Zika Virus Update for Clinicians

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April 26, 2016

Topics to be covered

- Brief overview of Zika virus disease
- Clinical presentation, diagnosis, management, and prevention
- Zika virus and pregnancy
  - CDC Guidance for Pregnant Women
  - US Zika Pregnancy Registry

Zika virus

Zika Virus Transmission and Current Domestic and International Situation

Susan Hills
Medical Epidemiologist
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What is Zika virus disease?

- Disease spread primarily through the bite of an *Aedes* mosquito infected with Zika virus
  - Aggressive daytime biters,
  - Live in and around households
  - Lay eggs in domestic water-holding containers
  - Also transmit dengue and chikungunya viruses

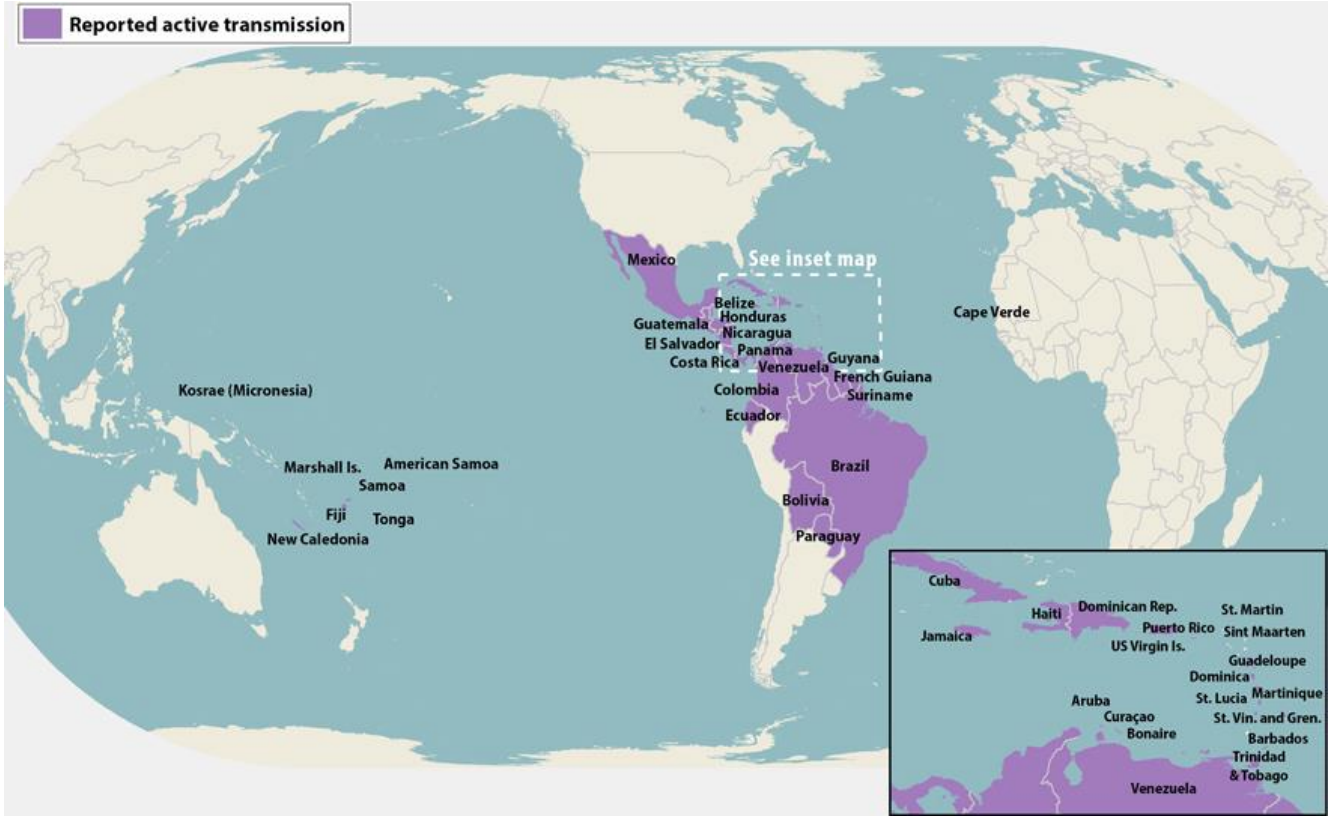
Aedes aegypti **mosquito**

Transmission of Zika virus

- Non-vector modes of transmission
  - Intrauterine and perinatal transmission
  - Sexual transmission
  - Laboratory exposure
- Theoretical modes of transmission
  - Blood transfusion
  - Organ or tissue transplantation
  - Breast milk
  - Fertility treatment

Petersen LR, Jamieson DJ, Powers AM, Honein MA. Zika virus. NEJM DOI: 10.1056/NEJMra1602113
CDC: All Countries and Territories with Active Zika Virus Transmission Link to Areas with Active Zika (accessed 4/11/16)

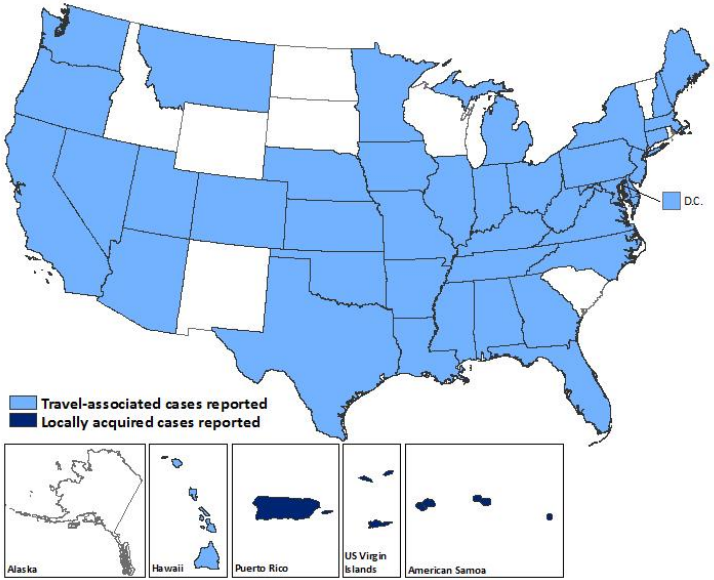
Where is Zika now?



35 countries and territories in the Americas and 43 countries worldwide reporting active Zika virus transmission (as of 4/20/16)

Status of Zika Virus in the United States

- Local vector-borne transmission of Zika virus has not been reported in the continental United States



Estimated Range of *Aedes aegypti* and *Aedes albopictus* Mosquitoes in the United States

Aedes aegypti

Aedes albopictus

*Maps have been updated from a variety of sources. These maps represent CDC's best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States. Map is not meant to represent risk for spread of disease.

Zika Virus

Zika Virus Presentation, Diagnosis, Management and Prevention

Maleeka Glover
Clinical Inquiries, Medical Investigations Team
April 26, 2016

Clinical Presentation

- Most people infected with Zika virus won't even know they have the disease because they won't have symptoms

- Symptoms are mild and last for several days to a week:
  - Fever, maculopapular rash, arthralgia, conjunctivitis
  - Myalgia, headache
  - Severe disease requiring hospitalization is uncommon

- Once a person has been infected, he or she is likely to be protected from future infections.

Diagnosis

- Preliminary diagnosis is based on the patient's clinical features, places and dates of travel, and activities
- Reverse transcription-polymerase chain reaction (RT-PCR) for viral RNA in serum collected ≤7 days after symptom onset
- Serology for immunoglobulin M (IgM) in serum collected ≥4 days after illness onset
- HCPs should contact their state or local health department to facilitate testing

http://www.cdc.gov/zika/hc-providers/diagnostic.html

Reporting

- Zika virus is a nationally notifiable condition
- State, local, and territorial health departments are encouraged to report laboratory-confirmed cases to CDC through ArboNET, the national surveillance system for arboviral diseases.
- Healthcare providers should report suspected Zika cases to their state, local, or territorial health department according to the laws or regulations for reportable diseases in their jurisdiction

Clinical Management

- No vaccine or specific antiviral treatment; supportive care
- Treat the symptoms:
  - Get plenty of 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
  - Avoid aspirin in children due to the association with Reye's syndrome
  - If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.

Prevention of Zika Virus Infection

- 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

Does Zika cause Guillain-Barré Syndrome (GBS)?

- GBS is an uncommon sickness of the nervous system in which a person's own immune system damages the nerve cells
- GBS symptoms include weakness of the arms and legs that is usually the same on both sides of the body
- These symptoms can last a few weeks or several months. Although most people fully recover from GBS, some people have permanent damage
- GBS is very likely triggered by Zika in a small proportion of infections, much as it is after a variety of other infections.
- CDC is investigating the link between Zika and GBS.

April 1, 2016

Morbidity and Mortality Weekly Report

Update: Interim Guidance for Prevention of Sexual Transmission of Zika Virus — United States, 2016

Alexandra M. Oster, MD[1]; Kate Russell, MD[2]; Jo Ellen Stryker, PhD[1]; Allison Friedman, MS[3]; Rachel E. Kachur, MPH[3]; Emily E. Petersen, MD[4]; Denise J. Jamieson, MD[4]; Amanda C. Cohn, MD[5]; John T. Brooks, MD[1]

On March 25, 2016, this report was posted as an MMWR *Early Release on the* MMWR *website (http://www.cdc.gov/mmwr).*

CDC issued interim guidance for the prevention of sexual transmission of Zika virus on February 5, 2016 (*1*). The following recommendations apply to men who have traveled to or reside in areas with active Zika virus transmission* and their female or male sex partners. These recommendations replace the previously issued recommendations and are updated to

onset; RT-PCR of blood at that time was negative (*7*). Because serial semen specimens were not collected for these three cases, the duration of persistence of infectious Zika virus in semen remains unknown.

All reported cases of sexual transmission involved vaginal or anal sex with men during, shortly before onset of, or shortly after resolution of symptomatic illness consistent with Zika virus disease. It is not known whether infected men who never

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

Couples in which a woman is pregnant

- Use condoms consistently and correctly or abstain from sex for the duration of the pregnancy

Other couples concerned about sexual transmission

- If man had confirmed Zika virus infection or clinical illness consistent with Zika virus disease
  - Should consider using condoms or abstaining from sex for at least 6 months after illness onset
- If man traveled to an area with active Zika virus transmission but did not develop symptoms
  - Should consider using condoms or abstaining from sex for at least 8 weeks after departure from the area
- If man resides in an area with active Zika virus transmission but has not developed symptoms
  - Might consider using condoms or abstaining from sex while active transmission persists

Oster AM, *et al*. Interim Guidelines for Prevention of Sexual Transmission of Zika Virus — United States, 2016. *MMWR Morb Mortal Wkly Rep* 2016;65:323-325

Zika Virus

Implications for Pregnant Women

Dana Meaney-Delman MD MPH, FACOG
Clinical Team, Pregnancy and Birth Defects Task Force

April 26, 2016

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," Frieden said.
–April 13, 2016

"…the last time an infectious pathogen (rubella virus) caused an epidemic of congenital defects was more than 50 years ago…"
– Rasmussen et al. April 13, 2016

"[Zika] became the first major infectious disease linked to human birth defects to be discovered in more than half a century and created such global alarm that the World Health Organization (WHO) would declare a Public Health Emergency of International Concern."
– Petersen et al. March 30, 2016

Zika Virus Infection in Pregnant Women

- Pregnant women can be infected
  - Through a mosquito bite
  - Through sex with an infected male partner
- If infected around conception,
  - Zika might present risk to fetus
- If infected during pregnancy,
  - Zika can be passed to the fetus during pregnancy or around the time of birth

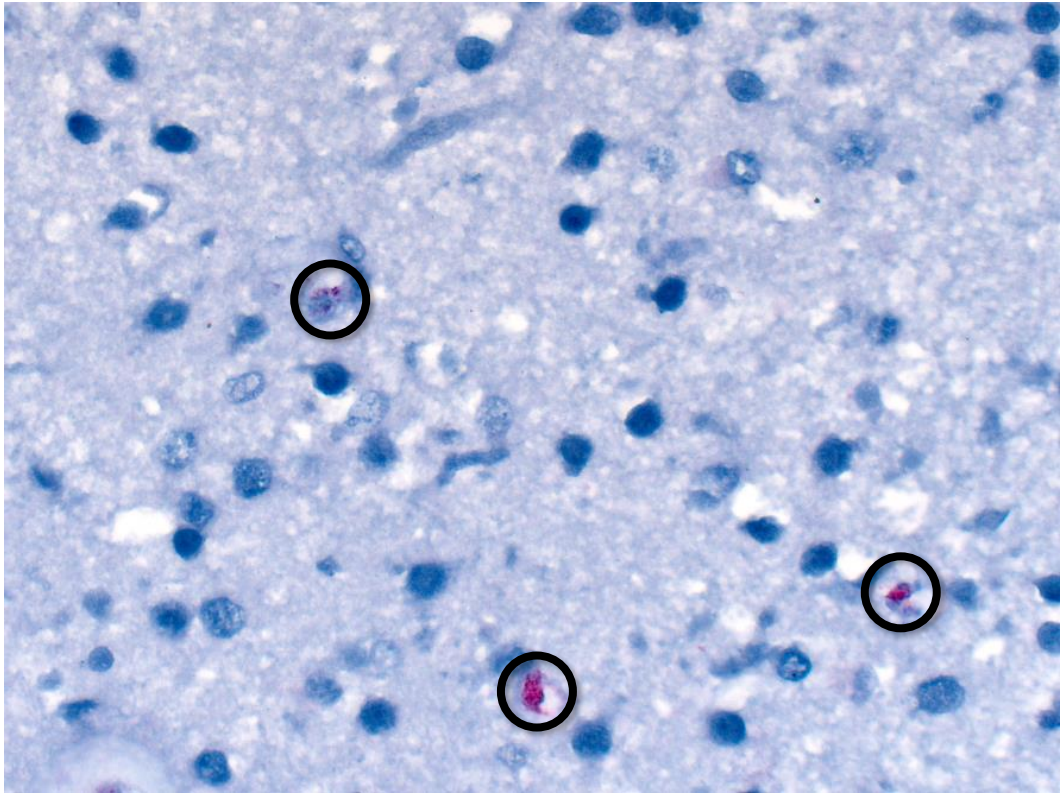
Zika Virus in Pregnancy

- Limited information demonstrates:
  - 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.

CDC Lab Confirms Zika In Fetal Tissues

- Zika virus RNA and/or antigen has been identified in:
  - Amniotic fluid
  - Placenta
  - Brain
  - Products of conception



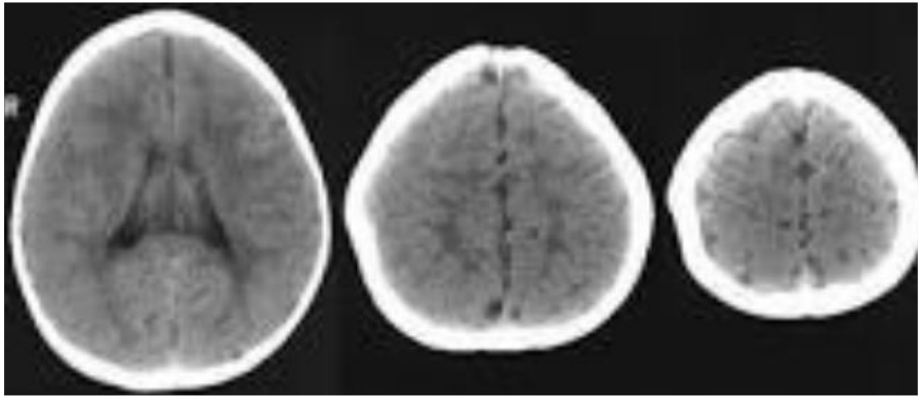
Brain Abnormalities Associated with Congenital Zika Virus Infection

- Intracranial calcifications
- Hydrocephalus ex-vacuo
- Hydranencephaly
- Pachygyria, lissencephaly
- Agyria
- Brain atrophy and asymmetry
- Enlargement of posterior fossa
- Ventriculomegaly
- Restricted middle cerebral artery flow
- Abnormally formed or absent structures
  - Corpus callosum
  - Thalami
  - Cerebellar vermis
  - Brainstem

Karwowski MP, Nelson JM, Staples JE, et al. Zika Virus Disease: A CDC Update for Pediatric Health Care Providers. Pediatrics. 2016;137(5):e20160621

Infants with Microcephaly

AP Photos/Felipe Dana



Note scattered intracranial calcifications

Note large ventricles and volume loss

Fetal Brain Disruption Sequence

- First described in 1984 but noted in earlier literature
- Brain destruction resulting in collapse of the fetal skull, microcephaly, scalp rugae and neurologic impairment
- Photos and x-ray from 1990 series*; phenotype appears to be present in affected babies in Brazil

*Moore, et al. J Pediatr 1990;116:383-386.

Zika Virus – Fetal Brain Abnormalities

- 2016 Brazil study: 42 women with laboratory-confirmed Zika virus infection with prenatal ultrasound
  - 12 (29%) abnormalities detected, including 2 intrauterine fetal deaths
  - 7 (17%) structural brain anomalies (microcephaly, calcifications, cerebellar atrophy, ventriculomegaly)
- 2013-14 outbreak in French Polynesia
  - 8 cases of microcephaly identified
  - Modeling estimated infection with Zika during 1st trimester of pregnancy resulted in microcephaly risk of ≈1%

Brasil P, Pereira JP Jr, Raja Gabaglia C, et al. Zika virus infection in pregnant women in Rio de Janeiro—preliminary report. N Engl J Med 2016. Published online March 4, 2016. http://dx.doi.org/10.1056/NEJMoa1602412
Cauchemez S, Besnard M, Bomopard P, et al. Association between Zika virus and microcephaly in French Polynesia, 2013-15: a retrospective study. Lancet 2016. Published online March 15, 2016. http://dx.doi.org/10.1016/S0140-6736(16)00651-6

Fetal Brain Abnormalities and Prolonged Viremia

2016 case report: pregnant woman with symptom onset 12 weeks' gestation

- Prenatal ultrasound
  - No prenatal diagnosis of microcephaly
  - Decrease in head circumference from 47th to 24th percentile 16-20 weeks
  - Abnormal intracranial anatomy at 19 weeks
  - Fetal MRI at 20 weeks: brain abnormalities, including diffuse cerebral atrophy
- Postmortem evaluation
  - Diffuse cerebral cortical thinning
  - High levels of Zika virus RNA; positive viral culture

Driggers RW, Ho C-Y, Korhonen EM, et al. Zika virus infection with prolonged maternal viremia ad fetal brain abnormalities. NEJM 2016 Mar 30. DOI: 10.1056/NEJMoa1601824

Reviewing the evidence for causality

Zika is a cause of microcephaly

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL REPORT

Zika Virus and Birth Defects — Reviewing the Evidence for Causality

HEALTH ZIKA

Zika Definitely Causes Birth Defects, U.S. Officials Announce

TIME

CBS EVENING NEWS w/SCOTT PELLEY

CDC confirms Zika virus causes microcephaly

Zika virus definitely causes birth defects, CDC says

By Debra Goldschmidt, CNN
Updated 9:45 PM ET, Wed April 13, 2016

CNN

Adverse Outcomes and Zika Virus

- A range of problems related to CNS injury have been detected among fetuses and infants with known or suspected congenital infection with Zika virus
  - Eye abnormalities
  - Hearing impairment
  - Seizures
  - Swallowing impairment
  - Hypertonicity and posturing
  - Contractures including club foot and arthrogryposis
  - Severe irritability
  - Developmental delay
  - Growth abnormalities include IUGR and disproportionate growth (head size alone affected)

Karwowski MP, Nelson JM, Staples JE, et al. Zika Virus Disease: A CDC Update for Pediatric Health Care Providers. Pediatrics. 2016;137(5):e20160621

Pregnancy Outcomes and Zika Virus

- Zika virus has been linked to spontaneous abortion and fetal demise but evidence is insufficient at this point in time to determine causality
- Researchers are collecting data to better understand the clinical spectrum of congenital Zika virus disease
  - US
  - Brazil
  - Colombia

Many Questions Remain

- What is the level of risk from a Zika virus infection during pregnancy?
- What is the level of risk when a woman has symptoms of Zika as compared to when she does not have symptoms?
- When during pregnancy Zika virus infection poses the highest risk to the fetus?
- What is the full range of potential health problems that Zika virus infection may cause?
- What are other factors (e.g., co-occurring infection) that might affect the risk for birth defects?

What CDC is Doing to Learn More

Collecting data for action

US Zika Pregnancy Registry

Zika Active Pregnancy Surveillance System (Puerto Rico)

Proyecto Vigilancia de Embarazadas con Zika (Colombia)

What CDC is Doing to Share Information

- Providing updated clinical guidelines
- Sharing up-to-date information
- Responding to your inquiries (24/7 hotline)

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Early Release / Vol. 65

February 19, 2016

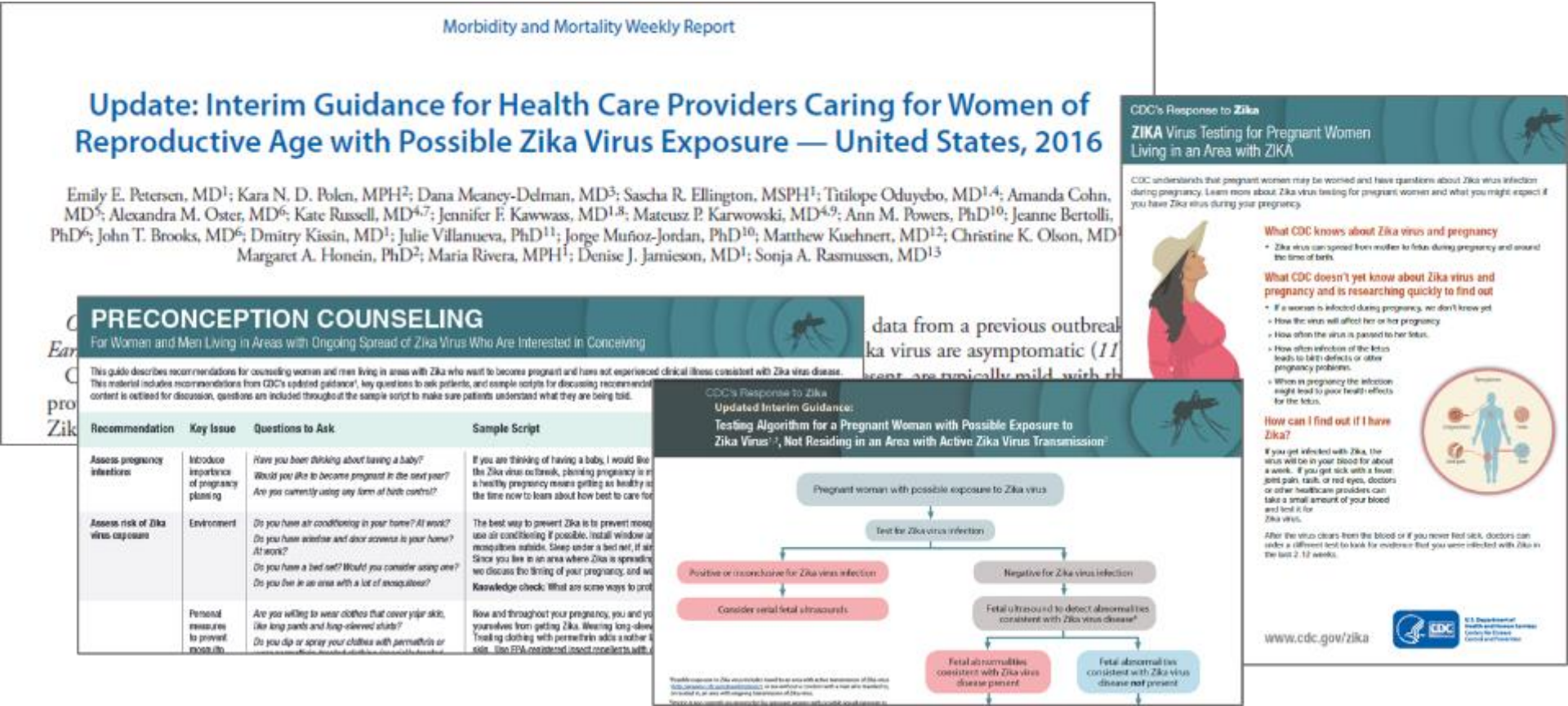
Update: Interim Guidelines for Health Care Providers Caring for Infants and Children with Possible Zika Virus Infection — United States, February 2016

Katherine E. Fleming-Dutra, MD[1]; Jennifer M. Nelson, MD[2,3]; Marc Fischer, MD[4]; J. Erin Staples, MD, PhD[4]; Mateusz P. Karwowski, MD[2,5]; Paul Mead, MD[4]; Julie Villanueva, PhD[6]; Christina M. Renquist, MPH[7]; Anna A. Minta, MD[2,8]; Denise J. Jamieson, MD[9]; Margaret A. Honein, PhD[7]; Cynthia A. Moore, MD, PhD[7]; Sonja A. Rasmussen, MD[10]

Clinical Inquiries Hotline

- Call the CDC Emergency Operations Center Watch Desk at 770-488-7100 and ask for the Zika Pregnancy Hotline
- Email ZikaMCH@cdc.gov.
- Zika virus information for clinicians: http://www.cdc.gov/zika/hc-providers/index.html

Tools for Healthcare Providers



Morbidity and Mortality Weekly Report

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

Emily E. Petersen, MD[1]; Kara N. D. Polen, MPH[2]; Dana Meaney-Delman, MD[3]; Sascha R. Ellington, MSPH[1]; Titilope Oduyebo, MD[1,4]; Amanda Cohn, MD[5]; Alexandra M. Oster, MD[6]; Kate Russell, MD[4,7]; Jennifer F. Kawwass, MD[1,8]; Mateusz P. Karwowski, MD[4,9]; Ann M. Powers, PhD[10]; Jeanne Bertolli, PhD[6]; John T. Brooks, MD[6]; Dmitry Kissin, MD[1]; Julie Villanueva, PhD[11]; Jorge Muñoz-Jordan, PhD[10]; Matthew Kuehnert, MD[12]; Christine K. Olson, MD[1]; Margaret A. Honein, PhD[2]; Maria Rivera, MPH[1]; Denise J. Jamieson, MD[1]; Sonja A. Rasmussen, MD[13]

PRECONCEPTION COUNSELING

For Women and Men Living in Areas with Ongoing Spread of Zika Virus Who Are Interested in Conceiving

This guide describes recommendations for counseling women and men living in areas with Zika who want to become pregnant and have not experienced clinical illness consistent with Zika virus disease.
This material includes recommendations from CDC's updated guidance[1], key questions to ask patients, and sample scripts for discussing recommenda
content is outlined for discussion, questions are included throughout the sample script to make sure patients understand what they are being told.

Recommendation	Key Issue	Questions to Ask	Sample Script
Assess pregnancy intentions	Introduce importance of pregnancy planning	*Have you been thinking about having a baby?* *Would you like to become pregnant in the next year?* *Are you currently using any form of birth control?*	If you are thinking of having a baby, I would like the Zika virus outbreak, planning pregnancy is m a healthy pregnancy means getting as healthy a the time now to learn about how best to care for
Assess risk of Zika virus exposure	Environment	*Do you have air conditioning in your home? At work?* *Do you have window and door screens in your home? At work?* *Do you have a bed net? Would you consider using one?* *Do you live in an area with a lot of mosquitoes?*	The best way to prevent Zika is to prevent mosq use air conditioning. If possible, install window a mosquitoes outside. Sleep under a bed net, if air Since you live in an area where Zika is spreading we discuss the timing of your pregnancy, and wo Knowledge check: What are some ways to prot
	Personal measures to prevent mosquito	*Are you willing to wear clothes that cover your skin, like long pants and long-sleeved shirts?* *Do you dip or spray your clothes with permethrin or*	Now and throughout your pregnancy, you and yo yourselves from getting Zika. Wearing long-slee Treating clothing with permethrin adds another l skin. Use EPA-registered insect repellents with

data from a previous outbreak
ka virus are asymptomatic (11
sent, are typically mild, with th

CDC's Response to Zika

Updated Interim Guidance:

Testing Algorithm for a Pregnant Woman with Possible Exposure to Zika Virus[1,2], Not Residing in an Area with Active Zika Virus Transmission[3]

CDC's Response to Zika

ZIKA Virus Testing for Pregnant Women Living in an Area with ZIKA

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

What CDC knows about Zika virus and pregnancy

- Zika virus can spread from mother to fetus during pregnancy and around the time of birth.

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

- If a woman is infected during pregnancy, we don't know yet
  - How the virus will affect her or her pregnancy
  - How often the virus is passed to her fetus.
  - How often infection of the fetus leads to birth defects or other pregnancy problems.
  - When in pregnancy the infection might lead to poor health effects for the fetus.

How can I find out if I have Zika?

If you get infected with Zika, the virus will be in your blood for about a week. If you get sick with a fever, joint pain, rash, or red eyes, doctors or other healthcare providers can take a small amount of your blood and test it for Zika virus.

After the virus clears from the blood or if you never feel sick, doctors can order a different test to look for evidence that you were infected with Zika in the last 2-12 weeks.

www.cdc.gov/zika

CDC Guidance for Healthcare Providers Caring for

Pregnant Women

CDC Recommendations:

Testing Asymptomatic Pregnant Women with Possible Exposure

- Serologic (IgM) testing can be offered to asymptomatic pregnant women
- Negative IgM result within 2-12 weeks after exposure could suggest a recent infection did not occur and obviate serial ultrasounds
- Information about performance of testing of asymptomatic persons limited

CDC Recommendations:

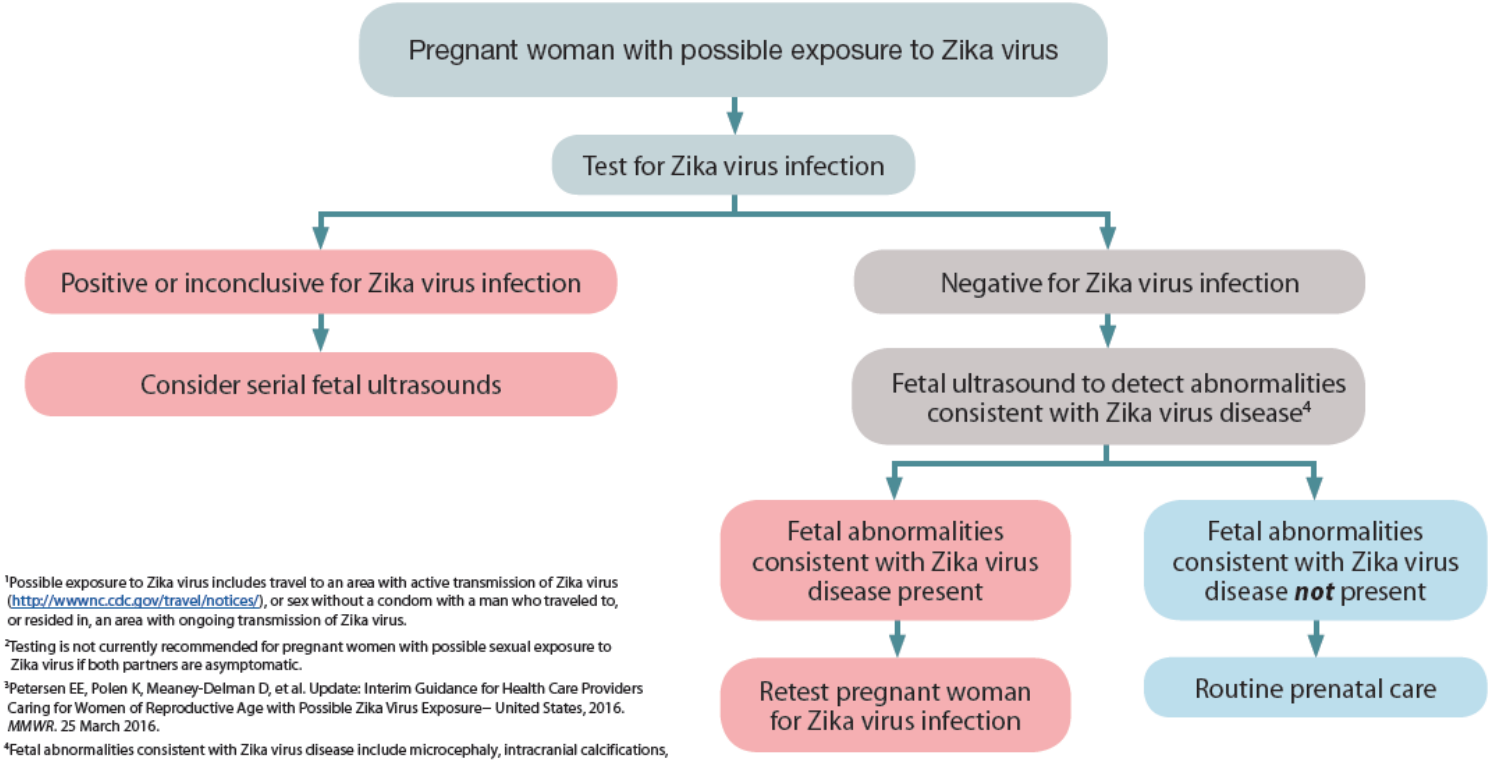
Testing Pregnant Women Travelers with Possible Exposure

- If one or more signs/symptoms of Zika virus disease within 2 weeks of travel, serum testing should be performed
- Testing can be offered to asymptomatic pregnant women with possible exposure
  - History of travel to an area with active Zika virus transmission or
  - Sex without a condom with a symptomatic male
- Testing is not currently recommended for pregnant women with possible sexual exposure to Zika virus if both partners are asymptomatic

CDC's Response to **Zika**

Updated Interim Guidance:

Testing Algorithm for a Pregnant Woman with Possible Exposure to Zika Virus[1,2], Not Residing in an Area with Active Zika Virus Transmission[3]



[1]Possible exposure to Zika virus includes travel to an area with active transmission of Zika virus (http://wwwnc.cdc.gov/travel/notices/), or sex without a condom with a man who traveled to, or resided in, an area with ongoing transmission of Zika virus.

[2]Testing is not currently recommended for pregnant women with possible sexual exposure to Zika virus if both partners are asymptomatic.

[3]Petersen EE, Polen K, Meaney-Delman D, et al. Update: Interim Guidance for Health Care Providers Caring for Women of Reproductive Age with Possible Zika Virus Exposure– United States, 2016. *MMWR*. 25 March 2016.

[4]Fetal abnormalities consistent with Zika virus disease include microcephaly, intracranial calcifications, and brain and eye abnormalities. Fetal ultrasounds might not detect abnormalities until late second or early third trimester of pregnancy.

CDC Recommendations:

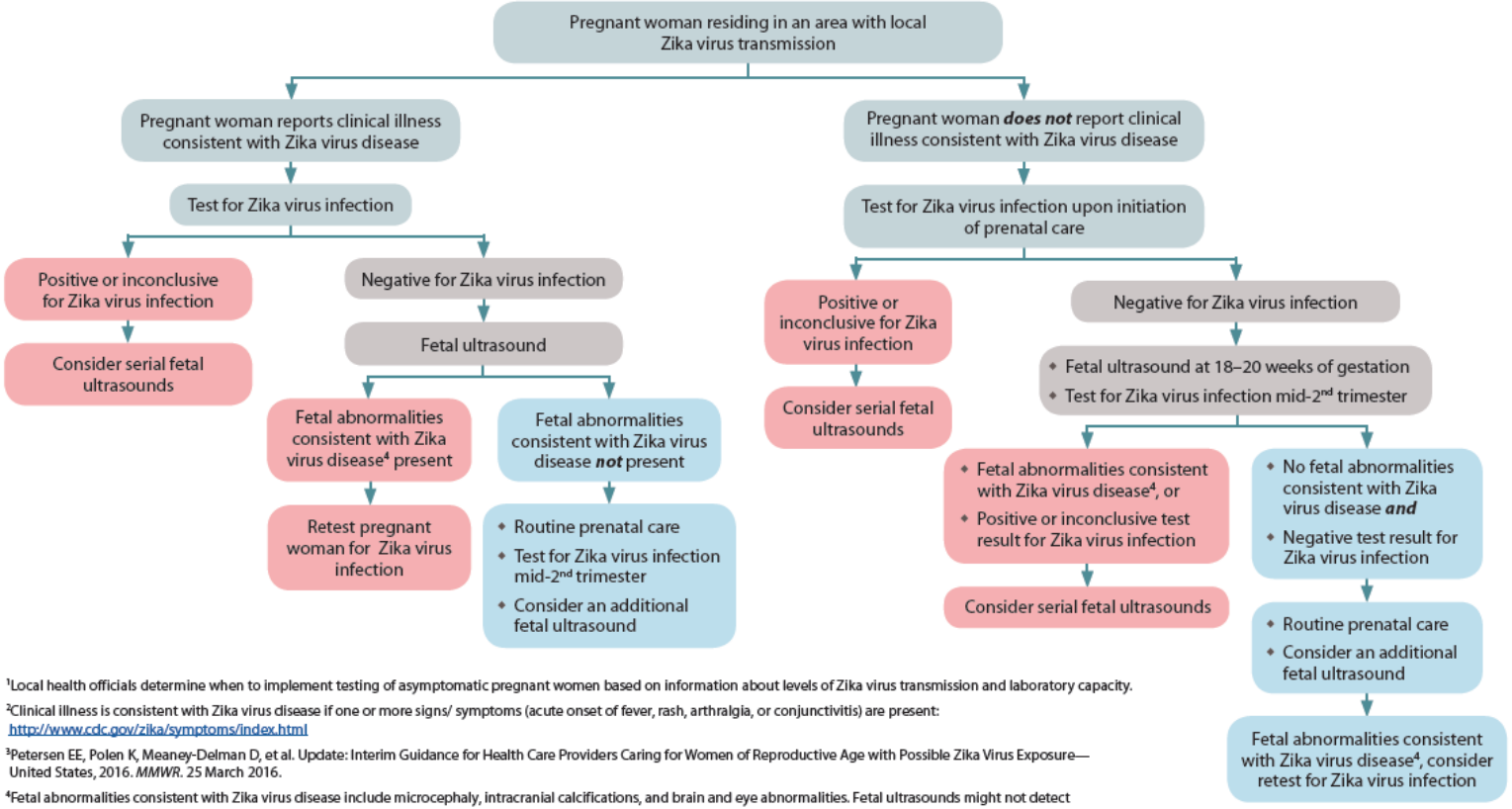
Testing Pregnant Women Who Reside in an Area with Zika

- If one or more signs/symptoms of Zika virus disease, testing should be performed at presentation
- If the woman does not report one or more signs/symptoms of Zika virus disease, serum IgM testing for Zika virus can be offered:
  - Upon initiation of prenatal care, and (if negative)
  - In mid-second trimester
- Repeat testing if develops symptoms
- 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

CDC's Response to **Zika**

Updated Interim Guidance:

Testing Algorithm for a Pregnant Woman Residing in an Area with Active Zika Virus Transmission[1], with or without Clinical Illness[2] Consistent with Zika Virus Disease[3]



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

[2]Clinical illness is consistent with Zika virus disease if one or more signs/ symptoms (acute onset of fever, rash, arthralgia, or conjunctivitis) are present: http://www.cdc.gov/zika/symptoms/index.html

[3]Petersen EE, Polen K, Meaney-Delman D, et al. Update: Interim Guidance for Health Care Providers Caring for Women of Reproductive Age with Possible Zika Virus Exposure—United States, 2016. *MMWR*. 25 March 2016.

[4]Fetal abnormalities consistent with Zika virus disease include microcephaly, intracranial calcifications, and brain and eye abnormalities. Fetal ultrasounds might not detect abnormalities until late second or early third trimester of pregnancy.

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

US Zika Pregnancy Registry

U.S. Zika Pregnancy Registry

- **Purpose of registry:** To monitor pregnancy and infant outcomes following Zika virus infection during pregnancy and to inform clinical guidance and public health response

- **How it works:** The registry is a supplemental surveillance effort coordinated by CDC and dependent on the voluntary collaboration of the state, tribal, local, and territorial health departments

U.S. Zika Pregnancy Registry

- **Who is included**: Pregnant women with laboratory evidence of Zika virus infection and exposed infants born to these women; infants with laboratory evidence of congenital Zika virus infection and their mothers

- **How can you support the registry?** Spread the word about the US Zika Pregnancy Registry and assist with health department follow-up for pregnant women and infants who are part of the registry

U.S. Zika Pregnancy Registry Forms

Mother's Zika virus infection (ADB follow-up)

Mother's name: _____ Last First MI

_____ Maiden name *(if applicable)*

State/Territory ID: _____

DOB: ____/____/____

State/Territory of residence: _____

County of residence: _____

Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic

Race *(check all that apply)*: ☐ American Indian or Alaska Native ☐ Asian ☐ Black or A
☐ Native Hawaiian or other Pacific Islander ☐ White

Indication for maternal Zika virus testing: ☐ Exposure history, no known fetal concerns
☐ Exposure history and fetal concerns

Date of Zika virus symptom onset: ____/____/____ OR- ☐ Asymptomatic

Neonate Assessment

Infant's name: _____ Last First MI

Birth Certificate ID: _____

Infant's State/Territory ID _____

Mother's State/Territory ID _____

DOB: ____/____/____

Sex: ☐ Male ☐ Female ☐ Ambiguous/undetermined

Based on: *(check all that apply)* ☐ LMP ___/___/___ ☐ U/S (1st trimester) ☐ U/S (2nd trimester) ☐ U/S (3rd trimester) ☐ Other_____

Gestational age at delivery: _____ weeks _____ days

State/Territory of residence: _____

County of residence: _____

Vaginal ☐ Caesarean section

ion: ☐ No ☐ Yes

Arterial Cord blood pH: *if performed* _____

Venous Cord blood pH: *if performed* _____

ased on path report): ☐ No ☐ Yes

al ☐ Abruption ☐ Inflammation ☐ Other abnormality *(please describe)*

Infant follow up: ☐ 2 months ☐ 6 months ☐ 12 months

Infant's name: _____ Last First MI

Date of infant examination ____/____/____

Infant's State/Territory ID _____

Mother's State/Territory ID _____

DOB: ____/____/____

Sex: ☐ Male ☐ Female ☐ Ambiguous/undetermined

Infant Death: ☐ No ☐ Yes, date ____/____/____ ☐ Unknown

Weight: _____ ☐grams _____ ☐ lbs/oz

Length: _____ ☐ cm _____ ☐ in

Head circumference _____ ☐ cm _____ ☐ in

Infant findings for corrected age at examination: (*For infants born preterm, please account for corrected age: chronological age minus weeks born before 40 weeks gestation*)

More information about Zika

- More information is available on the U.S. Zika Pregnancy Registry website at Registry website 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
- More information on caring for pregnant women, infants, or children with Zika virus infection is available at CDC's Zika website.

Thanks to our many collaborators and partners!

For clinical questions, please contact

ZikaMCH@cdc.gov

For U.S. Zika Pregnancy Registry questions, please contact

ZikaPregnancy@cdc.gov

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.

Additional slides

Special Considerations – Pregnant Women Living Along the U.S.-Mexico Border

- HCPs should assess patients' travel histories
  - Frequency of cross-border travel *and* destinations
  - Include discussion of sexual partners' travel
- Local health officials to determine when to implement testing of asymptomatic pregnant women based on
  - Information about local levels of transmission
  - Lab capacity

Updated Recommendations:

Testing for Persons with Possible Zika Virus Exposure Who Are Attempting Conception

- Testing of serum should be performed in persons with possible exposure to Zika virus who have one or more Zika-related symptoms

- Routine testing is not currently recommended for women or men who are attempting conception who have possible exposure to Zika virus but have NO symptoms

Updated CDC Recommendations:

Women and Men Interested in Conceiving

Background: viremia

- No current evidence that Zika virus will cause congenital infection in pregnancies conceived after resolution of maternal Zika viremia
- Incubation period for Zika virus disease 3-14 days
- Viremia range from a few days to 1 week (longest documented 11 days)

Interpretation of Prenatal and Postnatal Findings

- If postnatal findings differ from prenatal, clinical judgment is needed
- Example: Newborn with
  1) A prenatal diagnosis of microcephaly
  2) A normal head circumference after birth and normal examination
  - Newborn likely considered to NOT have abnormality consistent with congenital Zika virus disease
  - Newborn would qualify for right side of algorithm
  - Newborn's testing dependent on mother's testing