectious disease, and endocrinology
- Consider joining the network if you are a healthcare professional located within one of the 10 Zika Care Connect focus areas
- Planned expansion to additional jurisdictions in mid-2017

2. Professional Resources

Information for healthcare professionals caring for patients with Zika

- Links to materials from AAP, ACOG, CDC, and March of Dimes
- Contact information for the CDC Zika Pregnancy Hotline
- Planned expansion to additional jurisdictions in mid-2017
- Planned expansion to include laboratories that can test for Zika in mid-2017



HelpLine: 1-844-677-0447 (toll-free)

Website: www.zikacareconnect.org

ZIKAcareconnect

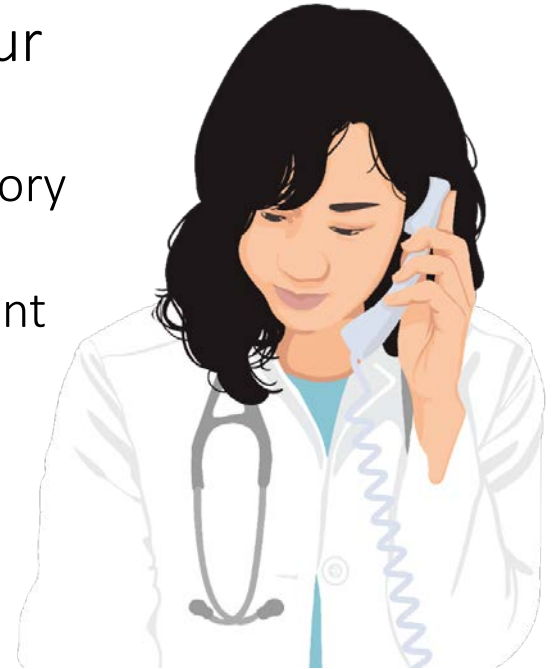
in collaboration with the **March of Dimes**



What Can You Do?

Report Cases

- Zika virus infection and disease are nationally notifiable conditions
- The following cases should be reported to your [state health department](#)
 - Symptomatic and asymptomatic cases with laboratory evidence of Zika virus infection
 - Babies born with or without abnormalities consistent with congenital Zika syndrome and laboratory evidence of Zika virus infection



Report Cases to US Zika Pregnancy Registry

- Healthcare providers are encouraged to report and actively monitor pregnancies and congenital outcomes among symptomatic and asymptomatic women with laboratory evidence of possible Zika virus infection
- **More information**
 - Available on the [US Zika Pregnancy Registry website](http://www.cdc.gov/zika/hc-providers/registry.html) (<http://www.cdc.gov/zika/hc-providers/registry.html>)
 - To contact CDC Registry staff, call the CDC Emergency Operations Center watch desk at 770-488-7100 and ask for the Zika Pregnancy Hotline or email ZIKApregnancy@cdc.gov
 - For non-urgent requests, call 800-CDC-INFO (800-232-4636)





In Summary

- Stay up to date on Zika virus and where it is being spread
- Know the basics about Zika virus transmission in your community
- Know the basics about Zika virus transmission in healthcare settings
- Provide support to diagnose and test for Zika virus for those with symptoms in your community
- Understand the assessment and management of Zika virus among pregnant women and infants and how to protect them from exposure
- Counsel couples on how to avoid Zika virus infection as they plan for pregnancy
- Support access to effective contraception for those not planning pregnancy
- Provide support for families of newborns affected by Zika virus
- Inform your local or state health department and the US Zika Pregnancy Registry as indicated

More Information about Zika Virus

More information on caring for pregnant women, infants, or children with Zika virus infection is available at [CDC's Zika Virus website](https://www.cdc.gov/zika/comm-resources/index.html).

The screenshot shows the CDC website interface. At the top left is the CDC logo with the text "Centers for Disease Control and Prevention" and "CDC 24/7: Saving Lives. Protecting People™". To the right is a search bar with the word "SEARCH" and a magnifying glass icon. Below the search bar is a "CDC A-Z INDEX" dropdown menu. The main navigation bar is dark blue with "Zika Virus" in white text. Below the navigation bar are social media icons for Facebook, Twitter, and a plus sign. To the right of the social media icons is a "Language: English" dropdown menu. The main content area features a large banner for "Zika Virus UPDATE" with a sub-headline "Zika Cases in Florida". The banner includes a map of the Americas and a mosquito. Below the banner are several navigation dots. To the right of the banner is a "At-A-Glance" section with two articles. The first article is titled "Pregnant Women with Any Lab Evidence of Zika Virus Infection*" and lists "US States and DC: 808" and "US Territories: 1,490". The second article is titled "Zika Virus Disease Cases Reported to ArboNET*" and lists "US States and DC: 3,625" and "US Territories: 22,069".

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People™

SEARCH

CDC A-Z INDEX

Zika Virus

f t +

Language: English

ZIKA VIRUS
UPDATE
Zika Cases in Florida

Zika Cases in Florida

At-A-Glance

[Pregnant Women with Any Lab Evidence of Zika Virus Infection*](#)

- US States and DC: 808
- US Territories: 1,490

*Source: Pregnancy Registries as of September 22, 2016

[More on Outcomes](#)

[Zika Virus Disease Cases Reported to ArboNET*](#)

- US States and DC: 3,625
- US Territories: 22,069

*Source: ArboNET as of September 28, 2016

www.cdc.gov/zika

<https://www.cdc.gov/zika/comm-resources/index.html>



Thank you!

More information on Zika: www.cdc.gov/zika

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

