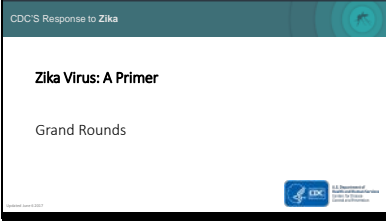

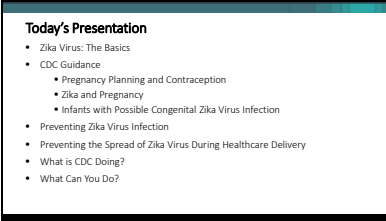
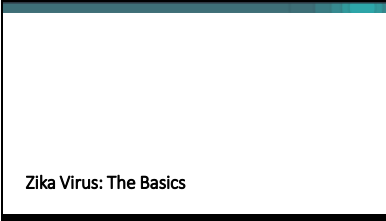
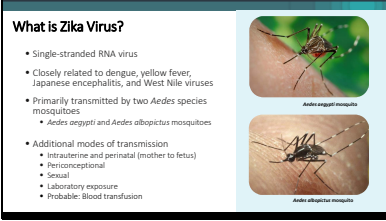




Zika Virus Grand Rounds Facilitation Guide: Nurses



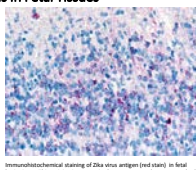
Intended Audience: Nurses

Estimated Length: 50 minutes

Updated June 26 2017

<p>Slide 1</p>		<ul style="list-style-type: none"> • Good [morning/afternoon/evening]. Today I'd like to share with you what is known about Zika virus.
<p>Slide 2</p>		<ul style="list-style-type: none"> • Today's Zika virus outbreak is unprecedented. Zika virus was first identified 70 years ago, but the recognition of the potentially devastating effects on pregnancy is a new phenomenon.
<p>Slide 3</p>		<ul style="list-style-type: none"> • My goal today is to share the most current information available, and encourage you to stay up-to-date as the science advances. Here's a brief outline of my presentation.
<p>Slide 4</p>		<ul style="list-style-type: none"> • First, let's start with some basics.
<p>Slide 5</p>		<ul style="list-style-type: none"> • Zika virus is a single-stranded RNA virus that is closely related to dengue, yellow fever, Japanese encephalitis, and West Nile viruses. • It is primarily transmitted by the bite of two <i>Aedes</i> species mosquitoes, <i>Aedes aegypti</i> and <i>Aedes albopictus</i>. • Zika virus is also transmitted through several other routes including


		<ul style="list-style-type: none"> • Intrauterine and perinatal transmission (transmission from mother to fetus) • Periconceptual • Sexual transmission • Laboratory exposure <ul style="list-style-type: none"> • And probably blood transfusion. To date, there have been no confirmed transfusion-transmission cases of Zika virus in the United States. However, cases of Zika virus transmission through platelet transfusions have been documented in Brazil.
Slide 6	<p>Zika Virus and Breastfeeding</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • While Zika virus RNA has been identified in breast milk, currently, there is no conclusive evidence of Zika virus transmission through breastfeeding • Based on the current evidence, the benefits of breastfeeding outweigh the theoretical risks of Zika virus transmission through breastmilk. • CDC and the World Health Organization recommend that infants born to women with possible or confirmed Zika virus infection, or who live in or have traveled to areas with risk of Zika, should be fed according to usual infant feeding guidelines.
Slide 7	<p>Areas with Risk of Zika</p> 	<ul style="list-style-type: none"> • This map shows countries and territories with risk of Zika. • Purple shading of a country doesn't necessarily mean that Zika virus is being spread across the entire country; it just means that Zika virus spread by local mosquitoes has been reported in at least one area of that country. Some countries with purple shading may have had Zika virus transmission in the past, are likely to have Zika virus transmission, or have low rates of steady Zika virus transmission. Visit the CDC website for more specific information about where Zika virus is locally transmitted. • To date, Florida and Texas have been the only states in the United States that have reported the spread of Zika through locally infected mosquitos. This occurred in small areas only in Miami-Dade County, Florida, and Brownsville, Texas.

<p>Slide 8</p>	<p>Clinical Presentation</p> <ul style="list-style-type: none"> • Clinical illness usually mild • Most common symptoms <ul style="list-style-type: none"> • Fever • Conjunctivitis (red eyes) • Rash • Joint pain • Headache • 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 	<ul style="list-style-type: none"> • Now I would like to switch gears and talk about some of the clinical aspects of Zika virus infection. <ul style="list-style-type: none"> • Many people infected with Zika virus won't have symptoms or will only have mild symptoms. • When symptoms do occur, the most common ones are fever, rash, headache, joint pain, conjunctivitis (red eyes), and muscle pain. • Symptoms typically last several days to a week. • Severe disease requiring hospitalization has been uncommon and fatalities have been rarely reported. • Based on similar infections, once a person has been infected with Zika virus and, it is believed that he or she may be protected from future infections.
<p>Slide 9</p>	<p>Clinical Management</p> <ul style="list-style-type: none"> • No vaccine or specific antiviral treatment • Treat the symptoms <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Although research is underway, there is currently no vaccine or specific antiviral treatment for Zika virus. • The cornerstone of treatment is supportive care. Patients should be advised to treat the symptoms, including recommending <ul style="list-style-type: none"> • Rest • Drink fluids to prevent dehydration. • Take medicine, such as acetaminophen to reduce fever and pain. • However, aspirin and NSAIDs should be avoided until dengue can be ruled out to reduce the risk of bleeding.
<p>Slide 10</p>	<p>CDC Lab Confirms Zika Virus In Fetal Tissues</p> <ul style="list-style-type: none"> • Zika virus has been shown to be present in fetal tissue • Evidence of Zika virus has been detected in <ul style="list-style-type: none"> • 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)  <p><small>Bhatnagar S, Williams SB, Martinez MA, et al. (2017) Zika virus antigen and genome in brain and placental tissue. Emerging Infectious Diseases 23(12):2141-2146. doi:10.1093/eid/cix111</small></p> <p><small>Immunohistochemical staining of Zika virus antigen (red stain) in fetal brain tissue. This staining is present in the same areas where neuronal cell death/dysplasia was identified by microscopic review of tissue morphology.</small></p>	<ul style="list-style-type: none"> • Zika virus has been found in fetal tissue. • Evidence of Zika virus has been detected in <ul style="list-style-type: none"> • Amniotic fluid • Placenta • Fetal brain tissue • Products of conception • This image shows immunohistochemical staining of Zika virus antigen (red stain) in fetal brain tissue. This staining is present in the same areas where neuronal cell death in the fetal brain was identified by microscopic review of tissue morphology. • A CDC study released December 13, 2016, found that Zika virus can continue to replicate in infants' brains even after birth. This information could have important implications for Zika virus-exposed babies born with microcephaly and for babies who are born without visible evidence of congenital Zika infection.

Slide 11

CDC Lab Confirms Zika Virus In Body Fluids

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



- Zika virus has been shown to be present in the following fluids in adults:
 - Blood
 - Semen
 - Vaginal fluids
 - Urine
 - Saliva
 - Breast milk
- Zika virus has been detected in these fluids, but the only known modes of transmission are via semen and vaginal fluids. Transmission via blood is probable but has not yet been established.

Slide 12

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	>120 days after symptom onset
Cultured virus from semen	69 days after symptom onset


- 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

- CDC reviewed data from several studies on virus shedding in blood and semen.
- Zika virus RNA has been detected in serum by PCR among
 - Non-pregnant people up to 11-13 days and
 - A pregnant woman over 11 weeks – 80 days – after symptom onset
- Zika virus RNA has been detected in whole blood up to 58 days in a non-pregnant person
 - But, Zika virus could not be cultured from the day 58 specimen
- Zika virus RNA has been detected in semen 188 days after symptom onset and has been cultured in semen up to 69 days after symptom onset
- Zika virus could persist in the body longer than has been documented by existing studies. CDC is conducting several studies in the continental United States and Puerto Rico to learn about how Zika virus persists in whole blood, serum, and other body fluids including semen.


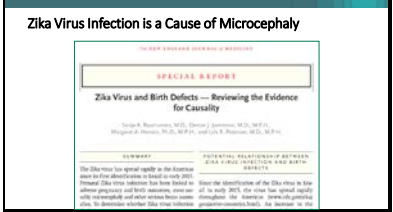

Slide 13

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

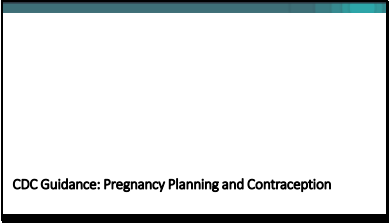


- Pregnant women can be infected with Zika virus through the same routes I discussed earlier, mainly
 - Through the bite of an infected mosquito or
 - Through sex without a condom with an infected partner
 - This includes vaginal, anal, and oral sex and the sharing of sex toys.
 - At this time there is no evidence to suggest that Zika virus can be passed through saliva during deep kissing.
- Zika virus may be passed to the fetus early on, around the time of conception. If this happens, the virus might present a risk to the fetus.
- If a woman is infected during pregnancy, Zika can be passed to the fetus during pregnancy or around the time of birth

<p>Slide 14</p>	<p>Zika Virus in Pregnant Women</p>  <ul style="list-style-type: none"> • 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 <p><small>Reproduced from: WHO Weekly Rep. on Zika Virus Infection in Pregnant Women, Guillain-Barré Syndrome, and Microcephaly. The Circulation of Zika Virus in the Americas. Weekly Rep. on Zika Virus Infection in Pregnant Women, Guillain-Barré Syndrome, and Microcephaly. The Circulation of Zika Virus in the Americas. 2016; 17(2): 1-4.</small></p>	<ul style="list-style-type: none"> • Incidence of Zika virus infection in pregnant women is not known. • Infection can occur in any trimester. • There is no evidence that pregnant women are more susceptible to Zika virus infection than non-pregnant women. • The clinical course of Zika virus infection is similar for pregnant women and non-pregnant people. • There does not appear to be a higher incidence of Guillain-Barré syndrome in pregnant women.
<p>Slide 15</p>	<p>Zika Virus Infection is a Cause of Microcephaly</p> 	<ul style="list-style-type: none"> • Before the current Zika virus outbreak, the relationship between Zika virus infection and microcephaly had not yet been confirmed. • The initial association between Zika virus and birth defects was suspected based on the number of cases over time. But increasing evidence became available because of the recent outbreaks to investigate a causal relationship. • In April 2016, in an article published in the New England Journal of Medicine, scientists at CDC concluded that Zika virus is a cause of microcephaly and other brain anomalies. • To reach this conclusion, the scientists conducted a systematic evaluation of the evidence, which supported a causal relationship between Zika virus infection and microcephaly and other serious brain anomalies.
<p>Slide 16</p>	<p>Congenital Zika Syndrome (CZS)</p> <ul style="list-style-type: none"> • Pattern of congenital anomalies associated with Zika virus infection during pregnancy that includes <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Have brain abnormalities consistent with congenital Zika syndrome • Develop microcephaly after birth 	<ul style="list-style-type: none"> • Congenital Zika syndrome is a recognizable pattern of congenital anomalies associated with Zika virus infection during pregnancy that includes: <ul style="list-style-type: none"> • 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 a head circumference at birth in the normal range can have brain abnormalities consistent with congenital Zika syndrome. • In addition, microcephaly from congenital Zika virus infection can develop after birth.

		<ul style="list-style-type: none"> Using data from three birth defects surveillance systems in the United States, scientists identified 747 infants and fetuses with one or more of these conditions from systems in the states of Massachusetts and North Carolina, and the city of Atlanta, GA, born from 2013-2014. This translated to a rate of 3 babies per 1,000 births in the pre-Zika years Data from the December USZPR report identified 26 infants and fetuses with these same birth defects among the 442 completed pregnancies of women with possible Zika virus infection from January through September 2016. This translates to a rate of 58 babies per 1,000 births – an approximately 20-fold increase. It is important to note that this is only among pregnant women included in the US Zika pregnancy – that is, those with lab evidence of possible Zika virus infection during pregnancy.
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Slide 20		<ul style="list-style-type: none"> A CDC Vital Signs report updated previously published estimates of the proportion of fetuses or babies with birth defects among pregnant women with possible Zika virus infection reported to the US Zika Pregnancy Registry. From January 15 to December 27, 2016, nearly 1,300 pregnant women with evidence of possible Zika virus infection were reported in 44 states. According to the report, which includes data from all US states and the District of Columbia (DC). Of these women, almost 1,000 pregnancies were completed by the end of 2016 and more than 50 of those babies had Zika virus-related birth defects. This is the first study to include a subgroup of pregnant women with laboratory confirmed Zika virus infection. Of the 250 cases of pregnant women with confirmed Zika virus infection in 2016, 24 – or about 1 in 10 of them – had a fetus or baby with Zika virus-related birth defects. Only 1 in 4 babies with possible congenital Zika virus infection were reported to have received brain imaging after birth, which is recommended by CDC. Brain imaging at birth is critical to identify babies who may appear healthy but have underlying brain defects and to ensure they receive the care that they need.
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Slide 21		<ul style="list-style-type: none"> Now, I will speak about CDC'S current guidance regarding pregnancy planning and contraception.
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Slide 22

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.



- Zika virus can be passed through sex from a person who has Zika to his or her sex partners, so travelers to areas with risk of Zika are encouraged to use condoms or not have sex.
 - Zika virus can be passed through sex even if the infected person does not have symptoms at the time.
 - It can be passed from an infected person before their symptoms start, while they have symptoms, and after their symptoms end.
 - The virus may also be passed by a person who has been infected with the virus but never develops symptoms.
- Sex includes vaginal, anal, oral sex, and the sharing of sex toys
- Zika virus has been found in genital fluids, including semen and vaginal fluids. Sexual exposure includes sex without a condom with a person who traveled to or lives in an area with risk of Zika.

Slide 23

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


As of June 1, 2017

- Here is a map of the world classifying countries based on their potential risk for Zika virus. Countries that are marked in dark pink are areas that have a CDC Zika travel notice. These are countries where the virus has been newly introduced or reintroduced and local mosquito-borne transmission is ongoing. The countries marked in light pink are areas with risk of Zika. The current level of risk for becoming infected with Zika virus in these areas is unknown. The dark blue area indicates the United States. The recommendations for areas in the United States with local transmission differs slightly.
- CDC recommends periods for waiting to conceive aligned with these risk categories and differentiated by presence of a Zika travel notice.

Slide 24

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

- The table on this slide shows the suggested timeframes for waiting to get pregnant after possible exposure to Zika virus via travel to an area with a CDC travel notice:
- Female travelers should wait at least 8 weeks after the last possible exposure or after symptoms start (if she developed symptoms) before trying to conceive.
- Male travelers should wait at least 6 months after last possible exposure or after symptoms start (if he developed symptoms) before trying to conceive.
- CDC does not recommend Zika virus testing for asymptomatic men, children, or women who are not pregnant and have traveled to areas with a CDC Zika travel notice.

Slide 25

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 or Zika virus infection symptoms	Wait at least 6 weeks after positive result or symptoms start	Wait at least 3 months after result or symptoms start
No testing performed or negative test	Talk with doctor or healthcare provider	Talk with doctor or healthcare provider




- The following recommendations are for people considering pregnancy who traveled to areas with risk of Zika but no CDC Zika travel notice.
- Because the level of risk in this area is unknown and information is limited about the risk of infection around the time of conception, women and their partners should talk with their healthcare provider if they have not had Zika test or received a negative test result.
- If women or men develop symptoms consistent with Zika virus infection and/or test positive for the virus, they should follow the suggested wait timeframes mentioned earlier before trying to conceive.

Slide 26

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.



- People who **live** in areas with a risk of Zika, with or without a CDC travel notice, should:
- Take steps to prevent mosquito bites.
- Talk with their 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 protect themselves from Zika.
- If they develop symptoms of Zika virus infection and test positive for the virus, they should follow the suggested timeframes above before trying to conceive.

Slide 27

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
 - Strategies to prevent unintended pregnancy
- If a woman decides to wait to conceive, HCPs should discuss
 - 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

- Preventing Zika virus infections during pregnancy is CDC’s top priority for the Zika virus response. This includes supporting women who want to delay or avoid pregnancy, in order to avert Zika virus-related pregnancy complications.
- Healthcare providers should discuss strategies to prevent unintended pregnancy, including counseling on family planning and the use of the most effective contraceptive methods that work for the woman and her partner’s lifestyle and can be used correctly and consistently.
- Healthcare providers should also advise patients to consider using condoms correctly and consistently, in addition to other birth control methods. Correct condom use will reduce the risk of acquiring or transmitting Zika virus and sexually transmitted infections.

Slide 28

CDC Guidance: Zika Virus Infection and Pregnancy

- Now, I will speak about CDC’S current guidance regarding pregnancy, travel, and Zika virus testing.

Slide 29



- Countries on this map marked in dark pink are areas that have a CDC Zika travel notice. These are countries where the virus has been newly introduced or reintroduced and local mosquito-borne transmission is ongoing.
- The countries marked in light pink are areas with risk of Zika. The current level of risk for becoming infected with Zika virus in these areas is unknown. The dark blue area indicates the United States. The recommendations for areas in the United States differs by region.
- CDC’s Zika virus testing recommendations for pregnant women have been aligned with these risk categories, and differentiated by presence of a Zika travel notice.
- Pregnant women who travel to countries marked in dark pink should be tested for Zika virus regardless of their symptom status.
- Pregnant women who travel to countries marked in light pink should only be tested if they become symptomatic or if their fetus has abnormalities noted on an ultrasound that may be related to Zika virus infection. Since the level of risk of Zika virus infection in these areas is unknown, routine testing is not recommended for asymptomatic pregnant women who have traveled to these areas.

Slide 30

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

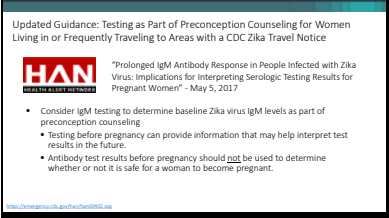
HAN
HEALTH ALERT NOTICE

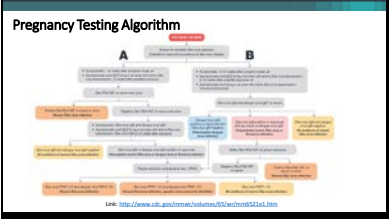
Prolonged IgM Antibody Response in People Infected with Zika Virus: Implications for Interpreting Serologic Testing Results for Pregnant Women May 5, 2017

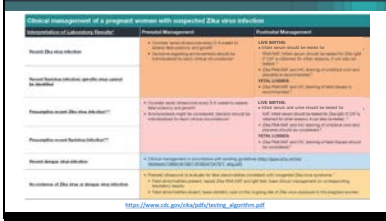


1. Screen pregnant women for risk of Zika virus exposure and symptoms of Zika virus infection. Promptly test pregnant women with NAT if they become symptomatic during their pregnancy or if a sexual partner tests positive for Zika virus infection.
2. Consider NAT testing at least once per trimester, unless 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.

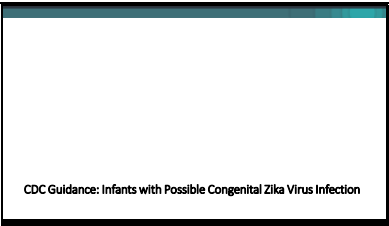
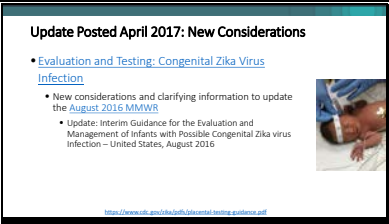
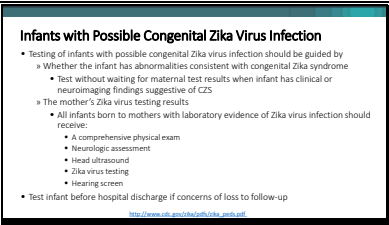
<https://www.cdc.gov/pregnancy/guidance/2017-05-05-zika-han.html>

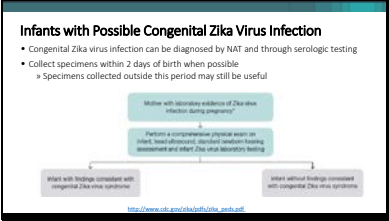
- Emerging epidemiologic and laboratory data indicate that Zika virus immunoglobulin, also referred to as IgM, can persist beyond 12 weeks in a subset of infected people making it difficult to determine the timing of infection, especially in testing of asymptomatic people. So detection of IgM may not always indicate a recent infection.
- It is possible that some women who are currently pregnant may have been previously infected and developed antibodies against Zika virus before pregnancy. The new data suggest that Zika virus infection, similar to some other flavivirus infections, may result in Zika virus antibodies staying in the body for months after infection, which may make it difficult to use these tests to determine whether women might have been infected before or after they became pregnant.
- On May 5, 2017, CDC issued a Health Alert Notice (HAN) with recommendations for the evaluation and clinical management of pregnant and non-pregnant women living in and frequently traveling to areas with transmission CDC Zika travel notice who may have been infected prior to conception.
- As previously recommended, healthcare providers should screen pregnant women for risk of Zika virus exposure and symptoms of Zika. Promptly test pregnant women with Zika nucleic acid testing, also referred to as NAT, if they become symptomatic during their pregnancy or if a sexual partner tests positive for Zika virus infection.


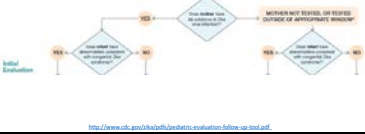
		<ul style="list-style-type: none"> • For asymptomatic pregnant women living in or frequently traveling to areas with a CDC Zika travel notice, the additional recommendations include: <ul style="list-style-type: none"> • Healthcare providers should consider Zika virus NAT testing at least once per trimester. NAT testing can occur concurrently with IgM testing in the 1st and 2nd trimester. • Healthcare providers should also consider NAT testing of amniocentesis specimens if amniocentesis is performed for other reasons and results should be interpreted within the context of the limitations of amniotic fluid testing • Similar to any disease, healthcare providers should counsel pregnant women each trimester on the limitations of IgM and NAT testing. • Continue to follow existing clinical guidance, including use of serial ultrasounds. • Use of these tests may be helpful, but may not always be conclusive, in determining how recent the infection is.
<p>Slide 31</p>		<ul style="list-style-type: none"> • CDC has also updated guidance on testing as part of preconception counseling for women living in or frequently traveling to areas with Zika virus transmission. • For non-pregnant women who want to conceive in the near future and who have an ongoing risk of Zika virus exposure, <ul style="list-style-type: none"> • Healthcare professionals can consider testing for Zika IgM. Testing shortly before pregnancy can provide information that may help interpret test results in the future if a woman is exposed to Zika virus in a subsequent pregnancy. For example, if a woman has a negative IgM result shortly before pregnancy and a subsequent positive IgM result during pregnancy, it is likely that this woman experienced a recent infection. • Antibody test results before pregnancy should not be used to determine if it is safe for a woman to become pregnant because the test results could have multiple interpretations. The CDC guidance also notes that test results represent a single point in time. Women who live in areas with a CDC Zika travel notice and who have never been infected with Zika virus are at continued risk of getting Zika virus. • CDC continues to evaluate all available evidence and will continue to update recommendations as new information becomes available.

<p>Slide 32</p>	 <p>The flowchart titled 'Pregnancy Testing Algorithm' is divided into two main paths, A and B. Path A is for pregnant women with symptoms of Zika virus infection. It starts with 'Symptoms of Zika virus infection' and leads to 'RNA NAT testing of serum and urine'. If positive, it confirms a diagnosis of recent maternal Zika virus infection. If negative, it leads to 'Zika IgM and dengue IgM antibody testing'. Path B is for pregnant women without symptoms. It starts with 'No symptoms of Zika virus infection' and leads to 'Zika IgM and dengue IgM antibody testing'. If positive or equivocal, it leads to 'RNA NAT testing of serum and urine'. If negative, it leads to 'No further testing'. The flowchart also includes a section for 'Asymptomatic pregnant women' who are evaluated 2-12 weeks after last possible exposure, leading to 'Zika IgM and dengue IgM antibody testing' and then 'RNA NAT testing of serum and urine' if positive or equivocal.</p>	<ul style="list-style-type: none"> The specific testing plan for a pregnant woman depends on several factors, including whether she has had symptoms of Zika virus infection and how much time has elapsed since her symptoms or last possible exposure to the virus. This is described in the CDC guidance. <ul style="list-style-type: none"> This flow chart was published in the updated pregnancy guidance in CDC’s Morbidity and Mortality Weekly Report on July 29, 2016. In the next few slides, I will briefly describe the guidance.
<p>Slide 33</p>	<p>Updated Guidance: Symptomatic Pregnant Women</p> <ul style="list-style-type: none"> Evaluated <2 weeks after symptom onset <ul style="list-style-type: none"> Should receive Zika virus NAT testing of serum and urine <ul style="list-style-type: none"> Positive NAT result confirms diagnosis: recent maternal Zika virus infection Negative NAT result does not rule out Zika virus infection <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Should first have a Zika virus IgM test <ul style="list-style-type: none"> If positive or equivocal, serum and urine NAT should be performed <p>http://www.cdc.gov/mmwr/pdf/wr/mm5912a1.htm http://www.cdc.gov/mmwr/pdf/wr/mm5912a1.htm</p>	<ul style="list-style-type: none"> Symptomatic pregnant women evaluated within 2 weeks after symptom onset should receive Zika virus testing of their serum and urine using RNA nucleic acid testing (NAT). A positive result confirms a diagnosis of a recent Zika virus infection. A negative result does not rule out infection. Therefore, if the NAT tests on both serum and urine are negative, then Zika IgM and dengue IgM antibody testing should be immediately performed. If evaluated within 2-12 weeks after symptom onset, a pregnant woman should first have a Zika IgM test, and if the test is positive or equivocal, NAT should be performed on serum and urine.
<p>Slide 34</p>	<p>Updated Guidance: Asymptomatic Pregnant Women</p> <ul style="list-style-type: none"> Living in areas <u>without</u> risk of Zika, evaluated <2 weeks after last possible exposure <ul style="list-style-type: none"> RNA NAT testing should be performed on serum and urine <ul style="list-style-type: none"> If the RNA NAT test is negative, Zika IgM test should be performed 2–12 weeks after exposure Living in areas <u>without</u> risk of Zika, evaluated 2–12 weeks after last possible exposure <ul style="list-style-type: none"> Should receive a Zika virus IgM antibody test <ul style="list-style-type: none"> If positive or equivocal, serum and urine RNA NAT should be performed Living in areas <u>with</u> risk of Zika <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> Consider NAT testing at least once per trimester, unless a previous test has been positive <p>http://www.cdc.gov/mmwr/pdf/wr/mm5912a1.htm http://www.cdc.gov/mmwr/pdf/wr/mm5912a1.htm</p>	<ul style="list-style-type: none"> For asymptomatic pregnant women who live in an area without risk of Zika but who may have been exposed to Zika virus <ul style="list-style-type: none"> If evaluated within 2 weeks after last possible exposure, NAT testing should be performed on serum and urine. If negative, Zika IgM testing should be performed 2-12 weeks after exposure. If evaluated 2-12 weeks after last possible exposure, Zika IgM testing should be performed. If positive or equivocal, NAT testing should be performed on serum and urine. Asymptomatic pregnant women who live in an area with risk of Zika should receive Zika IgM testing at the start of prenatal care and again during the 2nd trimester. Healthcare providers should also consider additional testing indicated by the Health Advisory Notice I mentioned previously.

<p>Slide 35</p>	<p>Updated Guidance: Testing Pregnant Women After 12 Weeks</p> <p>For symptomatic and asymptomatic pregnant women with possible Zika virus exposure who seek care >12 weeks after symptom onset or possible exposure</p> <ul style="list-style-type: none"> • 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. <p>http://www.cdc.gov/mmwr/preview/mmwrhtml/ww4912a1.htm?cid=mm4912a1_w</p>	<ul style="list-style-type: none"> • For pregnant women with possible Zika virus exposure who seek care more than 12 weeks after symptoms or possible exposure, Zika IgM antibody testing can be considered. • However, a negative result more than 12 weeks after symptom onset or possible exposure does not rule out infection, because IgM antibody and viral RNA levels decline over time. • Given the limitations of testing after 12 weeks, serial fetal ultrasounds should be considered.
<p>Slide 36</p>	 <p>http://www.cdc.gov/od/oc/media/press/2016/s011616zika.pdf</p>	<ul style="list-style-type: none"> • This tool is also available online at CDC.gov/Zika and provides information on the prenatal and postnatal management of pregnant women based on their laboratory test results.
<p>Slide 37</p>	<p>Prenatal Management: Confirmed or Presumptive Recent Zika Virus or Flavivirus Infection</p> <ul style="list-style-type: none"> • Serial ultrasounds every 3-4 weeks to assess fetal anatomy and growth • Amniocentesis <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Remind women who have confirmed or presumptive recent Zika virus infection to protect themselves from mosquito bites to prevent passing Zika virus to others  <p>http://www.cdc.gov/mmwr/preview/mmwrhtml/ww4912a1.htm?cid=mm4912a1_w</p>	<ul style="list-style-type: none"> • Prenatal management is similar for pregnant women with confirmed recent Zika virus or flavivirus and presumptive recent Zika virus or flavivirus infection. • Clinical management includes serial fetal ultrasounds every 3-4 weeks to assess fetal anatomy and monitor growth. • Amniocentesis should be individualized for pregnant women with confirmed recent Zika virus or flavivirus infection and can be considered for pregnant women with presumptive recent Zika virus or flavivirus infection. • It is also important for women who have been found to protect themselves against mosquito bites. <ul style="list-style-type: none"> • Keeping people infected with Zika virus from getting mosquito bites will prevent Zika virus from passing from these people to mosquitoes and then to other people, and will help protect household members, close contacts, and others from getting Zika.
<p>Slide 38</p>	<p>CDC Materials for Pregnant Women with Suspected Zika Virus Infection</p>  <p>http://www.cdc.gov/od/oc/media/press/2016/s011616zika.pdf</p>	<ul style="list-style-type: none"> • CDC has created different tools to help counsel pregnant women on Zika virus testing, including pre-testing counseling, fact sheets, and scripts for clinicians; materials about testing to give directly to the patients, and fact sheets to help women understand the implications of their results.


<p>Slide 39</p>	 <p>CDC Guidance: Infants with Possible Congenital Zika Virus Infection</p>	<ul style="list-style-type: none"> Now, I will speak about CDC'S current guidance regarding infants with possible congenital Zika virus infection.
<p>Slide 40</p>	 <p>Update Posted April 2017: New Considerations</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Recommendations for infant evaluation and management are based on CDC'S August 2016 MMWR on the evaluation and management of infants with possible Zika, and new considerations released by CDC in April 2017.
<p>Slide 41</p>	 <p>Infants with Possible Congenital Zika Virus Infection</p> <ul style="list-style-type: none"> Testing of infants with possible congenital Zika virus infection should be guided by <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> All infants born to mothers with laboratory evidence of Zika virus infection should receive: <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Maternal Zika virus testing should be performed if the exposure to Zika virus occurred within the last 12 weeks. Testing of infants with possible congenital Zika virus infection should be guided by <ul style="list-style-type: none"> Whether the infant has abnormalities consistent with congenital Zika syndrome <ul style="list-style-type: none"> In cases where an infant has abnormal clinical or neuroimaging findings suggestive of congenital Zika syndrome and a maternal epidemiologic link suggesting possible exposure during pregnancy, Zika virus laboratory testing is recommended regardless of maternal Zika virus test results. The mother's Zika virus testing results <ul style="list-style-type: none"> All infants born to mothers with laboratory evidence of congenital Zika virus infection during pregnancy should receive a comprehensive physical exam and head ultrasound before discharge from the

		<p>hospital. They should also receive a neurologic assessment, Zika virus lab testing, and newborn hearing screen.</p> <ul style="list-style-type: none"> • If maternal test results have not yet been received and the infant appears clinically well, further evaluation, including head ultrasound and infant laboratory Zika virus testing, can be deferred until results from the mother's test are available. • If there is concern about loss to follow-up, or negative, or no maternal test results in the setting of an exposure that occurred more than 12 weeks earlier, head ultrasound, ophthalmologic assessment, and testing of the infant's specimens should be considered before hospital discharge. • A postnatal head ultrasound should be performed on all infants before discharge from the hospital, regardless of maternal and infant testing. This should include those infants with normal prenatal ultrasound findings, because some abnormal findings associated with congenital Zika syndrome might not be readily apparent on prenatal ultrasounds.
Slide 42	<p>Infants with Possible Congenital Zika Virus Infection</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • When an infant is tested, a Zika virus NAT test should be performed on both infant serum and urine, and Zika virus immunoglobulin M (IgM) antibody should be performed on infant serum. • Testing should be performed on specimens collected from infants within 2 days after birth; however, testing specimens collected within the first few weeks to months after birth may still be useful in the evaluation for possible congenital Zika virus infection, especially among infants born in areas without risk of Zika. • Further evaluation should be dependent upon whether or not the infant has findings consistent with congenital Zika syndrome.

<p>Slide 43</p>	<p>Testing Babies for Zika Virus Infection: New Considerations</p> <ul style="list-style-type: none"> • Testing of cerebrospinal fluid (CSF) <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Consider testing of the placenta for Zika virus PCR  <p><small>https://www.cdc.gov/zika/nczid/infants-childen/evaluation-testing.html</small></p>	<ul style="list-style-type: none"> • CDC interim infant testing guidance recommends that Zika virus testing should be performed on cerebrospinal fluid if it was collected for other reasons; however, there are limited reports of congenital Zika virus infection in which CSF was the only sample testing positive. Therefore, healthcare providers should consider obtaining CSF for Zika virus RNA and IgM antibody testing in infants with clinical findings of possible congenital Zika syndrome but whose initial laboratory tests are negative on serum and urine. • Testing of the placenta for Zika virus PCR should be considered. More information about placental testing can be found on the CDC website.
<p>Slide 44</p>	<p>Infants with Possible Congenital Zika Virus Infection</p> <p>Recommendations for follow up depend on whether these infants have abnormalities consistent with CZS</p>  <p><small>http://www.cdc.gov/zika/nczid/infants-evaluation-follow-up-tool.pdf</small></p>	<ul style="list-style-type: none"> • Recommendations for follow up after initial screening and testing depend on whether these infants have abnormalities consistent with congenital Zika infection. This tool is available at http://www.cdc.gov/zika/pdfs/pediatric-evaluation-follow-up-tool.pdf
<p>Slide 45</p>	<p>Initial Evaluation</p> <p>Infants with abnormalities consistent with CZS born to a mother with lab evidence of Zika virus infection</p> <ul style="list-style-type: none"> • Before hospital discharge: <ul style="list-style-type: none"> ✓ 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 <p><small>https://www.cdc.gov/zika/nczid/infants-childen/initial-evaluation.html</small></p>	<ul style="list-style-type: none"> • The initial exam of an infant with abnormalities consistent with congenital Zika syndrome, born to a mother with lab evidence of Zika virus infection, should include <ul style="list-style-type: none"> • All the components of routine newborn care, which include a physical exam, including head circumference, weight, and length • A neurologic exam • A universal hearing screen • A head ultrasound • Specimen testing for congenital Zika virus infection • Complete blood count, metabolic panel and liver enzyme testing • It may be necessary to consult with multiple subspecialists • Comprehensive eye exam by an ophthalmologist • A hearing evaluation using auditory brainstem response (ABR) • Advanced cranial imaging, such as an MRI, and transfer to a hospital that can provide subspecialty care should also be considered. • Refer for a comprehensive ophthalmologic exam and evaluation of hearing by ABR testing before one month of age.

<p>Slide 46</p>	<p>Consult with Specialists Infants with abnormalities consistent with CZS and lab evidence of Zika virus Infection</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • For infants with abnormalities consistent with congenital Zika syndrome AND lab evidence of Zika virus infection, the following specialists should be consulted to assist in the management of care: <ul style="list-style-type: none"> • Neurologist • Infectious disease specialist • Ophthalmologist • Endocrinologist • Clinical geneticist
<p>Slide 47</p>	<p>Consult with Specialists Infants with abnormalities consistent with CZS and lab evidence of Zika virus Infection</p> <p>Consultation with the following should also be considered:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Clinicians should also consider consulting with an <ul style="list-style-type: none"> • Orthopedist, physiatrist or physical medicine, a rehabilitation physician, and physical therapist to manage hypertonia, club foot, or arthrogryptic-like conditions • And a Pulmonologist or otolaryngologist to consult about aspiration • Additionally, a lactation specialist, nutritionist, gastroenterologist, or speech or occupational therapist, to manage feeding issues
<p>Slide 48</p>	<p>Outpatient Management Infants with abnormalities consistent with CZR and lab evidence of Zika virus Infection</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • To effectively manage an infant with congenital Zika syndrome AND lab evidence of congenital Zika virus infection, the following steps should be taken: <ul style="list-style-type: none"> • Establish a medical home to facilitate coordination of care • Provide routine preventive pediatric health care, including immunizations • Conduct developmental monitoring at each routine visit • Complete a neurologic exam at age 1 and 2 months, then as needed • Refer 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

		<ul style="list-style-type: none"> • Provide information about family support and early intervention services • Additionally family and psychosocial support should be provided. I will go into detail about what this entails a little bit later.
<p>Slide 49</p>	<div data-bbox="302 680 688 898" style="border: 1px solid black; padding: 5px;"> <p>Initial Evaluation & Outpatient Management Infants with lab evidence of Zika and without abnormalities consistent with congenital Zika syndrome</p> <ul style="list-style-type: none"> • 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 </div>	<ul style="list-style-type: none"> • An infant who is born with lab evidence of congenital Zika infection but without abnormalities consistent with congenital Zika syndrome should receive: <ul style="list-style-type: none"> • Routine care including monitoring of head (occipitofrontal) circumference, length, and weight before hospital discharge • Outpatient management includes routine follow-up care and: <ul style="list-style-type: none"> • A medical home should be established for the infant. • Developmental monitoring should be conducted at every visit • Emphasize anticipatory guidance for families regarding developmental milestones, feeding and growth, sleep and irritability, and abnormal movements. • Perform age-appropriate standardized validated developmental screening at 9 months • Infant should be referred to ophthalmologist within one month of birth. Vision screening and assessment of visual regard should be performed at every well child visit. • To 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. • Any children identified with or suspected of delays should be referred to early intervention programs. • Family and support services need to be provided.

<p>Slide 50</p>	<p>Pediatric Evaluation and Follow-Up Care: New Considerations</p> <ul style="list-style-type: none"> • Imaging <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.
<p>Slide 51</p>	<p>Initial Evaluation & Outpatient Management Infants with abnormalities consistent with congenital Zika syndrome born to a mother without lab evidence of Zika virus infection</p> <ul style="list-style-type: none"> • Maternal and infant Zika virus testing • Infants should receive <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Initial evaluation of infants with abnormalities consistent with congenital Zika syndrome born to a mother without lab evidence of Zika virus infection should include <ul style="list-style-type: none"> • Maternal and infant Zika virus testing • 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, LFTs • Vision screening and assessment of visual regard • ABR testing • Providers may also consider <ul style="list-style-type: none"> • Testing placenta for Zika virus • Further neuroimaging if available, and • Transfer to hospital with subspecialty care • Any children identified with or suspected of delays should be referred to early intervention programs.
<p>Slide 52</p>	<p>Pediatric Evaluation and Follow Up: New Considerations</p> <ul style="list-style-type: none"> • Maintain a level of suspicion <ul style="list-style-type: none"> • For infants without laboratory evidence of Zika virus infection but for whom suspicion for congenital Zika virus infection remains, healthcare providers should <ul style="list-style-type: none"> » 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 	<ul style="list-style-type: none"> • Because Zika virus testing is not perfect, clinicians should 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 <ul style="list-style-type: none"> • Evaluate the infant (and mother) for other causes of congenital infection • Consider an ophthalmology exam and auditory brainstem response (ABR) hearing test before hospital discharge or within 1 month of birth • Consider performing other evaluation and follow up in accordance with CDC interim guidance for the evaluation and management of infants with possible congenital Zika virus infection

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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>

- Families and caregivers of infants with congenital Zika virus infection will require ongoing psychosocial support. Supporting the family of a child with a birth defect is part of the health care provider's job.
 - 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 through links to national, state, and local health programs.
- Additional resources for families can be found by following the link shown here where you can find other sources of help like support groups, public health and medical services, and current medical information.

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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](#)

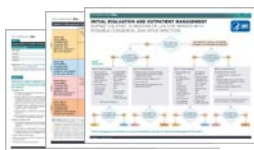


- The following are special considerations for nursing staff working with newborns and families affected by congenital Zika syndrome
 - Ensure that recommended screening is received
 - Follow up with lab results and counseling of family
 - Follow standard precautions in nursery
 - Assist with reporting to the US Zika Pregnancy Registry
- CDC has toolkits, algorithms, and other guides to assist nurses and other healthcare providers with these actions.

Slide 55

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






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

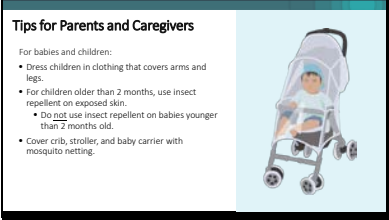
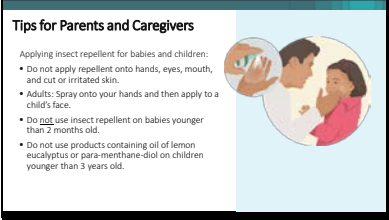
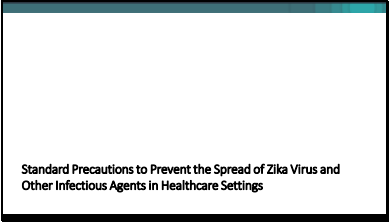
- This guidance on evaluation and outpatient management has also been summarized in a tool or pocket guide for clinicians. You can download this from the CDC website.

Slide 56

Preventing Zika Virus Infection

- As I mentioned, Zika virus infection has serious potential health implications for pregnant women and their fetuses. Now I will discuss information and tips for Zika virus infection prevention.


<p>Slide 57</p>	<p>Do Not Travel to Areas with Risk of Zika</p> <ul style="list-style-type: none"> Pregnant women should not travel to areas with risk of Zika. If a pregnant woman must travel, she should <ul style="list-style-type: none"> 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.  <p>http://www.cdc.gov/travel/page/zika-information</p>	<ul style="list-style-type: none"> First, CDC recommends that pregnant women not travel to areas with a risk of Zika. If a pregnant woman must travel to an area with a risk of Zika, she should talk to her healthcare provider before departing and strictly follow steps to prevent mosquito bites and prevent sexual transmission during and after her trip. She should also talk to her healthcare provider once she returns from traveling, even if she doesn't feel sick.
<p>Slide 58</p>	<p>Prevent Mosquito Bites</p> <p>People who live in or travel to an area with risk of Zika should</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> DEET, picaridin, IR3535, oil of lemon eucalyptus, para-methane-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 	<ul style="list-style-type: none"> All people who live in or travel to an area with a risk of Zika can reduce the risk of Zika virus infection by preventing mosquito bites. An asymptomatic infected person who has returned from travel can get bitten by a mosquito which can then spread the virus to others, so it is important to take steps to prevent mosquito bites after returning from areas with risk of Zika. Mosquito bites can be prevented by wearing long-sleeved shirts and long pants. Whenever possible, people should also stay and sleep in air-conditioned places or places that have windows and door screens. The use of insect repellants containing EPA-registered ingredients is important. Insect repellents should contain one of the following active ingredients, such as DEET, listed on this slide. When used as directed, these insect repellents are proven safe and effective, even for pregnant and breastfeeding women. Finally, items that hold water such as tires, planters, and birdbaths should be emptied and scrubbed, turned over, covered, or thrown out once a week since mosquitoes lay eggs near standing water.
<p>Slide 59</p>	<p>Prevent Sexual Transmission of Zika Virus</p> <p>A pregnant woman whose partner lives in or has traveled to an area with risk of Zika should</p> <ul style="list-style-type: none"> Use condoms correctly every time they have sex, or Not have sex <p>For the duration of the pregnancy, even if the pregnant woman or her partner does not have symptoms or feel sick.</p> 	<ul style="list-style-type: none"> I discussed sexual transmission earlier in this presentation, but as a reminder, Zika virus can be passed through sex from an infected person to his or her sex partners, so travelers are encouraged to use condoms or not have sex for the duration of the pregnancy, even if the pregnant woman's partner does not have symptoms or feel sick. The following messages should be shared with patients: <ul style="list-style-type: none"> Not having sex eliminates the risk of getting Zika virus infection from sex. Condoms can reduce the chance of getting Zika virus infection from sex. To be effective, condoms should be used consistently and correctly from start to finish, every time. Not sharing sex toys may reduce the risk of spreading Zika virus to sex partners.

		<ul style="list-style-type: none"> • It is important to follow these precautions for the entire pregnancy, even if the woman’s partner does not have symptoms or feel sick. People can spread Zika virus without ever knowing they had it. It is not yet known how long a person with Zika virus remains infected.
<p>Slide 60</p>		<ul style="list-style-type: none"> • To help prevent Zika virus infections in children, parents and caregivers in areas with risk of Zika should <ul style="list-style-type: none"> • Dress their children in clothing that covers arms and legs • For children older than 2 months, use insect repellent on exposed skin. <ul style="list-style-type: none"> • Do not use insect repellent on babies younger than 2 months old. • Cover a child’s crib, stroller, and baby carrier with mosquito netting.
<p>Slide 61</p>		<ul style="list-style-type: none"> • Remind parents that when applying insect repellent with EPA-registered ingredients, they should follow these rules: <ul style="list-style-type: none"> • Do not apply repellent onto hands, eyes, mouth, or cut or irritated skin. • Adults should spray the repellent onto your hands and then apply to a child’s face. • Do not use insect repellent on babies younger than 2 months. • Do not use products containing oil of lemon eucalyptus or para-menthane-diol on children younger than 3 years old.
<p>Slide 62</p>		<ul style="list-style-type: none"> • Now I will discuss Zika virus control and prevention in healthcare settings.

Slide 63

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)



- To date, there have been no reports 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), so standard infection prevention precautions are still necessary.

Slide 64

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

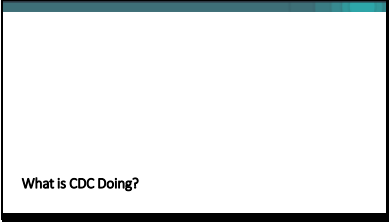
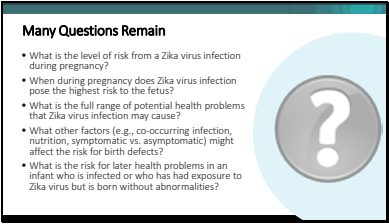
- Healthcare personnel must adhere to Standard Precautions in all healthcare settings.
- This is existing guidance, but the Zika virus outbreak provides an opportunity to emphasize the importance of following these existing protective recommendations.
- Standard Precautions are basic measures to prevent infection and are a group of practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which health care is delivered.
- The goals of implementing standard precautions are to
 - Prevent direct contact between a patient's body fluids and the healthcare provider's mucous membranes or broken skin,
 - To protect healthcare providers and prevent them from transmitting potentially infectious material from one patient to another; and
 - To avoid percutaneous exposure to contaminated sharp implements.

Slide 65

Standard Precautions: Personal Protective Equipment (PPE)

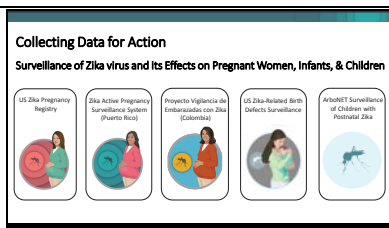
- Healthcare personnel education and training in the use of PPE is an Occupational Safety and Health Administration (OSHA) requirement
- Gloves, gowns, face masks, face shields, goggles
- Facilities should assure availability and accessibility of PPE to HCP
- Educate all HCP on proper selection and correct 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

- One component of Standard Precautions is the use of personal protective equipment (or PPE), such as gloves, gowns, face masks, face shields, and goggles.
- Facilities should assure that sufficient and appropriate PPE is available and readily accessible to healthcare personnel. In addition, healthcare personnel should be educated on the proper selection and correct use of PPE.
- Examples of high risk obstetric procedures that require increasing amounts of PPE in the labor and delivery setting include
 - Vaginal examinations, particularly during amniotomy, when exposure to fluids would be expected;
 - Performing a vaginal delivery or manual removal of a placenta when exposure to larger volumes of fluids would be anticipated; and

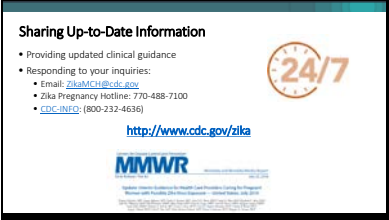

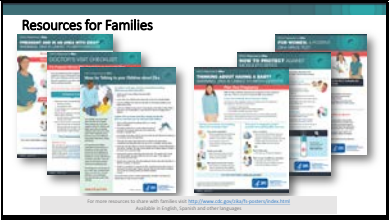
		<ul style="list-style-type: none"> • Procedures in an operating room setting.
Slide 66		<ul style="list-style-type: none"> • CDC is working with many partners to better understand the health effects of Zika virus and to identify prevention and control strategies.
Slide 67		<ul style="list-style-type: none"> • Our understanding of Zika virus continues to evolve. Although we have learned about the association of Zika and poor pregnancy outcomes in a short amount of time, many questions remain. • For example: <ul style="list-style-type: none"> • 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? • Answering these critical questions is a focus of ongoing CDC research and may help improve prevention efforts and ultimately help reduce the effects of Zika virus infection during pregnancy.

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Slide 68



- This slide lists some of what CDC is doing to learn more about Zika virus infection during pregnancy.
 - CDC established the US Zika Pregnancy Registry in collaboration with state, tribal, local, and territorial health departments in the United States and US territories (excluding Puerto Rico). The Registry collects information about women with laboratory evidence of possible Zika virus infection during pregnancy, whether or not they have symptoms, and their infants.
 - CDC collaborated with the Puerto Rico Department of Health to develop a similar system in Puerto Rico, the Zika Active Pregnancy Surveillance System.
 - Additionally, enhanced surveillance of pregnant women with Zika virus infection in Colombia has been established.
 - CDC funded 50 jurisdictions in the US to establish or enhance Zika-related birth defects surveillance systems that monitor brain abnormalities, including microcephaly, and central nervous system defects, to better understand Zika virus exposure during pregnancy and adverse outcomes.
 - CDC manages the collection of data through ArboNET in collaboration with state and territorial health departments. ArboNET is the national arboviral surveillance system that collects information on laboratory-confirmed Zika virus disease cases reported from US states and territories, including Puerto Rico, the US Virgin Islands, and American Samoa. The data from this system can help us understand the effects of postnatal Zika virus infection.
- Data will be used to update recommendations for clinical care, plan for services for pregnant women, their infants

		<p>and families affected by Zika virus, and improve prevention of Zika virus infection during pregnancy.</p>
<p>Slide 69</p>		<ul style="list-style-type: none"> • CDC is rapidly translating new findings into public health action, messages for the public and updated clinical guidance. CDC is committed to sharing what we know when we know it. • To that end, CDC has published updated clinical guidelines for healthcare providers caring for pregnant women, infants, and children with possible Zika virus infection, as well as other guidance relating to children’s well-being such as for schools and camps. These guidelines are available on CDC’s website and are updated as new information becomes available. • In addition, CDC maintains a 24/7 Zika Pregnancy Hotline for healthcare providers of pregnant patients with possible Zika virus infection. Through this service, CDC scientists and clinicians are available for any concerns about clinical management and to answer questions about the US Zika Pregnancy Registry by telephone or email consultation. • Providers and the general public can also ask questions through CDC INFO at 800-CDC-INFO (800-232-4636) or www.cdc.gov/cdc-info.
<p>Slide 70</p>		<ul style="list-style-type: none"> • As I mentioned earlier, CDC is also continuously developing additional guidance tools for healthcare providers. • All these tools are available online.
<p>Slide 71</p>		<ul style="list-style-type: none"> • CDC also has many resources available designed for families, as well as scripts and guides to assist healthcare providers when helping families.

Slide 72

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

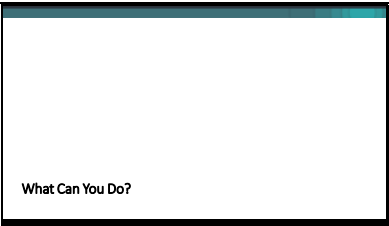
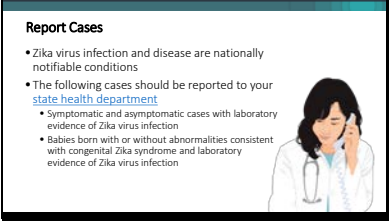
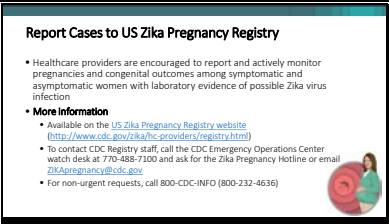
- Information for healthcare professionals caring for patients with Zika
- Links to materials from AAP, ACOG, CDC, and March of Dimes
- Contact information for the CDC Zika Pregnancy Hotline
- Planned expansion to additional jurisdictions in mid-2017
- Planned expansion to include laboratories that can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





ZIKACareconnect
March of Dimes

HelpLine: 1-866-677-0847 (toll-free)
Website: www.zikacareconnect.org

- To facilitate coordination of care for families and help improve access to the necessary services, CDC, in collaboration with McKing Consulting Corporation and March of Dimes, established Zika Care Connect. Zika Care Connect is a program to improve access to specialty healthcare services for the management of Zika virus infection during pregnancy and outcomes in infants caused by Zika.
- Central to the program is a provider network, accessible through a website and HelpLine, that will help connect pregnant women and families to specialists who can provide care.
- The program will be expanded in mid-2017 to include additional jurisdictions and the addition of a web portal with information for clinicians on available laboratory testing.
- The website provides access to the provider network and educational resources.
- The provider network will be searchable on the website by zip code, with additional information so patients can identify providers that meet their specific needs.
- It will help patients establish a medical home by identifying key locations that can provide coordinated care.
- It will also include educational resources for patients and providers, and will link to existing resources developed by CDC and its partners.
- The HelpLine provides access to the provider network and is staffed by professionals who can help with questions and referrals.
- Zika Care Connect is currently enrolling providers in 10 at-risk jurisdictions throughout the US states and territories, with plans for expansion in the near future.
- California, Florida, Georgia, Maryland, New Jersey, New York, Texas, Virginia, Puerto Rico, and US Virgin Islands
- Selection of the 10 states and territories was completed in October 2016.
- The team initially ranked states based on the number of all laboratory-confirmed Zika cases publicly reported on the CDC website.
- We then considered other factors known to contribute to barriers to healthcare access, including population with family origin in Latin America or the Caribbean, size of immigrant population, percent of population with a high school degree, percent below federal poverty level.

<p>Slide 73</p>	 <p>What Can You Do?</p>	<ul style="list-style-type: none"> • Here are some steps that you can take to help:
<p>Slide 74</p>	 <p>Report Cases</p> <ul style="list-style-type: none"> • Zika virus infection and disease are nationally notifiable conditions • The following cases should be reported to your state health department <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • In February 2016, Zika virus disease and congenital Zika virus infections became nationally notifiable conditions in the United States. • Healthcare providers should report laboratory-confirmed and symptomatic (probable) cases of Zika virus to their local, state or territorial health department. • The following cases should be reported to your state health department <ul style="list-style-type: none"> • 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
<p>Slide 75</p>	 <p>Report Cases to US Zika Pregnancy Registry</p> <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Available on the US Zika Pregnancy Registry website (https://www.cdc.gov/zika/health-care-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) 	<ul style="list-style-type: none"> • Also in February 2016, CDC, in collaboration with state, local, tribal, and territorial health departments, launched a comprehensive surveillance system, US Zika Pregnancy Registry, to report and actively monitor pregnancies and congenital outcomes among symptomatic and asymptomatic women with laboratory evidence of possible Zika virus infection • USZPR casts a wider net than ArboNET and National Notifiable Diseases Surveillance System as it pertains to Zika virus, because the registry includes symptomatic and asymptomatic pregnant women with positive, equivocal, or inconclusive Zika virus test results with or without symptoms. It also includes all infants born to these women, not only those with identified congenital infection, and they will be followed for 1 year.

<p>Slide 76</p>	<p>In Summary</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • In summary, here are a few bulleted key takeaways from this presentation: <ul style="list-style-type: none"> • Stay up to date on Zika virus transmission 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 infection among those with symptoms in your community • Understand the assessment and management of Zika virus infection 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 to 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
<p>Slide 77</p>	<p>More Information about Zika Virus</p> <p>More information on caring for pregnant women, infants, or children with Zika virus infection is available at CDC's Zika Virus website.</p>  <p>www.cdc.gov/zika</p>	<ul style="list-style-type: none"> • Additional information and resources can be found on the CDC website.
<p>Slide 78</p>	<p>Thank you!</p> <p>More information on Zika: www.cdc.gov/zika</p> <p><small>For more information, contact CDC 1-800-CDC-1033 (224-1033) TTY: 1-888-232-6348 www.cdc.gov</small></p> <p><small>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.</small></p> 	<ul style="list-style-type: none"> • All of this is the work of many people. Many thanks to all of our collaborators, and thank you all for listening today.

Frequently Asked Questions

How do you define people with possible exposure to Zika?

Possible exposure to Zika is defined as

- Recent travel to areas with risk of Zika
- Living in an area with risk of Zika
- Sexual contact with a partner who traveled to or lived in an area with risk of Zika

What is an area with risk of Zika?

Areas with risk of Zika include both areas with CDC Zika travel notices where local Zika transmission by mosquito has been recently observed, as well as areas where previous Zika transmission by mosquito has been identified but the rate of transmission is unknown at the present time.

What is the cost of testing for Zika virus? Does insurance pay?

The Zika NAT and IgM tests are available through health departments and some commercial laboratories. Prices vary. For information, please contact the commercial lab or health department. Coverage policies vary by health insurance plan.

Are pregnant women prioritized for laboratory testing?

Yes. So that pregnancies affected by Zika virus infection can be prioritized, all laboratory testing requests and results reports for pregnant women should clearly indicate pregnancy status. We are working to incorporate pregnancy status when ordering laboratory testing.

How can clinicians get help with testing?

Healthcare providers should work closely with their state, local, or territorial health department to ensure that the appropriate test is ordered and interpreted correctly. In addition, CDC maintains a 24/7 Zika consultation service for health officials and healthcare providers caring for pregnant women. To contact the service, call 770-488-7100 and ask for the Zika Pregnancy Hotline or email ZIKAMCH@cdc.gov.

Will all pregnant women with Zika virus have a baby with congenital Zika syndrome?

No. Zika virus infection during pregnancy can cause severe brain abnormalities and other birth defects, but not every pregnant woman infected with Zika will have a baby with congenital Zika syndrome. Zika virus infection during pregnancy increases the chances for these problems. Although studies to date have linked Zika virus with certain birth defects or other pregnancy problems, even in places with active Zika virus transmission, women are delivering infants that appear to be healthy.

How should healthcare providers counsel women of reproductive age who want to delay or avoid pregnancy in areas with risk of Zika?

Preventing unintended pregnancy during the Zika virus outbreak is one of the primary strategies to reduce the number of pregnancies affected by Zika virus. Healthcare providers counseling women who want to delay or avoid pregnancy should counsel women on the full range of contraceptive methods and in the context of Zika virus help them to select that most effective method they can use correctly and consistently while recognizing the decision about what type of contraceptive method to use is a personal decision and should be made by the individual or couple in consultation with their healthcare provider.

CDC has [contraceptive guidance for healthcare providers](#) that may be used when counseling patients about contraceptive choice, how to use contraceptive methods, and how to manage problems with contraceptive use. CDC has also developed [teen pregnancy prevention tools](#) for healthcare providers, including ideas to make clinics youth-friendly and recommendations on how to apply CDC's evidence based guidance to their practices.

Healthcare providers should also discuss how to prevent sexual transmission of Zika virus, if the woman or her partner has had possible Zika virus exposure or Zika virus disease, including the correct and consistent use of condoms to protect against sexual transmission of Zika virus.