

Update on Interim Zika Virus Clinical Guidance and Recommendations

**Clinician Outreach and Communication Activity
(COCA) Call
January 26, 2016**

TODAY'S PRESENTER



Emily Petersen, MD

Medical Officer

Division of Reproductive Health

National Center for Chronic Disease Prevention and Health Promotion

Centers for Disease Control and Prevention

TODAY'S PRESENTER



Katherine Fleming-Dutra, MD

Medical Epidemiologist

Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

TODAY'S PRESENTER



Alexa Oster, MD

Medical Epidemiologist

Division of HIV/AIDS Prevention

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

Centers for Disease Control and Prevention

Zika Virus

Update on Interim Zika Virus Clinical Guidance and Recommendations

Katherine Fleming-Dutra, MD
Medical Officer

Alexa Oster, MD
Medical Officer

Emily Petersen, MD
Medical Officer

February 25, 2016

What is Zika virus disease (Zika)?

- Disease spread primarily through the bite of an *Aedes* mosquito infected with Zika virus
 - Aggressive daytime biters, prefer to bite people, live indoors and outdoors
 - Can also bite at night
- Symptoms are mild and last for several days to a week



Aedes aegypti mosquito

Transmission of Zika virus

- Other modes of transmission
 - Intrauterine and perinatal transmission
 - Sexual transmission
 - Laboratory exposure
- Reported mode
 - Blood transfusion

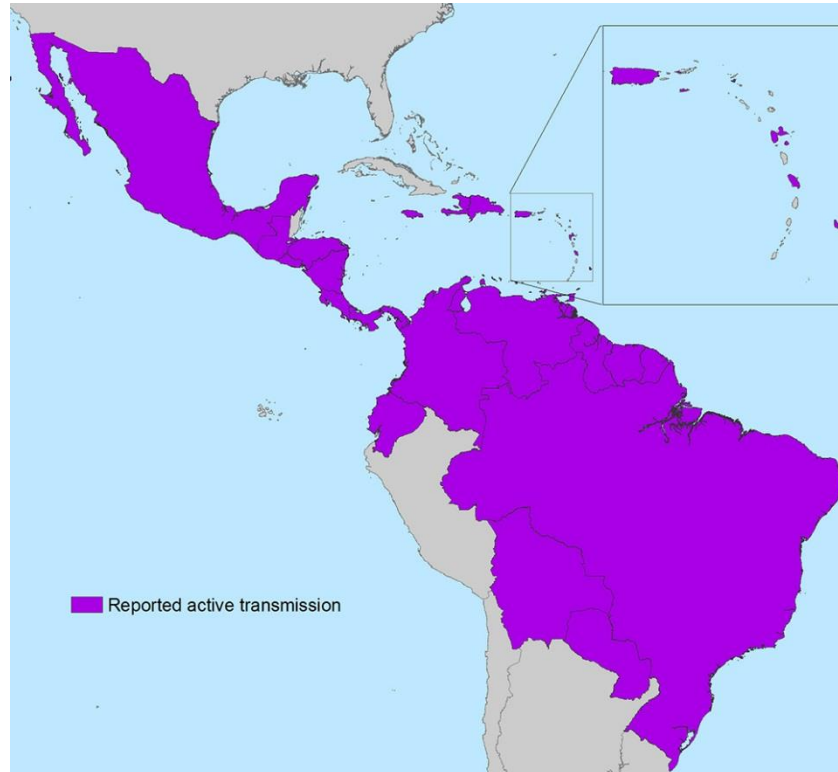
The Subcommittee on Arbovirus Laboratory Safety of the American Committee on Arthropod-Borne Viruses. Laboratory safety for arboviruses and certain other viruses of vertebrates. Am J Trop Med Hyg 1980;29:1359–81.

European Centre for Disease Prevention and Control. Rapid risk assessment: Zika virus epidemic in the Americas: potential association with microcephaly and Guillain-Barre syndrome. Stockholm, Sweden: European Centre for Disease Prevention and Control; 2015.

Symptoms

- Most common symptoms of Zika are
 - Fever
 - Rash
 - Joint pain
 - Conjunctivitis (red eyes)
- Other symptoms include
 - Muscle pain
 - Headache

Areas with Zika Virus: Countries & Territories in the Americas



as of February 23, 2016

<http://wwwnc.cdc.gov/travel/notices/>

Zika Virus in the United States

- Local vector-borne transmission of Zika virus has not been reported in the continental United States
- With current outbreak in the Americas, cases among U.S. travelers will likely increase
- Imported cases may result in virus introduction and local transmission in some areas of U.S.

Zika Virus in Pregnancy



- Limited information is available
- Existing data show:
 - No evidence of increased susceptibility
 - Infection can occur in any trimester
 - Incidence of Zika virus infection in pregnant women is not known
 - No evidence of more severe disease compared with non-pregnant people

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 and Microcephaly

- Brazil: >5200 cases of suspected microcephaly temporally linked with current Zika outbreak
- French Polynesia: 17 cases of neurologic malformations among fetuses and newborns that were temporally linked to 2013–2014 outbreak
- Investigations in Brazil and French Polynesia are ongoing

Victora CG, Schuler-Faccini L, Matijasevich A, Ribeiro E, Pessoa A, Barros FC. Microcephaly in Brazil: how to interpret reported numbers? Lancet 2016 Feb 13;387(10019):621-4.

European Centre for Disease Prevention and Control. Zika virus epidemic in the Americas: potential association with microcephaly and Guillain-Barre syndrome. 21 January 2016. Stockholm: ECDC; 2016.

Besnard M, Mallet H. Increase of cerebral congenital malformations among newborns and fetus in French Polynesia 2014-2015. 15 November 2015. Polynesie Francaise.

Microcephaly and Zika

What we know

- Small number of positive test results for Zika virus infection in infants with microcephaly
- Microcephaly pattern consistent with Fetal Brain Disruption Sequence
 - Based on photos/scans of a small number of affected infants from Brazil
 - Retrospective investigation in French Polynesia outbreak in 2013-2014
 - Infants with other intrauterine infections such as cytomegalovirus

What we don't know

- Causal relation between Zika virus and microcephaly or other adverse pregnancy outcomes
- Full spectrum of phenotypes in affected infants
- Impact of timing of infection during pregnancy
- Impact of severity of maternal infection
- Magnitude of the possible risk of microcephaly and other adverse pregnancy outcomes

Pregnancy Outcomes and Zika Virus

- Pregnant woman residing in Brazil
 - Symptoms of Zika virus disease at 18 weeks
- Ultrasound findings
 - 16 weeks: Normal
 - 21 weeks: Fetal microcephaly with moderate ventriculomegaly and partial agenesis of the cerebellar vermis
 - 27 weeks: Fetal microcephaly with ventricular dilation, asymmetry of hemispheres, hypoplastic cerebellum and absence of cerebellar vermis
 - 40 weeks: Fetal microcephaly with calcifications
- Testing
 - 28 weeks: Amniotic fluid positive for Zika virus RNA, serum and urine negative by Zika RT-PCR
- Delivery at 40 weeks
 - Infant born with head circumference <1st percentile

Pregnancy Outcomes and Zika Virus

- Pregnant woman residing in Brazil
 - Symptoms of Zika virus disease at 10 weeks
- Ultrasound findings
 - 22 weeks: Fetal mild hypoplasia of cerebellar vermis and head circumference <10th percentile
 - 25 weeks: Fetal microcephaly (head circumference <3rd percentile) with severe hypoplasia of cerebellar vermis, enlargement of posterior fossa, normal brain parenchyma
- Testing
 - 28 weeks: Amniotic fluid positive for Zika virus RNA; serum and urine negative by Zika RT-PCR
- Delivery
 - Infant born with severe ventriculomegaly, microphthalmia, cataracts and severe arthrogryposis

Pregnancy Outcomes and Zika Virus

- Pregnant woman residing in Brazil from preconception until 29 weeks of gestation
 - Symptoms of Zika virus disease at 13 weeks
- Ultrasound findings
 - 14 & 20 weeks: normal fetal growth & anatomy
 - 29 weeks: evidence of fetal anomalies
 - 32 weeks: intrauterine growth restriction, microcephaly, and other brain abnormalities
- Termination at 32 weeks
 - Brain weight 4 SD below normal
 - Zika virus RNA detected in fetal brain tissue
 - Almost complete agyria and internal hydrocephalus of lateral ventricles

Pregnancy Outcomes and Zika Virus

- Two pregnant women in Brazil had clinical signs of Zika virus disease during first trimester
- Infants born with microcephaly at 36 and 38 weeks gestation
 - Died within 20 hours of birth
- Zika virus RNA detected in brain tissue of both infants
- Significant histopathologic changes in the brain
 - Parenchymal calcification and necrosis

Pregnancy Outcomes and Zika Virus

- Two additional women in Brazil had clinical signs of Zika virus disease during the first trimester
 - Two fetal losses at 11 & 13 weeks gestation
- Zika virus RNA detected in products of conception
- Zika viral antigen detected by immunohistochemistry in one case
- Histopathologic changes in one case
 - Calcification and fibrosis in the chorionic villi

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

Speaker: Emily Petersen, MD

CDC Recommendations: Pregnant Women Considering Travel

- Pregnant women in any trimester should consider postponing travel to areas where Zika virus transmission is ongoing
- Pregnant women who are considering travel to one of these areas should talk to their healthcare provider and strictly follow steps to prevent mosquito bites during the trip

Zika Virus Disease Prevention: Pregnant Women

- CDC recommends taking the following measures to prevent mosquito bites:
 - Use EPA-registered insect repellent
 - EPA-registered repellents, including DEET and permethrin, are safe and effective for pregnant women
 - Wear long-sleeved shirts and pants to cover exposed skin
 - Wear permethrin-treated clothes
 - Stay and sleep in screened-in or air-conditioned rooms
 - Practice mosquito prevention strategies indoors and outdoors throughout the entire day

Evaluating Pregnant Travelers

- **Recommendations**

- Ask pregnant women about travel history.
- If history of travel to an area with ongoing Zika virus transmission during pregnancy, evaluate for symptoms of and test for Zika virus infection.
- Pregnant women with male partners who have Zika virus infection or potential Zika virus exposure should use condoms or abstain from sexual activity for the duration of pregnancy.

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

February 5, 2016

Update: Interim Guidelines for Health Care Providers Caring for Pregnant Women and Women of Reproductive Age with Possible Zika Virus Exposure — United States, 2016

Titilope Oduyebo, MD^{1,2}; Emily E. Petersen, MD²; Sonja A. Rasmussen, MD³; Paul S. Mead, MD⁴; Dana Meaney-Delman, MD⁵; Christina M. Renquist, MPH⁶; Sascha R. Ellington, MSPH²; Marc Fischer, MD⁴; J. Erin Staples, MD, PhD⁴; Ann M. Powers, PhD⁴; Julie Villanueva, PhD⁴; Romeo R. Galang, MD^{1,7}; Ada Dieke, DrPH^{1,2}; Jorge L. Muñoz, PhD⁴; Margaret A. Honein, PhD⁶; Denise J. Jamieson, MD²

On February 5, 2016 this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).

CDC has updated its interim guidelines for U.S. health care providers caring for pregnant women during a Zika virus outbreak (1). Updated guidelines include a new recommendation to offer serologic testing to asymptomatic pregnant women (women who do not report clinical illness consistent with

Evidence suggesting an association of Zika virus infection with an increased risk for congenital microcephaly and other abnormalities of the brain and eye (5) prompted the World Health Organization to declare the Zika virus outbreak a Public Health Emergency of International Concern on February 1, 2016 (<http://www.who.int/mediacentre/news/statements/2016/1st-emergency-committee-zika/en/>).

CDC Recommendations: Pregnant Women and Women of Reproductive Age With Possible Zika Virus Exposure

- Updated CDC guidance includes:
 - Serologic testing can be offered to asymptomatic pregnant women with travel history to areas with ongoing Zika virus transmission
 - Screening, testing, and management of pregnant women
 - Counseling of women of reproductive age (15–44 years)

Testing

CDC Recommendations: Diagnostic testing

- Reverse Transcription-Polymerase Chain Reaction (RT-PCR) for viral RNA in serum collected ≤ 7 days after illness onset
- Serology for Immunoglobulin M (IgM) in serum collected ≥ 4 days after illness onset
 - Cross-reactivity can occur among related flaviviruses
 - Plaque Reduction Neutralization Test (PRNT) can be performed to measure virus-specific neutralizing antibodies

CDC Recommendations:

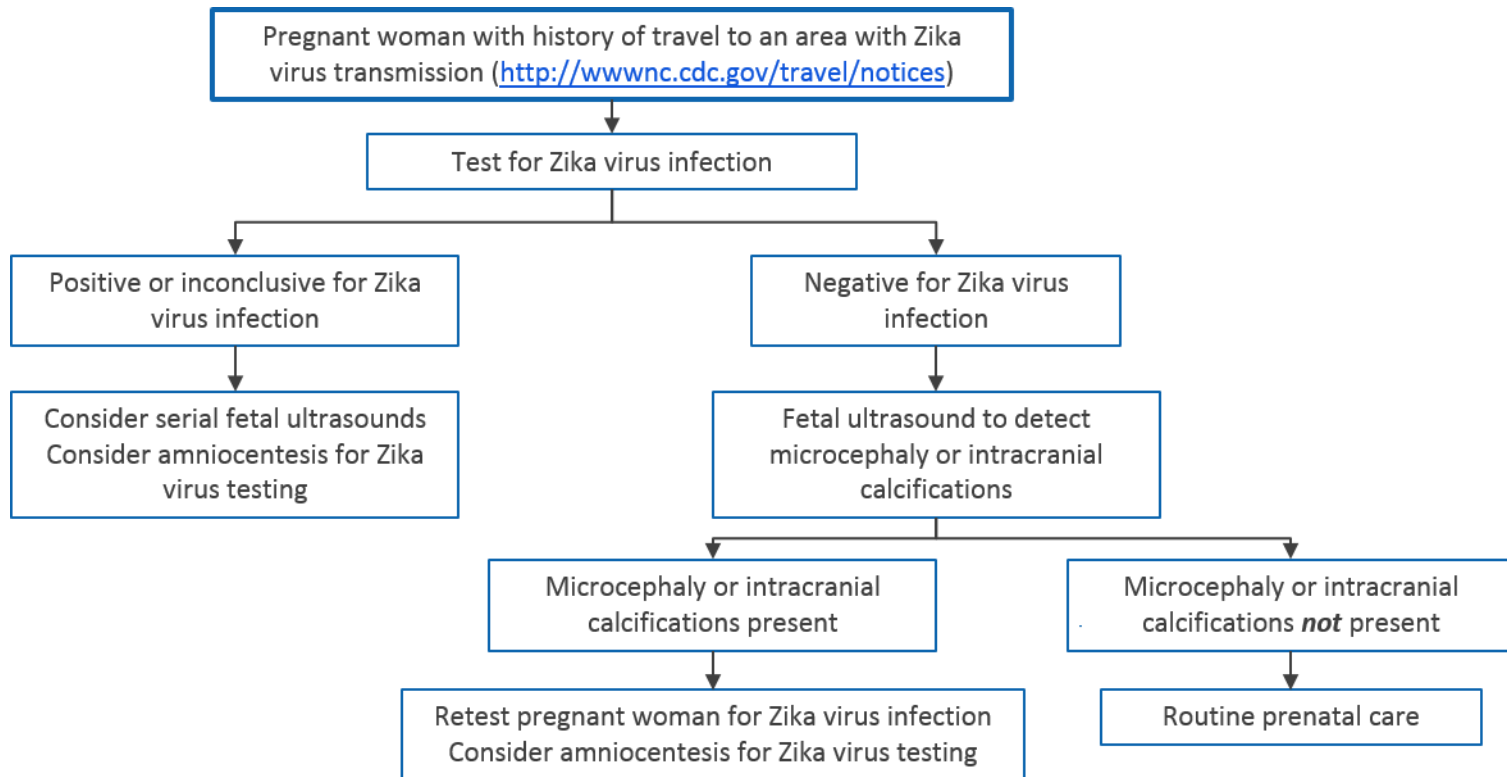
Testing for Asymptomatic Pregnant Women with Possible Zika Virus Exposure

- Serologic (IgM) testing can be offered to asymptomatic pregnant women
- Negative IgM result could suggest a recent infection did not occur and obviate need for serial ultrasounds
- Information about performance of testing of asymptomatic persons limited

Testing Algorithm for Pregnant Women with History of Travel to Areas with Ongoing Zika Virus Transmission

Interim Guidelines:

Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission



Interim Guidelines:

Symptomatic Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission

Pregnant woman with history of travel to an area with Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices>).

Test for Zika virus infection

Test pregnant women with two or more of the following symptoms within 2 weeks of travel:

- Acute onset of fever
- Maculopapular rash
- Arthralgia
- Conjunctivitis

RT-PCR test should be performed during the first week of clinical illness.

IgM may also be indicated depending on timing.

Testing should be coordinated through state, local, or territorial health department.

Interim Guidelines:

Asymptomatic Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission

Pregnant woman with history of travel to an area with Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices>).



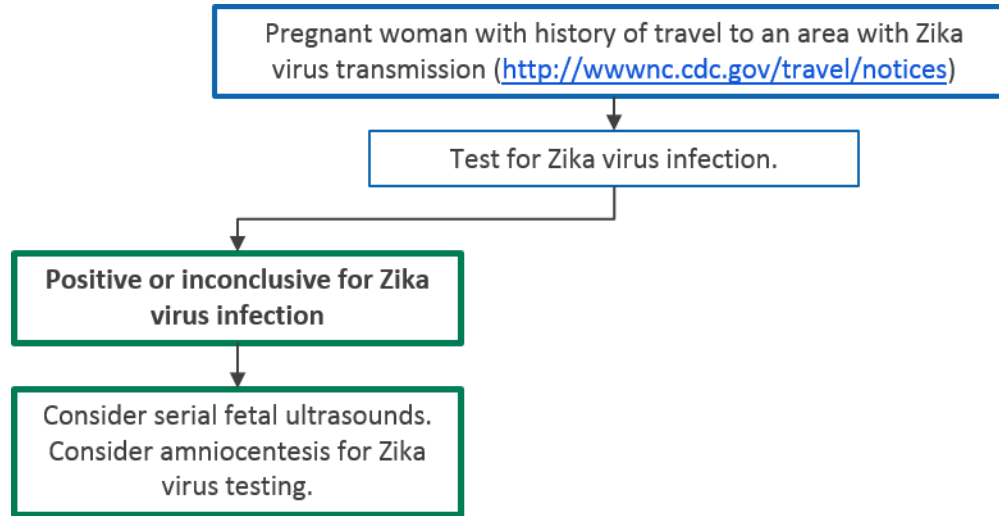
Test for Zika virus infection

Serologic (IgM) testing can be offered.

Testing should be coordinated through state, local, or territorial health department.

Interim Guidelines:

Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission



Positive test

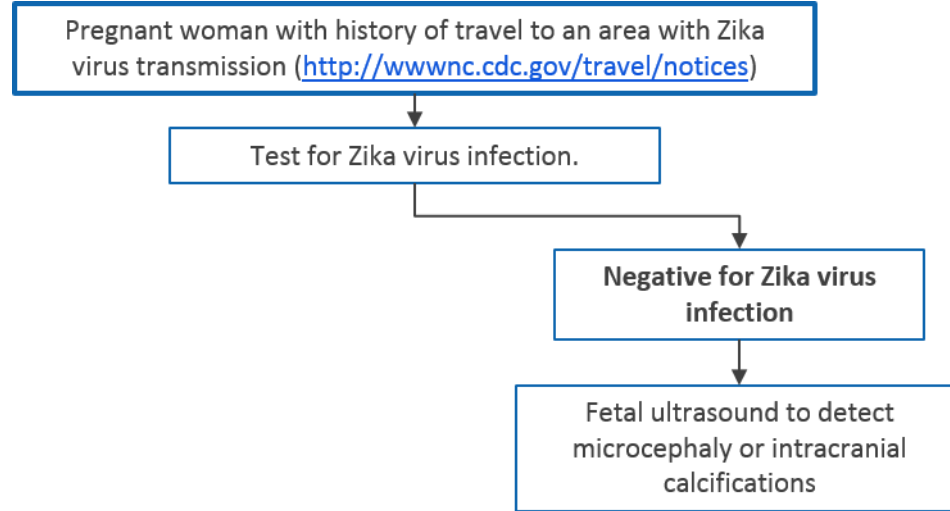
- Zika virus RT-PCR
- Zika virus IgM positive with confirmatory neutralizing antibody titers that are ≥ 4 -fold higher than dengue virus neutralizing antibody titers in serum

Inconclusive test

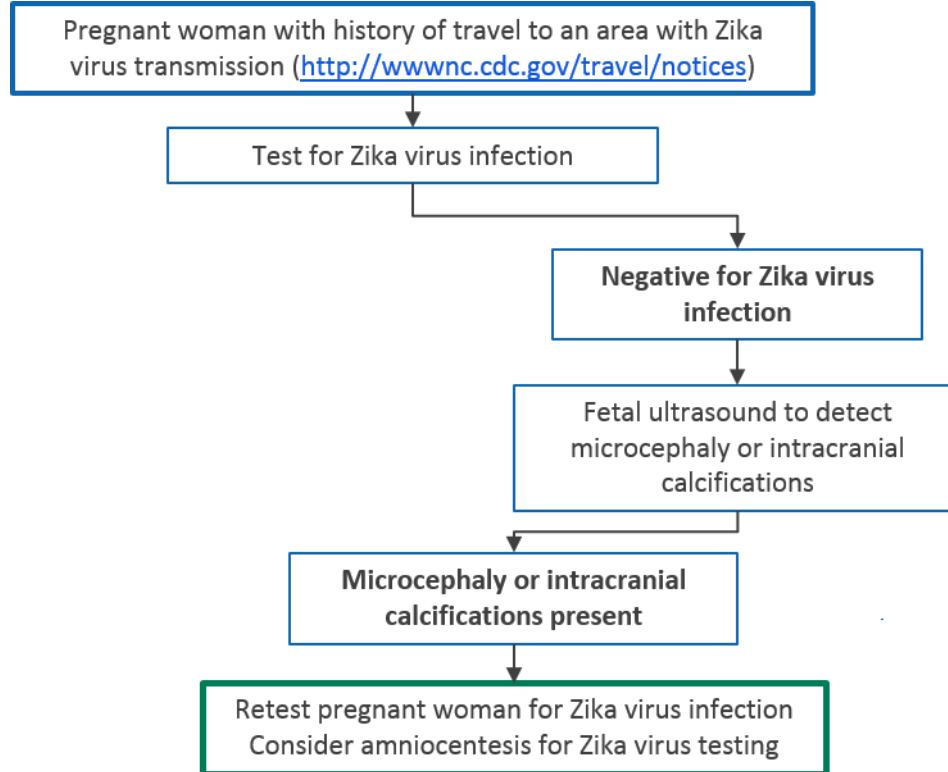
Zika virus IgM positive with neutralizing antibody titers that are < 4 -fold higher than dengue virus neutralizing antibody titers.

Interpretation of testing should be coordinated through state, local, or territorial health departments.

Interim Guidelines: Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission



Interim Guidelines: Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission

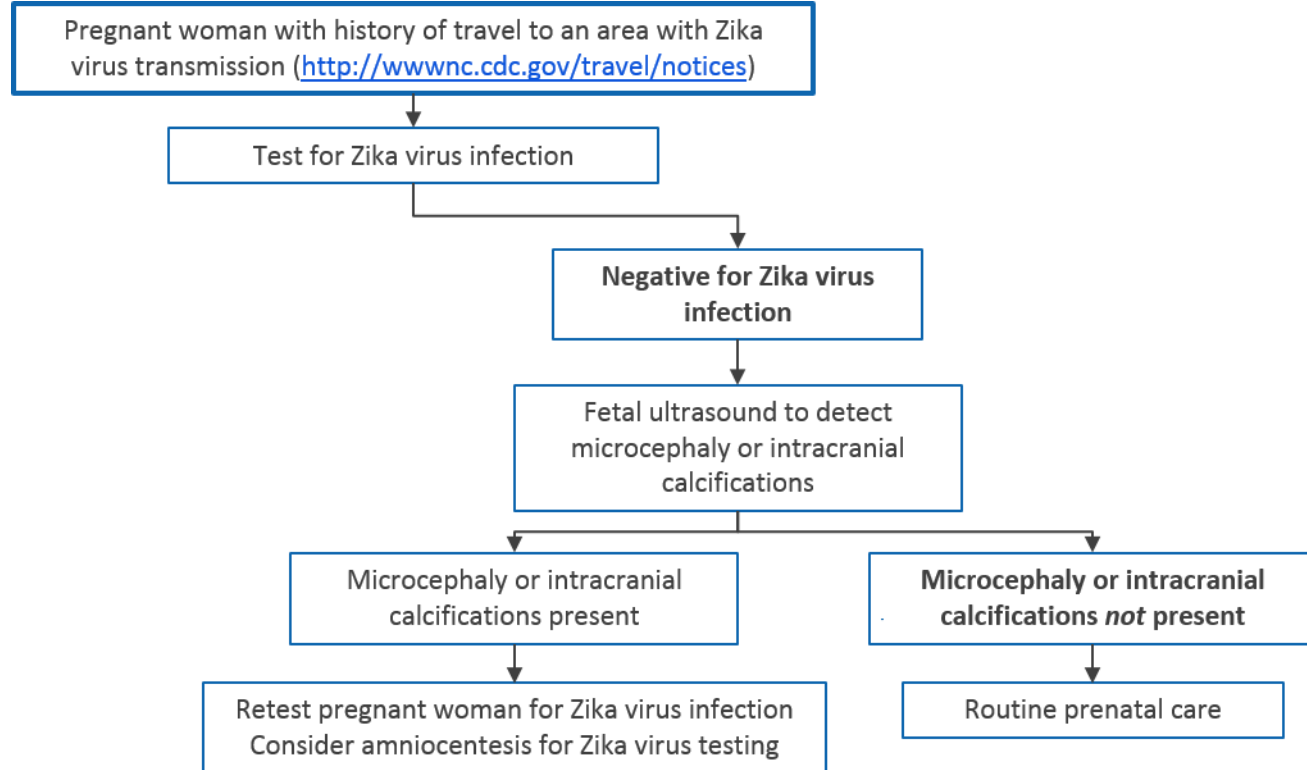


Serologic (IgM) testing should be performed.

RT-PCR on amniotic fluid.

Interim Guidelines:

Pregnant Women With History Of Travel To Areas With Ongoing Zika Virus Transmission



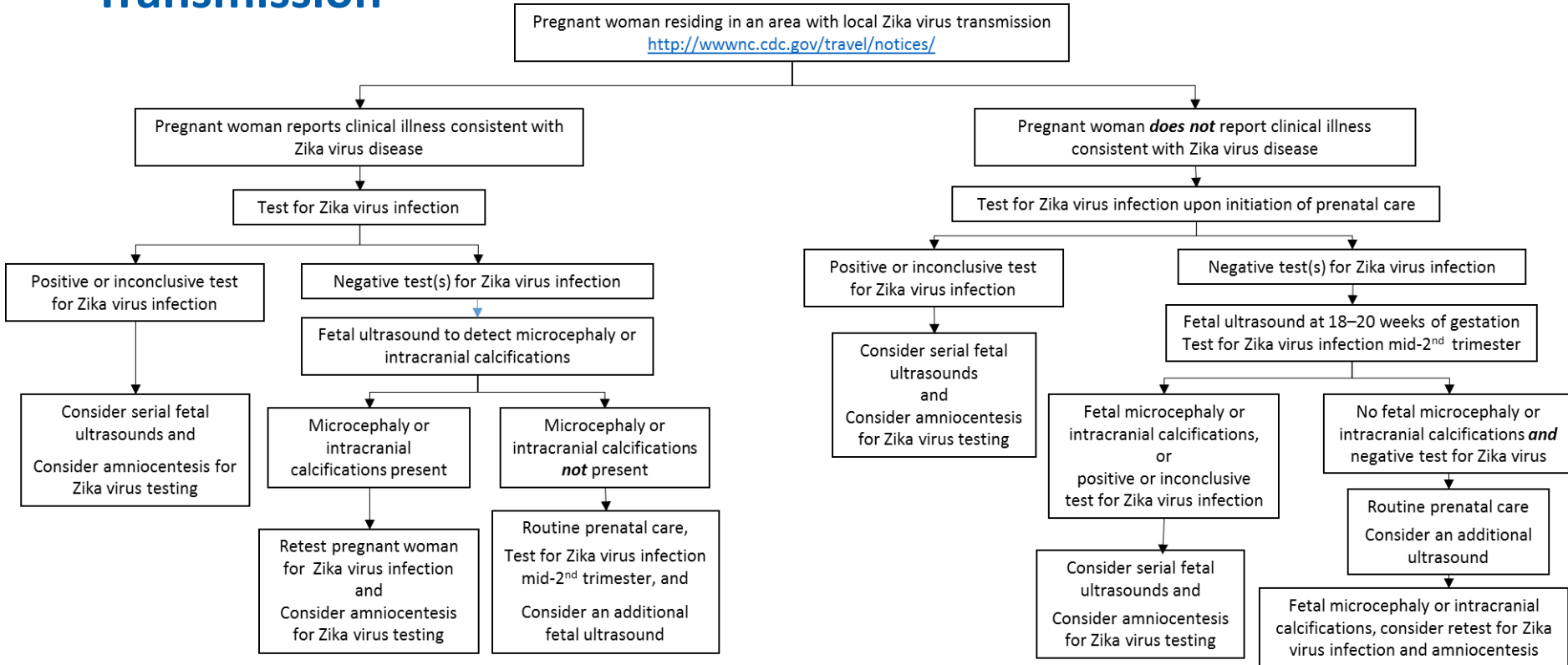
Testing Algorithm for Pregnant Women Residing in Areas with Ongoing Zika Virus Transmission

Areas With Ongoing Zika Virus Transmission: **Evaluating Pregnant Residents**

- Healthcare providers should
 - Evaluate for symptoms of Zika virus infection
 - Perform appropriate testing according to algorithm
- Recommendations
 - Offer serologic testing at
 - Initiation of prenatal care
 - Follow up mid-2nd trimester
 - Routine ultrasound screening recommended for all pregnant women at 18–20 weeks of gestation
 - Pregnant women with male partners who have or are at risk of Zika virus infection should use condoms or abstain from sexual activity for the duration of pregnancy

Interim Guidelines:

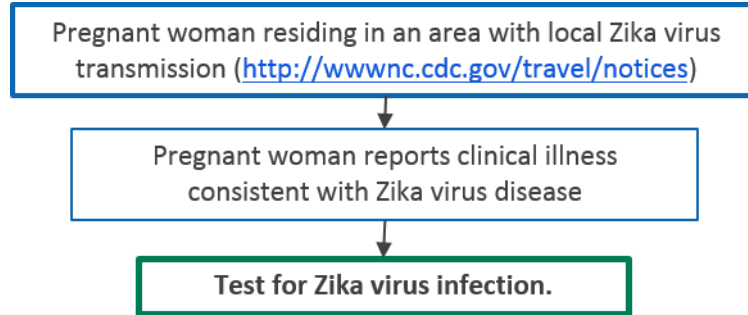
Pregnant Women Residing in Areas with Ongoing Zika Virus Transmission



Symptomatic Pregnant Women Residing in
Areas with Ongoing Zika Virus
Transmission

Interim Guidelines:

Symptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Test pregnant women with two or more of the following symptoms:

- Acute onset of fever
- Maculopapular rash
- Arthralgia
- Conjunctivitis

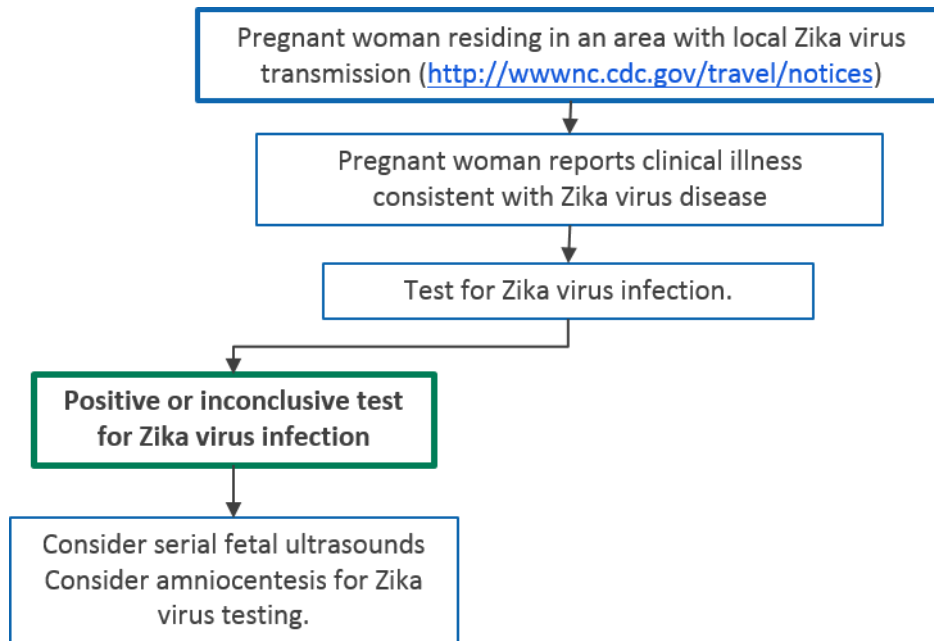
RT-PCR test should be performed during the first week of clinical illness.

IgM may also be indicated depending on timing.

Testing should be coordinated through state, local, or territorial health department.

Interim Guidelines:

Symptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Positive test

- Zika virus RT-PCR
- Zika virus IgM positive with confirmatory neutralizing antibody titers that are ≥ 4 -fold higher than dengue virus neutralizing antibody titers in serum.

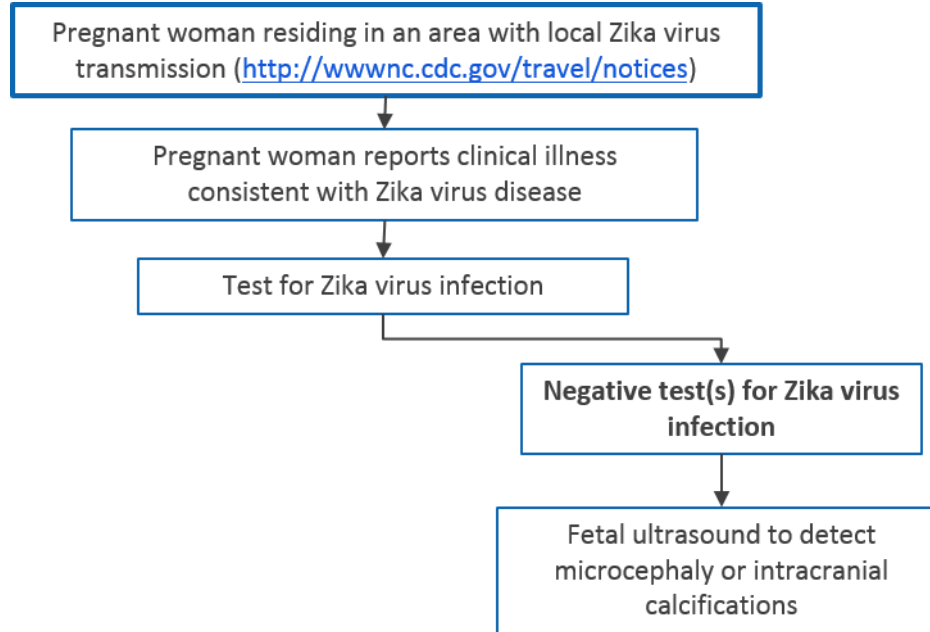
Inconclusive test

Zika virus IgM positive with neutralizing antibody titers that are < 4 -fold higher than dengue virus neutralizing antibody titers.

Interpretation of testing should be coordinated through state or local health department.

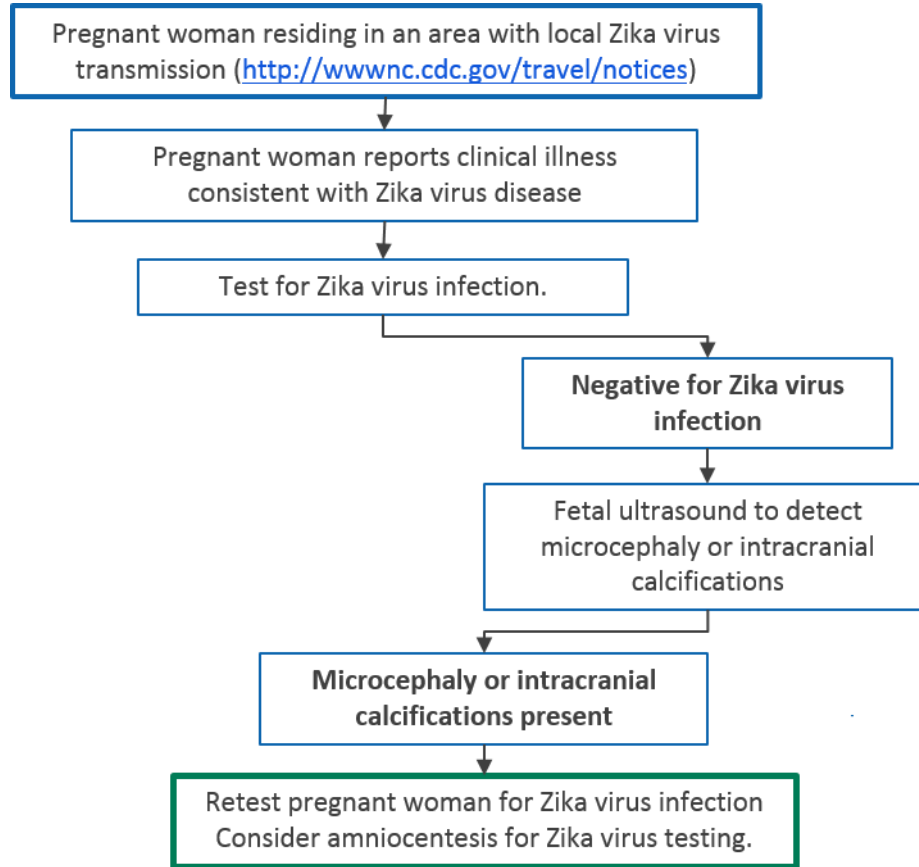
Interim Guidelines:

Symptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Interim Guidelines:

Symptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission

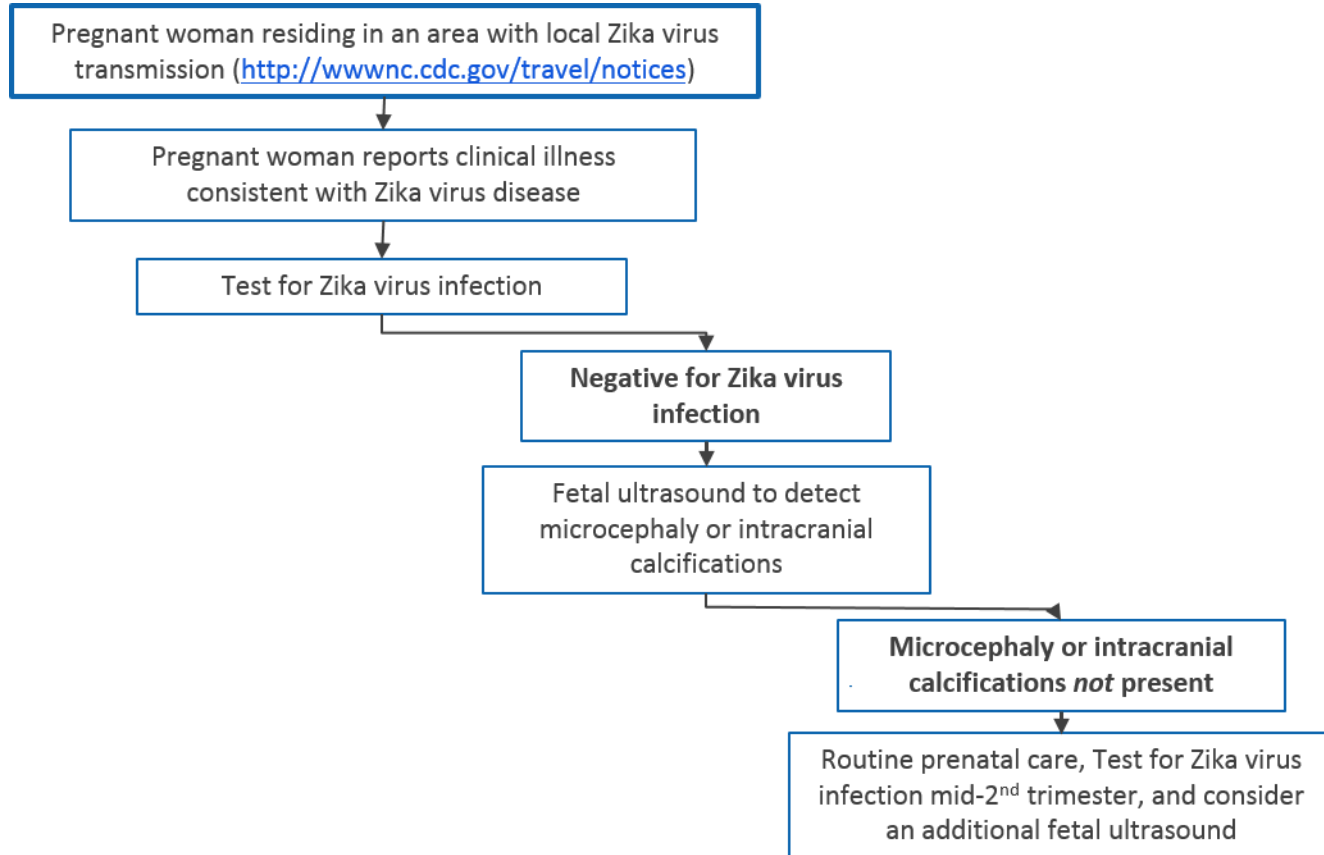


Serologic (IgM) testing should be performed.

RT-PCR on amniotic fluid.

Interim Guidelines:

Symptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Serologic (IgM) testing should be performed.

**Asymptomatic Pregnant Women Residing
in Areas with Ongoing Zika Virus
Transmission**

Interim Guidelines:

Asymptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission

Pregnant woman residing in an area with local Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices>)

Pregnant woman does NOT report clinical illness consistent with Zika virus disease

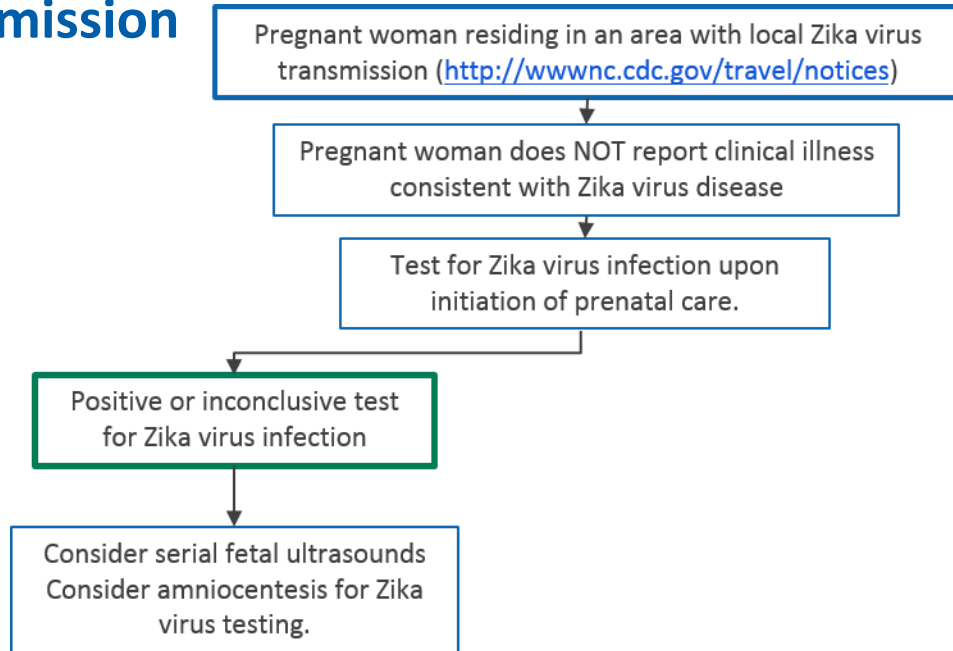
Test for Zika virus infection upon initiation of prenatal care.

Serologic (IgM) testing can be performed.

Local health officials should determine when to implement testing of asymptomatic pregnant women based on information about levels of Zika virus transmission and laboratory capacity.

Interim Guidelines:

Asymptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Positive test

Zika virus IgM positive with confirmatory neutralizing antibody titers that are ≥ 4 -fold higher than dengue virus neutralizing antibody titers in serum.

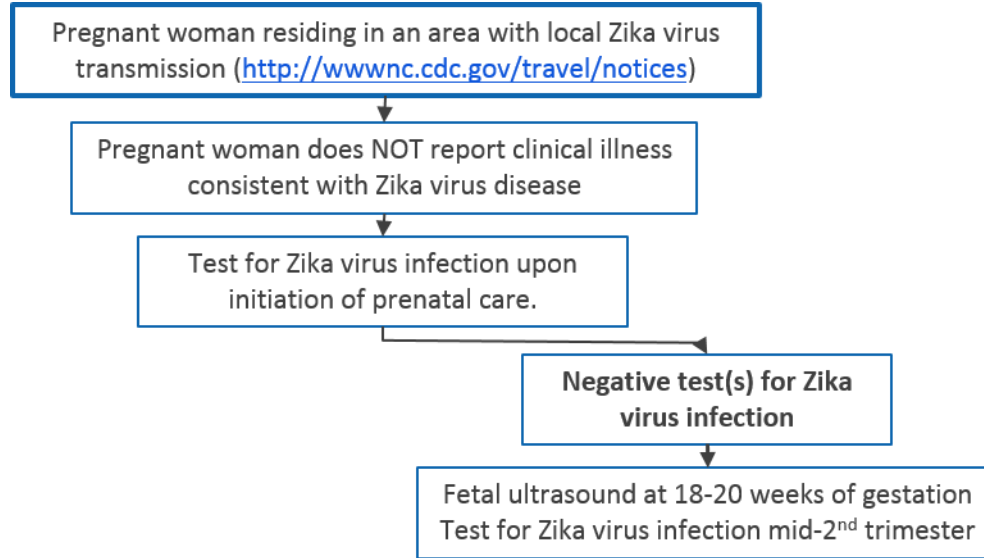
Inconclusive test

Zika virus IgM positive with confirmatory neutralizing antibody titers that are < 4 -fold higher than dengue virus neutralizing antibody titers.

Interpretation of testing should be coordinated through state or local health departments.

Interim Guidelines:

Asymptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission



Serologic (IgM) testing should be performed.

Interim Guidelines:

Asymptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission

Pregnant woman residing in an area with local Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices>)

Pregnant woman does NOT report clinical illness consistent with Zika virus disease

Test for Zika virus infection upon initiation of prenatal care.

Negative test(s) for Zika virus infection

Fetal ultrasound at 18-20 weeks of gestation
Test for Zika virus infection mid-2nd trimester.

**Microcephaly or intracranial calcifications present or
Positive or inconclusive test for Zika virus infection**

Consider serial fetal ultrasound
Consider amniocentesis for Zika virus testing.

RT-PCR on
amniotic fluid.

Interim Guidelines:

Asymptomatic Pregnant Women Residing in Areas With Ongoing Zika Virus Transmission

Pregnant woman residing in an area with local Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices>)

Pregnant woman does NOT report clinical illness consistent with Zika virus disease.

Test for Zika virus infection upon initiation of prenatal care.

Negative test(s) for Zika virus infection

Fetal ultrasound at 18-20 weeks of gestation
Test for Zika virus infection mid-2nd trimester

No fetal microcephaly or intracranial calcifications
and negative test for Zika virus

Routine prenatal care
Consider additional ultrasound.

Fetal microcephaly or intracranial calcifications, consider retest for Zika virus infection and amniocentesis

Serologic (IgM) testing should be performed.

RT-PCR on amniotic fluid.

Zika Virus Infection and Pregnancy: Clinical Management

Zika Virus Infection and Pregnancy: Clinical Management

- Positive or inconclusive Zika virus testing results
 - Antepartum
 - Consider serial ultrasounds every 3–4 weeks
 - Referral to maternal-fetal medicine specialist is recommended
 - Postpartum
 - Histopathologic examination of the placenta and umbilical cord
 - Testing of frozen placental tissue and cord tissue for Zika virus RNA
 - Testing of cord serum for Zika and dengue virus IgM and neutralizing antibodies

**Women of Reproductive Age Residing in
Areas with Ongoing Zika Virus
Transmission**

Special Considerations: Women of Reproductive Age Residing in Areas of Ongoing Zika Virus Transmission

- Providers should counsel women regarding
 - Mosquito bite prevention
 - Reproductive life plan and preconception care
 - Reproductive health history, values, and preferences
 - Zika virus
 - Signs and symptoms of Zika virus disease and when to seek care
 - Potential risks of Zika virus infection during pregnancy

Special Considerations: Women of Reproductive Age Residing in Areas of Ongoing Zika Virus Transmission

- *For women who do not desire pregnancy, provide counseling on*
 - Correct and consistent use of effective contraception
 - Condoms to reduce risk of contracting sexually transmitted infections

Special Considerations: Women of Reproductive Age Residing in Areas of Ongoing Zika Virus Transmission

- *For women who desire pregnancy*
 - Emphasize mosquito prevention
 - Provide preconception counseling
 - Review risks of Zika virus disease transmission during pregnancy
 - Refer to updates at <http://www.cdc.gov/zika/>
 - If prior Zika virus infection
 - Inform patients there is no evidence Zika virus poses risk of birth defects for future pregnancies

Update: Interim Guidelines for Healthcare Providers Caring for Infants and Children with Possible Zika Virus Infection — United States, February 2016

Speaker: Katherine Fleming-Dutra, MD

Acute Zika Virus Disease in Infants and Children

Perinatal Transmission of Zika Virus

- Evidence of perinatal infection (near time of delivery)
 - Zika virus outbreak in French Polynesia 2013–2014
 - Two pregnant women with signs and symptoms consistent with Zika virus infection around the time of delivery
 - Zika virus RNA detected by RT-PCR in both mothers
 - Zika virus infection was confirmed in the neonates, 1–3 days after delivery
 - Unlikely that neonates were exposed to mosquitoes
 - Babies recovered but long-term follow up not reported

Clinical Manifestations of Zika Virus in Children

- Most children asymptomatic or have mild illness
- Zika virus outbreak in Yap Island, Micronesia, 2007
 - Illness reported in persons 1-76 years of age
 - Most common signs and symptoms: rash (macular or papular), fever, arthralgia, conjunctivitis
 - Children 0-19 years had lower attack rates than adults 20-59 years
- Among 8 travel-related cases of Zika virus disease in children in US
 - All had rash and at least one additional manifestation (fever, arthralgia, and nonpurulent conjunctivitis)

Complications of Zika Virus

- Guillain-Barré syndrome (GBS) has been reported after Zika virus infection, but causal link has not been established
 - Unclear how many children have had GBS after Zika virus infection
 - Brazil: 6 patients aged 2-57 years with neurologic syndromes (GBS and Acute Disseminated Encephalomyelitis) after Zika infection
 - French Polynesia: 38 cases of GBS, none among children
 - Overall, GBS incidence appears to increase with increasing age
- Deaths associated with Zika are very rare

Centers for Disease Control and Prevention
MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

February 19, 2016

Update: Interim Guidelines for Health Care Providers Caring for Infants and Children with Possible Zika Virus Infection — United States, February 2016

Katherine E. Fleming-Dutra, MD¹; Jennifer M. Nelson, MD^{2,3}; Marc Fischer, MD⁴; J. Erin Staples, MD, PhD⁴; Mateusz P. Karwowski, MD^{2,5}; Paul Mead, MD⁴; Julie Villanueva, PhD⁶; Christina M. Renquist, MPH⁷; Anna A. Minta, MD^{2,8}; Denise J. Jamieson, MD⁹; Margaret A. Honein, PhD⁷; Cynthia A. Moore, MD, PhD⁷; Sonja A. Rasmussen, MD¹⁰

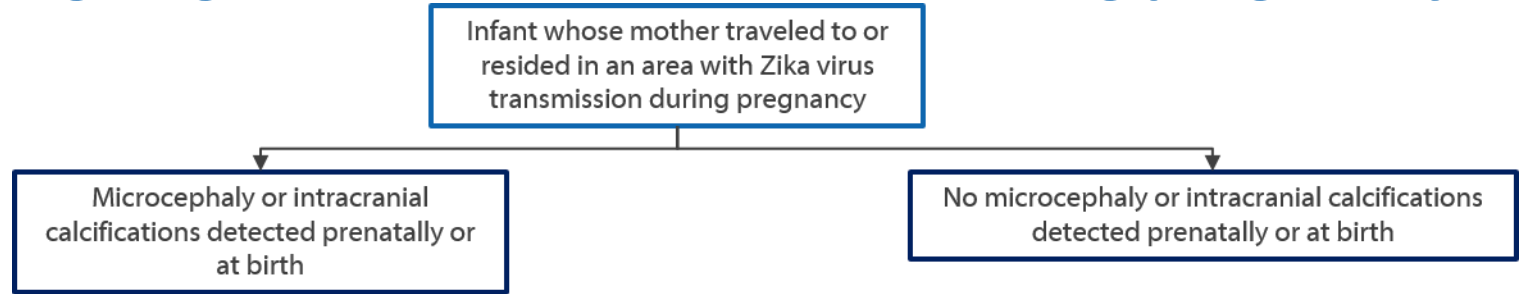
CDC has updated its interim guidelines for U.S. health care providers caring for infants born to mothers who traveled to or resided in areas with Zika virus transmission during pregnancy and expanded guidelines to include infants and children with

Americas as of February 17, 2016 (<http://www.cdc.gov/zika/geo/active-countries.html>). In October 2015, a marked increase in the number of infants with microcephaly was reported in Brazil (5). Because of the temporal and geographic occurrence of Zika

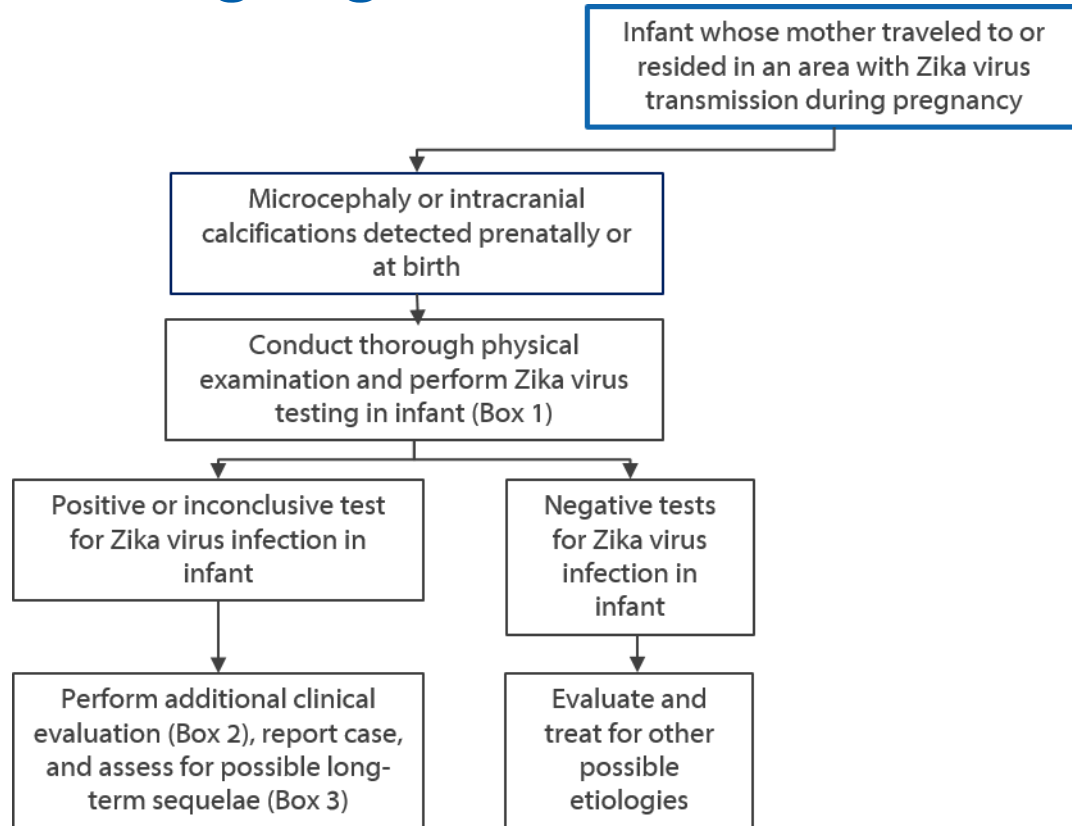
Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy

Infant whose mother traveled to or resided in an area with Zika virus transmission during pregnancy

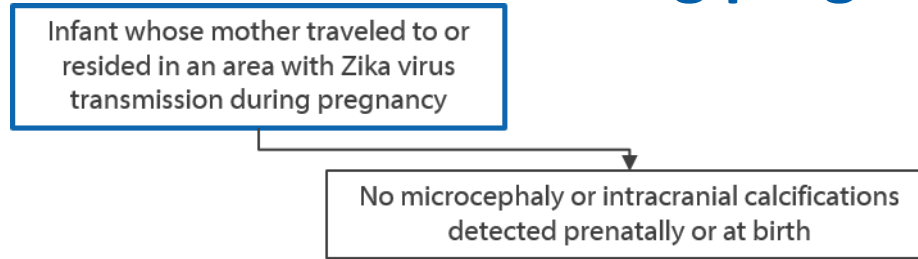
Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



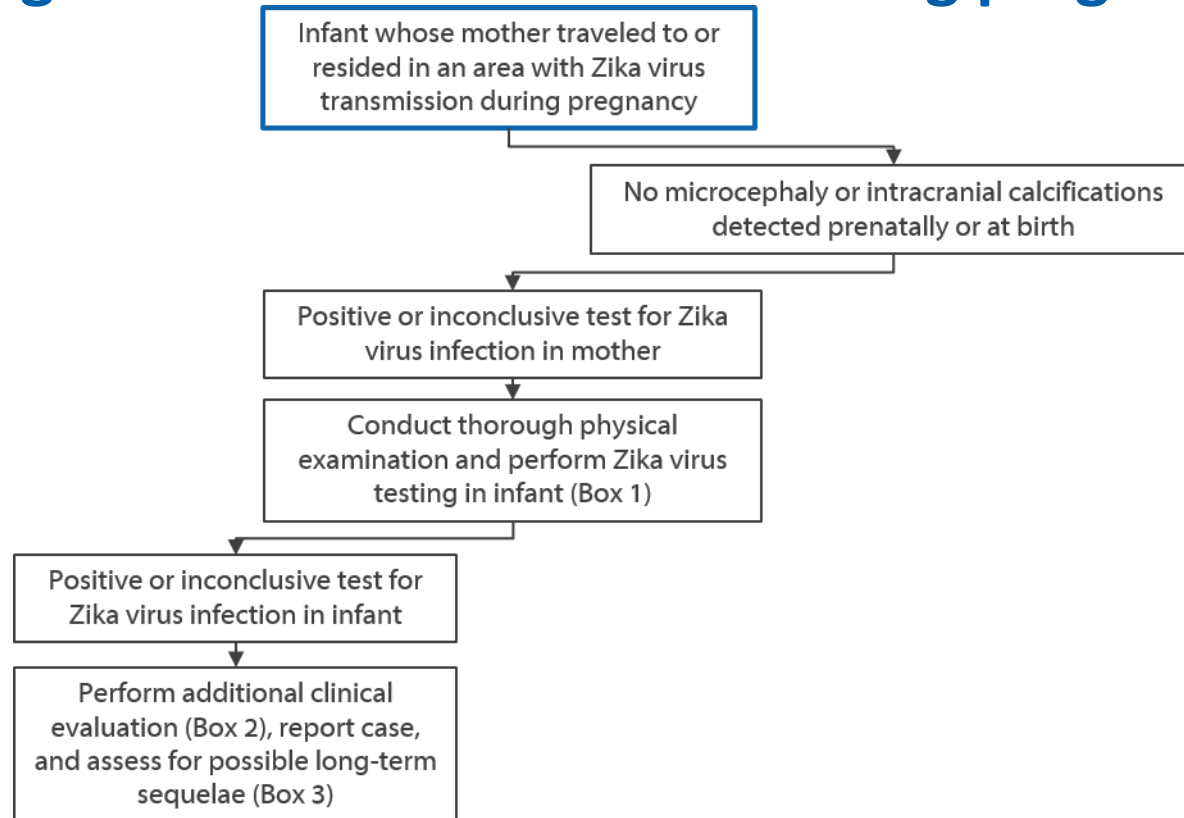
Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



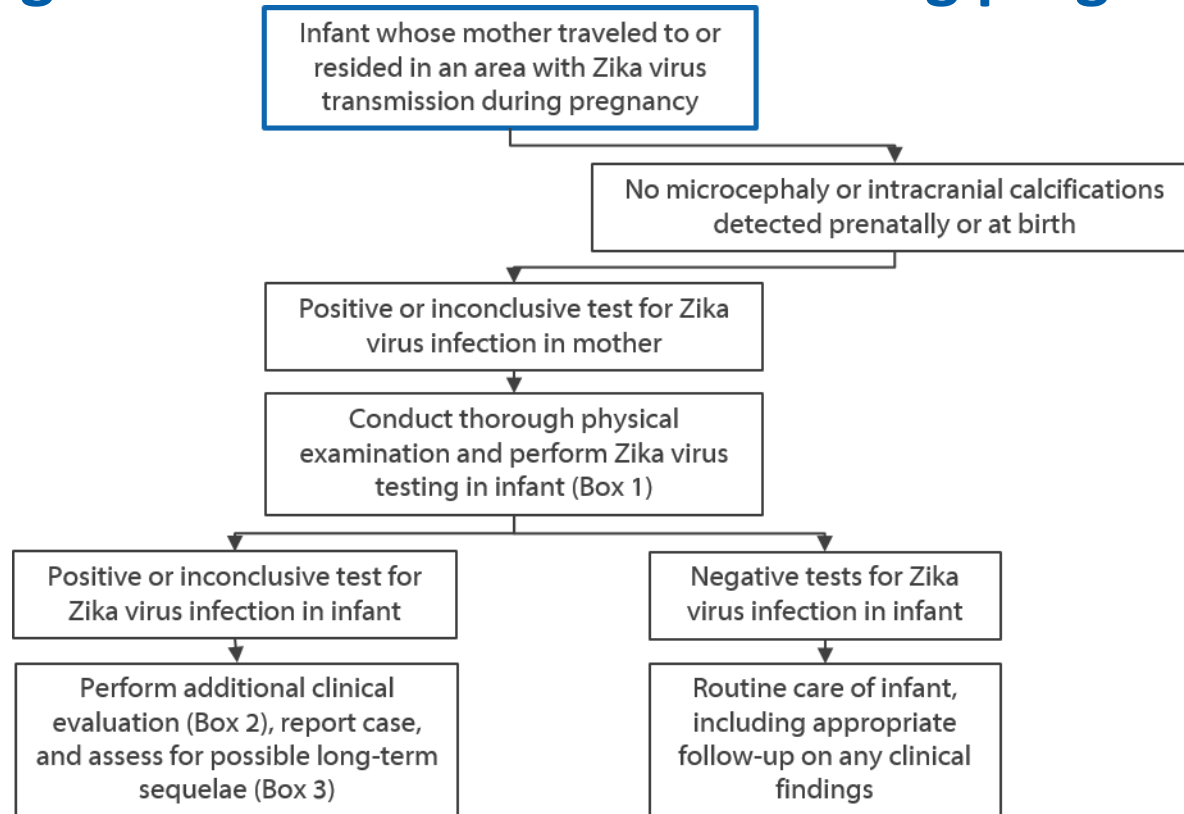
Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



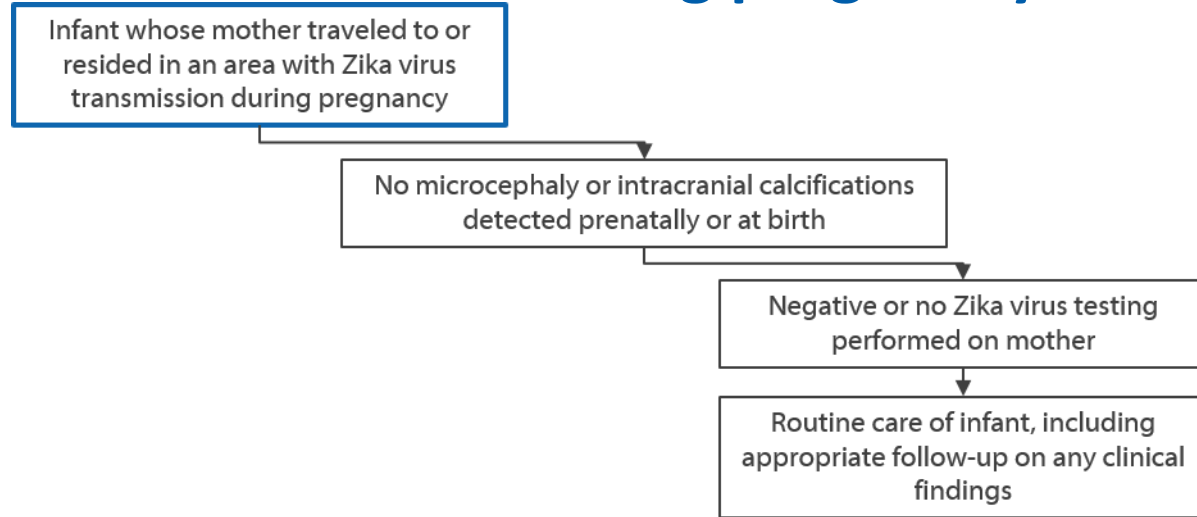
Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



Infants whose mothers traveled to or resided in an area with ongoing Zika virus transmission during pregnancy



Infants without microcephaly or intracranial calcifications whose mothers traveled to or resided in areas with ongoing Zika transmission during pregnancy but were not tested

- If infant has normal head circumference, prenatal ultrasounds, postnatal ultrasounds (if performed), physical examination → routine care
- Use clinical judgment if an infant has abnormalities other than microcephaly or intracranial calcifications
 - Consider testing mother before infant

Zika Virus Testing of Infants

- Recommended for
 - Infants with microcephaly or intracranial calcifications born to women who traveled to or resided in an area with Zika virus transmission while pregnant
 - Infants born to mothers with positive or inconclusive test results for Zika virus infection

**Evaluation of Infants and
Children (Age <18 Years)
with Possible Acute Zika Virus Disease**

Evaluation and Management of Infants and Children Aged <18 Years with Possible Acute Zika Virus Disease

- Infants and children aged < 18 years
 - Traveled to or resided in an affected area within the past 2 weeks
AND
 - Have at least 2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia

Evaluation and Management of Infants and Children Aged <18 Years with Possible Acute Zika Virus Disease

- Infants in the first 2 weeks of life
 - Mother traveled to or resided in an affected area within 2 weeks of delivery
 - AND
 - Have ≥ 2 of the following manifestations: fever, rash, conjunctivitis, or arthralgia
- Infants whose mothers report illness consistent with Zika virus disease near the time of delivery should be monitored carefully

Special Consideration

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

Recommended Testing for Acute Zika Virus Disease

- Test serum and, if obtained for other reasons, cerebrospinal fluid
 - If symptoms present for <7 days
 - Zika virus RNA by RT-PCR
 - If Zika virus RNA is not detected and symptoms have been present for ≥4 days
 - Zika and dengue virus IgM and neutralizing antibodies
- More information about laboratory testing can be found at:
<http://www.cdc.gov/zika/state-labs/index.html>

Laboratory Evidence of Zika Virus Infection

- Positive test results
 - In any clinical sample
 - Zika virus by culture, RNA by RT-PCR, or antigen
 - Zika virus IgM with confirmatory neutralizing antibodies ≥ 4 -fold higher than dengue virus neutralizing antibodies
- Inconclusive result
 - Zika virus neutralizing antibodies < 4 fold higher than dengue

Clinical Management

- No specific antiviral treatment
- Supportive care
- Avoid nonsteroidal anti-inflammatory drugs (NSAIDs) until dengue virus ruled out and in children <6 months
- Avoid aspirin in children with suspected viral infection due to the association with Reye's syndrome

Guidelines for Breastfeeding for Mothers with Zika Virus Infection and Living in Areas with Zika virus

- Zika virus RNA has been identified in breast milk
- Zika virus has not been cultured from breast milk
- No cases of Zika transmission associated with breastfeeding have been reported
- Mothers are encouraged to breastfeed their infants
- Current evidence: benefits of breastfeeding outweigh theoretical risks

Prevention of Zika Virus in Infants and Children

- Mosquito prevention
 - Air conditioning or window and door screens when indoors
 - Long-sleeves and long pants
 - Use permethrin-treated clothing and gear
 - When use as directed on the product label, most EPA*-registered insect repellants can be used in children ≥ 2 months
 - Oil of lemon eucalyptus should not be used in children < 3 years old
 - Mosquito netting for carriers, strollers, or cribs for infants

*EPA= Environmental Protection Agency

Nasci, RS et al. Protection against Mosquitoes, Ticks, & Other Arthropods in Chapter 2: The Pre-Travel Consultation: Counseling & Advice for Travelers

<http://wwwnc.cdc.gov/travel/yellowbook/2016/the-pre-travel-consultation/protection-against-mosquitoes-ticks-other-arthropods>

Prevention of Zika Virus Infection in Infants and Children

- Healthcare providers should educate parents and caregivers about mosquito bite prevention in infants and children if they are traveling to or residing in areas affected by Zika virus
- Parents should protect infants and children with Zika virus from mosquito bites for at least one week to decrease risk of transmission to others

Update: Interim Guidelines for Prevention of Sexual Transmission of Zika Virus – United States, 2016

Speaker: Alexa Oster, MD

Centers for Disease Control and Prevention
MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

February 5, 2016

Interim Guidelines for Prevention of Sexual Transmission of Zika Virus — United States, 2016

Alexandra M. Oster, MD¹; John T. Brooks, MD¹; Jo Ellen Stryker, PhD¹; Rachel E. Kachur², MPH; Paul Mead, MD³; Nicki T. Pesik, MD⁴; Lyle R. Petersen, MD³

Zika virus is a mosquito-borne flavivirus primarily transmitted by *Aedes aegypti* mosquitoes (1,2). Infection with Zika virus is asymptomatic in an estimated 80% of cases (2,3), and when Zika virus does cause illness, symptoms are generally mild and self-limited. Recent evidence suggests a possible association between

The following recommendations, which apply to men who reside in or have traveled to areas with active Zika virus transmission (<http://wwwnc.cdc.gov/travel/notices/>) and their sex partners, will be revised as more information becomes available.

Sexual Transmission of Zika Virus:

What We Know and What We Do Not Know

What we know:

- Zika virus can be sexually transmitted by a man to his sex partners, and this is of particular concern during pregnancy.
 - All reported cases of sexual transmission involved sex without a condom with men who had or developed symptoms.
- Sexual transmission of many infections, including those caused by other viruses, is reduced by consistent and correct use of latex condoms.

What we do not know:

- Whether infected men who never develop symptoms can transmit Zika virus to their sex partners.
- How long Zika virus persists in the semen.
 - One report found the virus in semen at least two weeks after symptoms of infection began.
 - Another report found the virus in semen at least 62 days after symptoms of infection began.
- Whether women with Zika infection can transmit Zika virus to their sex partners.
- Whether Zika can be transmitted from oral sex.
 - It is known that Zika is infectious in semen.
 - It is unknown if Zika is infectious in other body fluids exchanged by oral sex, including saliva and vaginal fluids.

Sexual Transmission of Zika Virus: CDC Recommendations for Men Who Live in or Traveled to an Area of Active Zika Virus Transmission

Men and their pregnant sex partners:

- Should abstain from sexual activity or consistently and correctly use condoms during sex (i.e., vaginal intercourse, anal intercourse, or fellatio) for the duration of the pregnancy.
- Pregnant women should discuss their male partner's potential exposures to mosquitoes and history of Zika-like illness with their healthcare provider; providers can consult CDC's guidelines for evaluation and testing of pregnant women.

Men and their nonpregnant sex partners:

- If concerned about sexual transmission of Zika virus, might consider abstaining from sexual activity or using condoms consistently and correctly during sex. Couples should take several factors into account:
 - Most infections are asymptomatic, and when illness does occur, it is usually mild.
 - Severe disease requiring hospitalization is uncommon.
 - Risk for acquiring vector-borne Zika virus in areas of active transmission depends on the duration and extent of exposure to infected mosquitoes and the steps taken to prevent mosquito bites.
 - After infection, Zika virus might persist in semen when it is no longer detectable in blood.
- At this time, testing of men for the purpose of assessing risk for sexual transmission is not recommended.

Thanks to our many collaborators and partners!

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.



Selected References

- Besnard M, et al. Evidence of perinatal transmission of Zika virus, French Polynesia, December 2013 and February 2014 . Euro Surveill 2014;19(13):20751.
- Duffy MR, et al. Zika virus outbreak on Yap Island, Federated States of Micronesia. N Engl J Med 2009;360:2536–2543.
- Martines RB, Bhatnagar J, Keating MK, et al. *Notes from the Field*: Evidence of Zika Virus Infection in Brain and Placental Tissues from Two Congenitally Infected Newborns and Two Fetal Losses — Brazil, 2015. MMWR Morb Mortal Wkly Rep 2016;65(Early Release):1–2..
- Mlakar J, Korva M, Tul N, et al. Zika Virus Associated with Microcephaly. NEJM 2016 Feb 10.
- 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.
- European Centre for Disease Prevention and Control. Zika virus epidemic in the Americas: potential association with microcephaly and Guillain-Barre syndrome. 21 January 2016. Stockholm: ECDC; 2016.
- Victora et al. Microcephaly in Brazil: how to interpret reported numbers? Lancet 2016. Epub February 5, 2016.
- The Subcommittee on Arbovirus Laboratory Safety of the American Committee on Arthropod-Borne Viruses. Laboratory safety for arboviruses and certain other viruses of vertebrates. Am J Trop Med Hyg 1980;29:1359–81.
- European Centre for Disease Prevention and Control. Rapid risk assessment: Zika virus epidemic in the Americas: potential association with microcephaly and Guillain-Barre syndrome. Stockholm, Sweden: European Centre for Disease Prevention and Control; 2015.
- Calvet Detection and sequencing of Zika virus from amniotic fluid of fetuses with microcephaly in Brazil: a case study. Lancet Infect Dis 2016. Epub February 17, 2016.

To Ask a Question

❑ **Using the Webinar System**

- “Click” the Q&A tab at the top left of the webinar tool bar
- “Click” in the white space
- “Type” your question
- “Click” ask

❑ **On the Phone**

- Press Star (*) 1 to enter the queue
- State your name
- Listen for the operator to call your name
- State your organization and then ask your question

Thank you for joining!
Please email us questions at coca@cdc.gov



Centers for Disease Control and Prevention
Atlanta, Georgia

<http://emergency.cdc.gov/coca>

Join Us on Facebook

CDC Facebook page for clinicians! “Like” our page today to learn about upcoming COCA Calls, CDC guidance and recommendations, and other health alerts



CDC Clinician Outreach and Communication Activity
<https://www.facebook.com/CDCClinicianOutreachAndCommunicationActivity>